WOLF CREEK
NUCLEAR OPERATING CORPORATION

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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Subject: Docket No. 50-482: 2003 Annual Radiological Environmental Operating Report

Gentlemen:

Enclosed is the Annual Radiological Environmental Operating Report, which is being submitted pursuant to Wolf Creek Generating Station (WCGS) Technical Specification 5.6.2. This report covers radiological environmental monitoring around WCGS for the period of January 1, 2003, through December 31, 2003.

No commitments are identified in this correspondence. If you have any questions concerning this matter, please contact me at (620) 364-4126, or Mr. William Muilenburg at (620) 364-8831, ext. 4511.

Sincerely,

Kevin J. Moles

KJM/rlg

Enclosure

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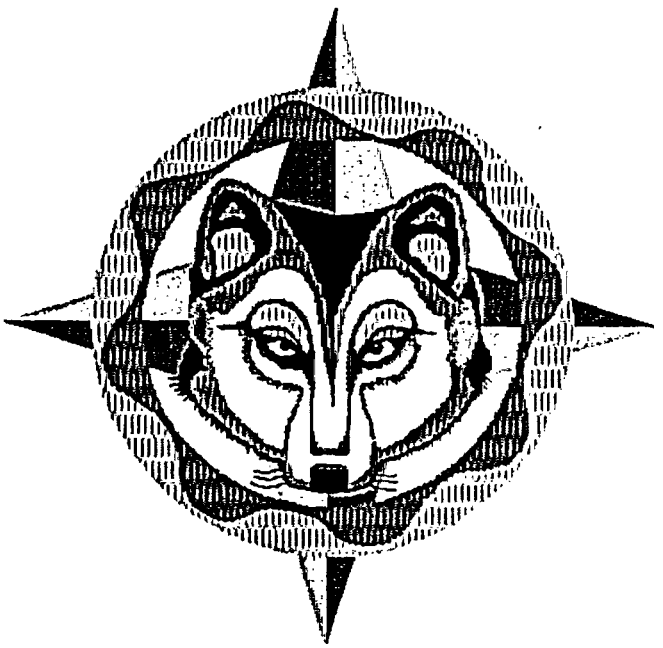
WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION

2003 ANNUAL RADIOLOGICAL

ENVIRONMENTAL OPERATING REPORT



April 15, 2004

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INTRODUCTION

The 2003 Annual Radiological Environmental Operating Report for Wolf Creek Generating Station (WCGS) covers the period from January 1 through December 31, 2003. WCGS is located in Coffey County, Kansas, approximately five miles northeast of Burlington, Kansas.

Fuel loading commenced at WCGS on March 12, 1985. The operational phase of the Radiological Environmental Monitoring Program (REMP) began with initial criticality on May 22, 1985, and the first detectable quantities of radioactivity were reported in plant effluents in June 1985.

This report contains a description of the REMP conducted by Wolf Creek Nuclear Operating Corporation (WCNOC), results of sample analyses, a discussion of monitoring program results, a description of revisions to and deviations from the program, and the results of Interlaboratory Comparison Programs. Individual sample results and a summary of results in the Nuclear Regulatory Commission (NRC) Branch Technical Position specified format are included as appendices.

Plant-related activation, corrosion or fission products were not detected during 2003 in airborne particulate and radioiodine filters, ground water, drinking water, shoreline sediment, broadleaf vegetation, crops, terrestrial vegetation, aquatic vegetation, soil or deer samples. Activation, corrosion or fission products attributable to plant operation were detected during 2003 in surface water, fish, and bottom sediment samples.

Nuclides detected in REMP samples were below applicable NRC reporting levels, and program lower limits of detection were met.

Based upon the radiological environmental monitoring results, it is concluded that station operations has had no significant radiological impact on the health and safety of the public or the environment.

I. PROGRAM DESCRIPTION

Radiological environmental samples were collected according to the schedule in WCGS procedure AP 07B-004, *Offsite Dose Calculation Manual (Radiological Environmental Monitoring Program)*. Environmental samples were collected by the WCGS Environmental Management group and were analyzed by Environmental, Inc. Detroit Edison processed environmental thermoluminescent dosimeters (TLDs) at the Enrico Fermi 2 plant. Table 1 lists sampling pathways and frequencies of sampling and analysis. Table 2 lists each sample location's distance and direction from the plant. Samples in addition to those required by the WCGS Offsite Dose Calculation Manual (ODCM) were also obtained.

The following is a description of the sampling and analysis program by individual pathways.

A. Airborne Pathway

Low volume air sampling pumps collected particulate and radioiodine samples on 47 mm glass fiber filters and charcoal canisters, respectively. The filters and charcoal canisters were changed out weekly, labeled, and shipped to Environmental, Inc. for analysis. The volume of air sampled was calculated from the average of initial and final flow rates and the total time of collection. Each pump was equipped with a time totalizer that was checked weekly against the elapsed time to identify electrical power outages.

Gross beta analysis of the air particulate samples was performed after a nominal 72-hour period to allow the radon and thoron daughter products to decay.

Weekly air particulate filters were combined into quarterly composites for each location and analyzed for gamma emitting isotopes.

Charcoal canisters were routinely counted in groups of five to determine the presence or absence of I-131. Positive indication of I-131 would have resulted in analysis of each individual charcoal canister.

Air samples were collected from six locations. Indicator locations 2, 18 and 37 are located in the three sectors with the highest ground level deposition constants (D/Q). Air sampling stations are also located in the community of New Strawn (indicator location 32) and a control location at Harris (location 48). A control location at Hartford (location 40) was eliminated during the sample year. Distances and directions to sampling locations from the plant are listed in Table 2, indicator locations are shown in Figure 1, and the control locations are shown in Figure 5.

B. Direct Radiation Pathway

Panasonic UD-814-AQ TLDs were used at 48 locations during the sample year. The TLDs consist of one lithium-borate element and three calcium sulfate elements in a plastic case.

TLDs were typically positioned roughly 3 to 4 feet above the ground in plastic thermostat boxes. The thermostat boxes protect the TLDs from the elements and tampering. Two TLDs were placed at each designated location. Indicator TLD sample locations are illustrated in Figure 2 and control locations are shown in Figure 5. Table 2 provides the distance and direction of each location from the plant. Control locations were 39 (Beto Junction), 40 (Hartford) and 48 (Harris).

C. Waterborne Pathway

All water samples were analyzed to determine whether gamma emitters were present. In addition to gamma isotopic analysis, radiochemical analysis for I-131 was performed on drinking water and ground water samples. Gross beta analysis was also performed on drinking water samples. Tritium analysis was performed monthly by liquid scintillation for surface water and quarterly for drinking water. Tritium analysis was also performed quarterly on ground water samples. Water sampling locations are listed in Table 2 and are shown in Figures 3 and 5.

Monthly grab samples of surface water were collected from the outfall of John Redmond Reservoir (JRR) as a control location (location MUSH [Make-Up Screen House]) and from the

discharge cove (DC) of Wolf Creek Lake (WCL) as an indicator location. During the sample year, the control location was moved to JRR (location JRR).

Quarterly grab samples of ground water were collected from five wells. Location B-12 is hydrologically up gradient from the site and was used as a control location. Four locations (C-10, C-49, D-65 and J-1) are hydrologically down gradient from the site and were used as indicator sample locations. During the sample year, location D-65 was eliminated from the program due to sample unavailability. Duplicate samples were obtained from location C-49 and were labeled L-49. These duplicate samples served as laboratory quality checks.

Drinking water was sampled at the water treatment facilities for the towns of Burlington (control location BW-15) and LeRoy (indicator location LW-40). The Burlington facility is located upstream and the LeRoy facility is located downstream of the confluence of the discharge from Wolf Creek Lake and the Neosho River. Composite samples were obtained monthly from automatic samplers at each location that collected approximately 27 ml of drinking water every two hours.

Shoreline sediments were sampled semiannually for gamma analysis at the Wolf Creek Lake discharge cove (DC) indicator location and at the control location (JRR).

D. Ingestion Pathway

Because no sampling locations that produce milk for human consumption were identified within five miles of the plant, milk was not collected during the sample year.

Fish were sampled semiannually from the tail waters of JRR (control, Figure 4) and from Wolf Creek Lake (indicator, Figure 4) for gamma isotopic analysis. Several species of game fish and rough fish were sampled. Gamma isotopic analysis was performed on boneless meat portions of the fish. Fish were also analyzed for tritium.

Broadleaf vegetation samples were collected monthly when available during the growing season from five gardens. Three indicator (G-1, H-1 and N-1) gardens (Figure 4) and two control (D-1 and S-4) gardens (Figure 5) were sampled. Gamma isotopic analyses were performed on all samples.

Crop samples were obtained from two indicator locations (NR-D1 and NR-D2) downstream of the confluence of Wolf Creek and the Neosho River. The samples were irrigated with water from the Neosho River. One crop sample was obtained from control location NR-U1; however, the sample was not irrigated with Neosho River water. Gamma isotopic analysis was performed on each sample. Crop sample locations are identified on Figure 5.

E. Additional Samples Collected (not required by ODCM)

Surface water was collected monthly from the spillway (SP) of Wolf Creek Lake as an indicator location. The water samples were analyzed by gamma isotopic analysis and were also analyzed for tritium. These samples were collected as part of a cooperative sampling effort with the Kansas Department of Health and Environment (KDHE). The sample location is identified on Figure 3.

Drinking water indicator location NF-DW (Neosho Falls) was sampled during the year. The drinking water sample was analyzed for gross beta, gamma emitters and I-131. This sample location was added due to the upcoming closure of the LeRoy drinking water treatment facility and is identified on Figure 5.

Shoreline and bottom sediments were collected for gamma analysis at the Environmental Education Area (EEA) and the Make-up Water Discharge Structure (MUDS). These samples were collected as part of a cooperative sampling effort with the KDHE. The sample locations are identified on Figure 3.

Bottom sediment samples were collected semiannually for gamma analysis at the Wolf Creek Lake discharge cove (DC) indicator location and the control location (JRR). These samples were collected as part of a cooperative sampling effort with the KDHE. The sample locations are identified on Figure 3.

Aquatic vegetation was collected for gamma analysis from indicator location EEA. This sample was collected as part of a cooperative sampling effort with the KDHE. The sample location is identified on Figure 3.

Terrestrial vegetation was sampled from indicator location EEA for gamma isotopic analyses. This sample was collected as part of a cooperative sampling effort with the KDHE. The sample location is identified on Figure 4.

Soil was sampled from indicator locations MUDS and EEA for gamma isotopic analyses. These samples were collected as part of a cooperative sampling effort with the KDHE. The sample locations are identified on Figure 4.

A road-killed deer was sampled from indicator location A2.1 for gamma isotopic analyses. The sample was split with the KDHE. The sample location is identified on Figure 4.

Distance and direction information for the sampling locations listed in this section are outlined in Table 2.

II. DISCUSSION OF RESULTS

Analysis results for all pathways are summarized in Appendix B using the format described in Radiological Assessment Branch Technical Position, Revision 1, November 1979 (NRC Generic Letter 79-065). Results for individual samples are listed in Appendix C.

In this section, results are discussed by pathway and analysis type. Monitoring results are compared with control data, preoperational values, sources of radioactivity, and effluent releases when applicable. Trends or seasonal effects are discussed.

A. Airborne Pathway

Chart 1 graphically illustrates weekly gross beta results for the sample year. Chart 2 represents the historical smoothed averages of indicator and control gross beta data.

Charts 1 and 2 demonstrate how closely the indicator and control locations tracked together. Chart 2 reveals a seasonal cyclic trend in which gross beta values peak in the winter months (December or January) and decrease to a low point in the spring months (May or June). This trend is expected and is attributed to seasonal meteorological changes, i.e., changes in prevailing winds and precipitation.

The gross beta results of 2003 were compared to pre-operational monitoring results of 1983 and 1984. The weekly gross beta analyses range for 1983 and 1984 was 0.0064 to 0.084 pCi/m^3. The 2003 weekly gross beta analyses range for indicator locations was 0.014 to 0.057 pCi/m^3, which was within the 1983 and 1984 pre-operational range. Additionally, the annual mean for indicator locations for 2003 (0.029 pCi/m^3) was lower than the annual mean for 1983 (0.032 pCi/m^3).

The gross beta results for the indicator locations were also compared to the control locations. The annual mean for indicator locations for 2003 (0.029 pCi/m^3) was similar to the annual mean of the control locations (0.028 pCi/m^3).

Naturally occurring Be-7 activity was detected, as was the case during pre-operational monitoring. In 1984, the range for Be-7 detected activity was 0.024 to 0.211 pCi/m^3 for indicator locations, and the annual mean for indicator locations was 0.069 pCi/m^3. In 2003, the range for Be-7 detected activity was 0.044 to 0.084 pCi/m^3 for indicator locations, and the annual mean for indicator locations was 0.071 pCi/m^3.

The control location annual mean for Be-7 detected activity (0.068 pCi/m^3) was similar to the indicator locations annual mean (0.071 pCi/m^3).

Required lower limits of detection were met and I-131 activity was not detected in the weekly analysis of charcoal filters at any location.

No effects of plant operation were seen via the airborne pathway for the year, and no unusual trends were noted.

B. Direct Radiation Pathway

Quarterly gamma exposures measured at each location are shown in Table 3. Measured values have been converted to a standard 90-day quarter.

The annual mean of all indicator locations in 2003 was 0.217 mR/day and the annual mean for the control locations was 0.203 mR/day. These results are similar to the pre-operational results for 1981. In 1981, the annual mean of all indicator locations was 0.21 mR/day and annual mean for the control locations was 0.19 mR/day.

Results from TLDs located near the plant (less than three miles), which would be most affected by changes in plant operation, were combined into quarterly averages. These nearsite averages, using locations 1, 2, 7-14, 18, 26-30, 37 and 38, are compared to control location results (locations 39 and 40) in Chart 3. Chart 3 also includes preoperational data for comparison. The nearsite TLD locations have historically trended higher than the control locations both prior to and after WCGS became operational.

C. Waterborne Pathway

(1) Surface Water

Tritium, attributable to WCGS operation, was detected in all surface water samples collected from Wolf Creek Lake during 2003. An adult drinking 2 liters per day of surface water collected from the Wolf Creek Lake discharge cove, using the annual mean of detected tritium activity (15,627 pCi/liter), would receive a committed effective dose equivalent of 0.713 mRem per year. An adult drinking 2 liters per day of surface water collected from the Wolf Creek Lake discharge cove, using the highest detected tritium activity which was from the sample collected during August (26,793 pCi/liter), would receive a committed effective dose equivalent of 1.223 mRem per year. It should be noted that Wolf Creek Lake is not a drinking water source. Chart 4 illustrates smoothed tritium data for location DC from startup in May 1985 through 2003.

The discharge cove surface water sample collected during August was taken approximately nine hours after a permitted release was made under the Radioactive Effluent Release Program. The curies of liquid tritium discharged during the third quarter of 2003 were approximately twice the amount released during the second quarter of 2003 (1^{st} quarter = 311 Ci; 2^{nd} quarter = 324 Ci; 3^{rd} quarter = 711 Ci; 4^{th} quarter = 152 Ci). The detected tritium activity in September surface water obtained from the discharge cove returned to the expected lower value (16,721 pCi/liter).

It can be seen in Chart 4 that monthly surface water tritium concentrations have trended upward since plant startup. This is expected until the average tritium concentration of the lake reaches equilibrium.

Required lower limits of detection were met and tritium activity was not detected in samples obtained from the control locations (MUSH & JRR).

During pre-operational environmental radiological monitoring, measured radiological activity was not detected in surface water samples.

Tritium was the only activity detected in surface water samples and no unusual trends were noted.

(2) Ground Water

Required lower limits of detection were met and radioactivity was not detected in any ground water samples.

(3) Drinking Water

Chart 5 illustrates the historical drinking water gross beta data and how closely the gross beta results compared for the indicator (LW-40) and control (BW-15) locations.

Gross beta activity was detected in all drinking water samples. The annual mean of the control location gross beta activity (4.8 pCi/liter) was higher than the annual mean of the indicator locations (4.6 pCi/liter). The 2003 annual means of gross beta activity for both the control and indicator locations were lower than those of the pre-operational monitoring year of 1984. In

1984, the annual mean of the control location gross beta activity was 6.4 pCi/liter, and the annual mean of the indicator location gross beta activity was 7.5 pCi/liter.

Required lower limits of detection were met. Tritium activity was not detected in any drinking water samples. Additionally, radionuclides were not detected by the I-131 or gamma isotopic analyses.

Activity due to plant operation was not evident in drinking water samples during 2003 and no unusual trends were noted.

(4) Shoreline Sediment

Naturally occurring K-40 was detected in samples obtained from indicator locations (10,623–11,677 pCi/kg, dry) and in samples obtained from control locations (4,565-11,960 pCi/kg, dry). K-40 was also detected during pre-operational shoreline sediment monitoring.

Cs-137 activity was detected in a shoreline sample obtained from indicator location EEA (144.1 pCi/kg, dry). The Cs-137 concentration measured was below concentrations measured pre-operationally. The pre-operational range for Cs-137 detected activity at location discharge cove was 224 pCi/kg to 437 pCi/kg. The decay corrected pre-operational range is 145.5 to 283.9 pCi/kg. Cs-134 activity has not been detected in shoreline sediment samples, bottom sediment samples or soil samples collected from the EEA sample location. The measured Cs-137 activity was likely due to previous fallout and not to a recently produced fission product associated with plant operation.

Required lower limits of detection were met and Cs-137 activity was not detected in samples obtained at the control location.

Activity due to plant operation was not evident in shoreline sediment samples during 2003 and no unusual trends were noted.

D. Ingestion Pathway

(1) Milk

Milk was not collected during the sample year since no indicator locations within five miles of the plant were identified during the Land Use Census.

(2) Fish

Naturally occurring K-40 activity was detected in all fish samples. K-40 activity was also detected during pre-operational fish monitoring.

During 2003, fish were also analyzed for tritium. All fish samples taken from Wolf Creek Lake had tritium activity detected (8,670.2 pCi/kg annual mean). The detected tritium activity was attributable to plant operation. An adult consuming 21 kilograms of fish, at the maximum measured tritium concentration for 2003 (11,620 pCi/kg), would receive a committed effective dose equivalent of 0.015 mRem.

Tritium activity was not detected in the control samples collected from JRR.

No other radionuclides were detected in fish during the year. The ODCM required lower limits of detection were met and no unusual trends were noted.

(3) Broadleaf Vegetation

Gamma analyses of broadleaf vegetation samples obtained from indicator and control locations detected naturally occurring gamma emitters Be-7 and K-40. Be-7 and K-40 activity was also detected pre-operationally.

The ODCM required lower limits of detection were met and no unusual trends were noted. Activity attributable to plant operation was not detected.

(4) Crop Samples

Gamma analysis detected naturally occurring K-40 to be present in all of the samples. K-40 activity was also detected during pre-operational crop monitoring. K-40 was the only activity detected in crop samples. The ODCM required lower limits of detection were met and no unusual trends were noted.

E. Additional Samples Collected (not required by ODCM)

(1) Bottom Sediment

Naturally occurring K-40 was detected in all of the bottom sediment samples. K-40 activity was also detected during pre-operational bottom sediment monitoring.

Co-60 activity (327.2 and 358.8 pCi/kg) was detected in the samples obtained from the Wolf Creek Lake discharge cove. Co-60 activity was attributable to plant operation and has been identified in plant effluents. Co-60 activity was not detected in pre-operational environmental monitoring and was not detected in samples collected from control location JRR during 2003. Chart 6 plots the Co-60 detected activity from the discharge cove and reflects a decreasing trend.

Cs-137 activity (237.1 and 310.2 pCi/kg) was detected in the indicator samples obtained from the Wolf Creek Lake discharge cove. A portion of this activity is due to fallout and a portion of this activity is likely plant-related since Cs-134 activity has been detected in the past. Cs-137 activity was detected in pre-operational samples, and the results for 2003 indicator bottom sediment samples were within the pre-operational range. (Cs-137 activity detected in 1981 and 1982 was in the range of 79 to 953 pCi/kg. The decay corrected range of pre-operational Cs-137 activity detected is approximately 47 to 572 pCi/kg.) Cs-137 activity has been identified in plant effluents. Cs-137 activity (123.6 and 143.0 pCi/kg) was also detected in the control location samples and in the sample obtained from the indicator location EEA (69.1 pCi/kg).

Chart 7 plots the Cs-137 detected activity from the discharge cove indicator location and JRR control location bottom sediment samples. The detected Cs-137 activity measured from the discharge cove location reflects a decreasing trend. The Chart 7 trend line indicates that as expected, Cs-137 activity detected at the JRR control location has been decreasing.

Cs-134 activity was not detected in 2003 discharge cove bottom sediment samples; however, Chart 8 has been included to display the decreasing trend.

No other radionuclides were detected in bottom sediment samples and no unusual trends were noted.

(2) Aquatic Vegetation

Naturally occurring K-40 activity was detected in samples collected in 2003. K-40 activity was also detected during pre-operational monitoring.

No other radionuclides were detected in aquatic vegetation samples and no unusual trends were noted.

(3) Terrestrial Vegetation

Naturally occurring Be-7 and K-40 activity were detected in the sample obtained from the EEA sample location. No other radionuclides were detected. No unusual trends were identified.

(4) Soil

Naturally occurring K-40 activity was detected in both of the soil samples. K-40 activity was also detected during pre-operational soil monitoring.

Cs-137 (153.7 and 187.9 pCi/kg) activity was detected in the soil samples. The pre-operational Cs-137 results (255 to 2,160 pCi/kg) for soil samples were decay corrected. The decay corrected pre-operational range is approximately 167 to 1415 pCi/kg. The measured Cs-137 activity of the soil samples obtained during 2003 are within or below the decay corrected pre-operational range. Cs-137 activity was not detected in air samples collected during 2003. The measured Cs-137 activity in the soil sample was likely due to previous fallout and not to a recently produced fission product associated with plant operation.

No unusual trends were identified.

5) Deer

Gamma analysis detected naturally occurring K-40 (2,708.1 pCi/kg wet) activity in the deer sample obtained from indicator location A2.1. K-40 activity was also detected during pre-operational monitoring. K-40 was the only activity detected in the deer sample. No unusual trends were noted.

III. ANNUAL LAND USE CENSUS RESULTS

Summary

An annual Land Use Census of rural residents within five miles of WCGS was completed during 2003. The two broadleaf vegetation locations with the highest calculated annual average D/Q rankings were G1.6-QURD1384 and Q2.35-MILA1619. AP 07B-004, Offsite Dose Calculation Manual (Radiological Environmental Monitoring Program) specifies that an "alternate location may be used to provide continued monitoring". The third-ranked garden was at location N2.38-RRDR9. Tables 4 and 5 contain the summarized results and illustrated changes.

Background

Section 5.2, Attachment A, of the ODCM procedure (AP 07B-004), directs that "a Land Use Census shall be conducted annually during the growing season to identify the nearest (1) milk animal, (2) residence, and (3) garden of greater than 500 square feet producing broadleaf vegetation in each of the 16 meteorological sections within five miles of the WCGS site" and "the results of the Land Use Census shall be included in the Annual Radiological Environmental Operating Report."

Table 5-1, Attachment A, of the ODCM (AP 07B-004) requires that broadleaf vegetation samples be collected from two indicator locations with the highest calculated annual average D/Q.

Table 5-1, Attachment A, of the ODCM (AP 07B-004) also requires that milk samples be collected from three indicator locations within five miles of the site having the highest dose potential.

Methodology

One hundred eighty-five surveys were mailed to the rural residents living within five miles of WCGS. A follow-up mailing was sent to residents who did not respond. The survey excluded the residents of New Strawn, Burlington and a trailer park just north of Burlington. These locations were excluded due to the large number of households and the low likelihood that information gained from these residences would affect the locations chosen for REMP sampling. Drive-by information was collected for the nearest residences that did not return surveys.

Results

The information collected was compiled and the results are identified in Table 4. Calculations were performed so that garden locations could be ranked by their respective D/Q. These results are contained in Table 5. It should be noted that relative depositions were recently updated by Engineering (Calculation AN-03-027), which likely contributed to some of the changes in the garden D/Q rankings.

Table 4 reflects the nearest residences, milk animals and broadleaf gardens. Table 5 lists the changes as compared to the 2002 Land Use Census results for milk animals and gardens producing broadleaf vegetation.

Sector Q was the only sector that experienced a change in the nearest residence. There were no changes regarding milk locations. Again, no locations were identified that produced milk for human consumption. Nine location changes were noted for the nearest garden producing broadleaf vegetation.

IV. PROGRAM REVISIONS/CHANGES

A TLD control sample location (location 48) was established in Harris, Kansas. The location was added to provide TLD results at the control air sample location (location 48).

A broadleaf vegetation control sample location (location D-2) was added to the program to allow for an alternate control sample location.

The surface water control location was changed from MUSH to JRR. This change was made for safety reasons and to reduce sample turbidity. Prior to the change, surface water samples were obtained from both locations for six months and the results were compared. Radioactivity was not detected from either sample location. Based upon the comparison, the change would not significantly impact the REMP.

Based upon the results of the 2002 Land Use Census and cooperator participation, the following broadleaf vegetation garden changes for indicator locations were made during 2003:

- Garden locations A-2 and L-1 were deleted from the program
- Garden locations H-1 and N-1 were added to the program

Due to sample unavailability, ground water indicator sample location D-65 was deleted from the program. Ground water indicator sample location J-1 was added to the program.

V. PROGRAM DEVIATIONS

During 2003, no deviations from the AP 07B-004, Offsite Dose Calculation Manual (Radiological Environmental Monitoring Program) sampling schedule occurred.

VI. INTERLABORATORY COMPARISON PROGRAM RESULTS

During 2003, Environmental, Inc. was contracted to perform radiological analysis of environmental samples for WCNOC. The lab participated in the Environmental Resource Associates (ERA) Proficiency Testing Program. Appendix A is the Interlaboratory Comparison Program Results for Environmental, Inc. TLD intercomparison results, in-house spikes, blanks, duplicates and mixed analyte performance evaluation program results are also contained in Appendix A.

Table 6 is a summary of statistical results of performance testing of TLDs processed at Enrico Fermi 2 by Detroit Edison, which participated in the National Voluntary Laboratory Accreditation Program.

VII. COMPARISON TO THE RADIOACTIVE EFFLUENTS RELEASE PROGRAM

As described in the sections discussing radioisotopes found in the surface water from Wolf Creek Lake, dose that may be received as a result of tritium released from WCGS is consistent with the theoretical doses calculated by the Radioactive Effluent Release Program.

Chart 9 indicates that the dose to a man resulting from drinking surface water from Wolf Creek Lake was within a reasonable expected value. Dose for the surface water was determined using the December tritium activity detected for each calendar year at the discharge cove. Released tritium maximum organ dose (mRem) values were obtained from Annual Radioactive Effluent Release Reports and are not cumulative (i.e., the values reflected are the totals for the respective years).

An adult drinking 2 liters per day of surface water collected from the Wolf Creek Lake discharge cove, using the 2003 December detected tritium activity from the discharge cove (16,699 pCi/liter), would receive a committed effective dose equivalent of 0.762 mRem per year. This information was derived from radiological environmental monitoring.

The maximum organ dose for tritium released in liquid effluents in 2003 was 0.211 mRem. This information was obtained from the Annual Radioactive Effluent Release Report.

The tritium dose values are being compared on a qualitative basis. It is not expected that the annual doses, as calculated in the Annual Radioactive Effluent Release Report, would compare directly to those calculated from the REMP. The Annual Radioactive Effluent Release Report provides a 'snap shot' of potential dose resulting from the year's releases. The REMP data indicate the accumulated result of releasing tritium into the cooling lake since the start of plant operation.

VIII. SUPPLIER QUALITY AUDITS OR SURVEILLANCES

Audit 18558 was conducted April 8 to April 11, 2003 on Environmental, Inc. No findings were generated as a result of the audit.

Surveillance 4924-S001 was conducted July 18 to July 19, 2003 on the Fermi 2 dosimetry lab. No findings were generated as a result of the surveillance.

TABLE 1

2003 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM DESCRIPTION (SAMPLE COLLECTION SPECIFIED BY ODCM)

EXPOSURE PATHWAY/ SAMPLE TYPE	NUMBER OF SAMPLES AND SAMPLE LOCATIONS	SAMPLE COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
AIRBORNE	**(See Figures 1 & 5)**		
Radioiodine and Particulates	Samples from five locations	Continuous sampler operation with sample collection weekly, or more frequently if required, by dust loading.	Analyze radioiodine canister weekly for I-131
	Samples from locations near the site boundary in three sectors having the highest calculated annual average D/Q (Locations 2, 18 and 37 on Figure 1)		Analyze particulate filter weekly for gross beta activity; perform quarterly gamma isotopic analysis composite (by location)
	Sample from the vicinity of a community having the highest calculated annual average D/Q (Location 32 on Figure 1, New Strawn)		
	Sample from a control location 9.5 to 18.5 miles distant in the lowest ranked D/Q sector (Location 48 on Figure 5)		

TABLE 1 (Cont.)

EXPOSURE PATHWAY/ SAMPLE TYPE	NUMBER OF SAMPLES AND SAMPLE LOCATIONS	SAMPLE COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
DIRECT RADIATION	**(See Figures 2 & 5)**		
	40 routine monitoring stations with two or more dosimeters measuring dose continuously, placed as follows: An inner ring of stations, one in each meteorological sector 0-3 mile range from the site (Locations 1, 7-9, 11-13, 18, 26, 27, 29-31, 37, 38 and 47 on Figure 2). An outer ring of stations, one in each meteorological sector in the 3-5 mile range from the site (Locations 4-6, 15-17, 19-25, and 33-36 on Figure 2). Five sectors [A, C, D, G, and L] contain an additional station (Locations 2, 3, 10, 14 and 28). The balance of the stations to be placed in special interest areas such as population centers (Locations 23 and 32), nearby residences	Quarterly	Gamma dose quarterly

TABLE 1 (Cont.)

EXPOSURE PATHWAY/ SAMPLE TYPE	NUMBER OF SAMPLES AND SAMPLE LOCATIONS	SAMPLE COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
DIRECT RADIATION (cont.)	(many locations are near a residence), schools (Location 23), and in two or three areas to serve as control stations 10-20 miles distant from the site (Locations 39, 40 and 48 on Figure 5).		
WATERBORNE	(See Figure 3)		
Surface	One sample upstream (Location JRR on Figure 3) and one sample downstream (Location DC on Figure 3).	Monthly grab sample	Monthly gamma isotopic analysis and composite for tritium analysis quarterly
Ground	Samples from one or two sources only if likely to be affected. Indicator samples at locations hydrologically down gradient of the site (Locations C-10, C-49 and J-1 on Figure 3); control sample at a location hydrologically up gradient of the site (Location B-12 on Figure 3).	Quarterly grab sample	Quarterly gamma isotopic and tritium analysis

TABLE 1 (Cont.)

EXPOSURE PATHWAY/ SAMPLE TYPE	NUMBER OF SAMPLES AND SAMPLE LOCATIONS	SAMPLE COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
WATERBORNE (cont.)			
Drinking	Sample of municipal water supply at an indicator location downstream of the site (Location LW-40 on Figure 5); control sample from location upstream of the site (Location BW-15 on Figure 3).	Monthly Composite	Monthly gamma isotopic analysis and gross beta analysis of composite sample. Quarterly tritium analysis of composites.
Shoreline Sediment	One sample from the vicinity of Wolf Creek Lake discharge cove (Location DC on Figure 3); control sample from John Redmond Reservoir (Location JRR on Figure 3).	Semiannually	Semiannual gamma isotopic analysis
INGESTION	(See Figures 4 & 5)		
Milk	Samples from milking animals at three indicator locations within 5 miles of the site having the highest dose potential (currently there are no locations producing milk for human consumption within 5 miles of the site); one sample from a control location greater than 10 miles from the site if indicator locations are sampled.	Semimonthly April to November; monthly December-March	Gamma isotopic analysis and I-131 analysis of each sample

TABLE 1 (Cont.)

EXPOSURE PATHWAY/ SAMPLE TYPE	NUMBER OF SAMPLES AND SAMPLE LOCATIONS	SAMPLE COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
INGESTION (cont.)			
Fish	Indicator samples of 1 to 3 recreationally important species from Wolf Creek Lake; control samples of similar species from John Redmond Reservoir spillway (Figure 4).	Semiannually	Gamma isotopic analysis on edible portions
Broadleaf Vegetation	Samples of available broadleaf vegetation from two indicator locations (using the criteria from the "Land Use Census" section) with highest calculated annual average D/Q (Locations G-1 and N-1 and alternate location H-1 on Figure 4); sample of similar broadleaf vegetation from a control location 9.5 to 18.5 miles distant in the lowest ranked D/Q sector (Location D-1 and alternate location D-2 on Figure 5).	Monthly when available	Gamma isotopic analysis on edible portions
Irrigated Crops	Sample of crops irrigated with water from the Neosho River downstream of the Neosho River - Wolf Creek confluence (Location NR-D1 and NR-D2 on Figure 5).	At time of harvest	Gamma isotopic analysis on edible portions

TABLE 2
SAMPLE LOCATION NUMBERS, DISTANCES (Miles) AND DIRECTIONS

Location Number	Distance/ Direction	Location Number	Distance/ Direction	Location Number	Distance/ Direction
Air Particulates and Radioiodine					
2	2.7/N				
18	3.0/SSE				
32	3.1/WNW				
37	2.0/NNW				
40	15.4/WNW				
48	14.7/ENE				
TLDs					
1	1.4/N	17	3.7/SE	33	3.6/WNW
2	2.7/N	18	3.0/SSE	34	4.0/NW
3	3.1/NE	19	3.9/SSE	35	4.6/NNW
4	4.1/NNE	20	3.3/S	36	4.2/N
5	4.1/NE	21	3.8/S	37	2.0/NNW
6	4.6/ENE	22	3.9/SSW	38	1.2/NW
7	2.1/NE	23	4.3/SW	39	13.1/N
8	1.7/NNE	24	4.1/WSW	40	15.4/WNW
9	2.0/ENE	25	3.4/W	41	0.8/NNW
10	2.4/ENE	26	2.4/WSW	42	0.8/SSE
11	1.7/E	27	2.2/SW	43	0.7/WNW
12	1.9/ESE	28	2.6/SW	44	3.0/NNW
13	1.6/SE	29	2.7/SSW	46	1.6/WNW
14	2.5/SE	30	2.5/W	47	0.16/S
15	4.6/ESE	31	3.0/WNW	48	14.7/ENE
16	4.3/E	32	3.1/WNW	49	0.8/NNE
Ground water		Drinking water		Surface water	
B-12	1.9/NNE	BW-15	3.9/SW	DC	0.6/WNW
C-10	2.7/WSW	LW-40	11.3/SSE	JRR	3.7/W
C-49/L-49	2.8/SW	NF-DW	17.5/SSE	MUSH	3.6/W
D-65	3.9/S			SP	3.2/SSE
J-1	3.8/S				
Deer		Broadleaf vegetation		Crops	
A2.1	2.1/N	D-1	14.7/ENE	NR-D1	8.9/S
Terrestrial Vegetation		G-1	1.6/SE	NR-D2	11.5/S
EEA	3.0/NNW	H-1	3.3/SSE	NR-U1	4.0/SSW
		N-1	2.4/W		
		S-4	15.4/WNW		
Fish		Shoreline Sediment		Aquatic Vegetation	
WCL	0.6/WNW	DC	0.8/WNW	EEA	3.0/NNW
JRR	3.7/W	EEA	3.0/NNW	Bottom Sediment	
Soil		JRR	3.6/W	DC	0.9/WNW
EEA	3.0/NNW	MUDS	1.5/WNW	EEA	3.0/NNW
MUDS	1.5/WNW			JRR	3.7/W
				MUDS	1.5/WNW

TABLE 3
TLD Results
(mR/90-day qtr.)

Location	Qtr. 1 90-Day Avg.	Qtr. 1 2-std. dev.	Qtr. 2 90-Day Avg.	Qtr. 2 2-std. dev.	Qtr. 3 90-Day Avg.	Qtr. 3 2-std. dev.	Qtr. 4 90-Day Avg.	Qtr. 4 2-std. dev.
1	23.4	2.5	21.4	1.3	20.6	2.8	21.0	0.7
2	20.6	1.3	20.5	1.3	16.9	0.9	19.7	1.3
3	21.9	1.3	19.8	1.1	17.4	1.1	20.6	1.3
4	23.4	1.5	20.2	0.7	17.8	0.8	20.4	0.9
5	19.3	1.4	20.1	2.7	16.7	1.6	18.9	1.3
6	19.8	1.1	19.9	2.0	16.0	1.4	19.0	0.9
7	19.9	1.1	20.1	1.0	16.7	0.7	19.2	0.8
8	21.5	1.4	22.9	1.0	17.9	1.4	21.1	1.3
9	19.1	1.2	18.8	1.4	16.4	0.4	18.1	1.0
10	21.1	1.4	20.6	2.0	17.6	0.9	20.9	1.4
11	22.0	2.2	21.6	0.6	19.9	2.7	22.0	1.3
12	20.8	0.6	20.2	1.6	17.8	1.2	20.5	1.2
13	22.5	1.0	21.2	0.6	18.7	1.3	20.9	0.8
14	21.5	1.2	20.5	0.8	17.8	1.0	20.9	1.1
15	22.9	4.2	20.1	0.7	17.7	1.6	19.9	1.2
16	21.2	1.3	19.8	1.4	16.4	0.8	19.3	1.0
17	21.8	1.4	19.2	1.2	17.0	0.6	21.7	3.4
18	20.3	1.4	19.3	1.2	17.2	1.7	21.6	3.0
19	22.4	1.9	21.1	1.4	18.4	1.9	22.5	0.8
20	21.0	1.1	19.7	0.6	18.1	0.8	20.6	1.4
21	18.5	1.4	17.9	0.9	14.9	1.3	18.3	2.1
22	21.4	1.9	21.4	1.8	20.6	0.8	22.4	1.0
23	20.6	1.2	20.3	0.9	17.5	1.9	20.8	2.1
24	21.0	1.1	19.8	1.3	17.4	1.5	20.6	1.3
25	20.9	2.6	18.7	1.6	16.8	3.2	17.8	1.4
26	22.0	3.2	18.8	1.1	16.1	0.4	18.6	1.1
27	21.0	1.2	19.3	1.8	17.8	0.9	20.4	1.2
28	19.6	1.4	16.8	1.5	15.2	1.0	17.9	1.2
29	20.1	2.9	15.9	0.5	14.4	1.9	17.0	0.9
30	21.6	1.0	20.3	0.6	18.7	1.8	20.5	1.1
31	21.1	1.8	18.5	0.6	16.9	1.5	19.9	1.1
32	19.2	1.0	18.7	0.9	16.4	1.1	21.0	3.6
33	24.0	4.9	20.0	1.0	18.2	0.9	21.2	1.6
34	23.1	2.1	20.9	1.1	18.5	1.2	22.4	2.8
35	22.2	1.3	20.6	1.1	18.0	1.1	20.8	1.7
36	21.5	3.4	20.6	1.6	18.5	1.8	20.1	1.6
37	22.3	1.8	19.1	1.3	17.2	1.1	18.8	1.2
38	23.1	2.4	20.8	0.8	19.4	1.6	20.7	1.2
39	20.0	1.5	18.9	1.9	17.2	1.4	19.1	0.8
40	19.7	2.5	17.0	0.7	14.6	0.9	18.7	1.2
41	22.3	3.6	20.5	1.0	18.3	1.1	21.3	1.5
42	15.5	1.5	16.2	3.5	13.1	1.3	14.4	0.5
43	16.5	4.2	13.9	0.9	11.4	0.8	13.7	0.8
44	21.3	1.9	21.5	4.1	19.8	2.9	19.9	1.6
46	22.0	3.9	18.5	1.8	18.6	0.8	19.8	1.4
47	23.1	1.4	20.0	1.6	18.4	1.8	22.6	1.6
48	20.2	1.7	18.8	1.0	16.5	0.7	18.7	1.0
49							15.9	1.3

TABLE 3 (Cont.)
TLD Results
Total Annual Exposure (mR)

Location	mR
1	86.4
2	77.7
3	79.7
4	81.8
5	75.0
6	74.7
7	75.9
8	83.4
9	72.4
10	80.2
11	85.5
12	79.3
13	83.3
14	80.7
15	80.6
16	76.7
17	79.7
18	78.4
19	84.4
20	79.4
21	69.6
22	85.8
23	79.2
24	78.8
25	74.2
26	75.5
27	78.5
28	69.5
29	67.4
30	81.1
31	76.4
32	75.3
33	83.4
34	84.9
35	81.6
36	80.7
37	77.4
38	84.0
39	75.2
40	70.0
41	82.4
42	59.2
43	55.5
44	82.5
46	78.9
47	84.1
48	74.2

TABLE 4
2003 Land Use Census Data

Location of Nearest:

Sector	Residence	Milking Animals	Broadleaf Garden
A	A2.60-17TE1520	None	None
B	B3.53-QURD1755	None	None
C	C1.92-16RD1655	None	C1.92-16RD1655
D	D2.03-QULA1571	None	D3.00-16RD1829
E	E1.77-QULA1485	None	None
F	F1.57-14RD1711	None	F2.44-RERD1391
G	G1.56-QURD1384	None	G1.56-QURD1384
H	H3.09-12RD1711	None	H3.30-QURD1175
J	J3.70-11RD1540	None	J3.84-11RD1499
K	K2.70-12LA1439	None	K4.10-NARD1120
L	L2.10-NARD1339	None	L2.39-NARD1309
M	M2.47-14RD1322	None	M2.49-14RD1321
N	N1.71-NARD1441	None	N2.38-RRDR9
P	P2.76-HW751534	None	P4.90-DEST342
Q	Q2.35-MILA1619	None	Q2.35-MILA1619
R	R2.08-NALN1650	None	None

Locations are identified based upon the following protocol:
EXAMPLE: A1.40-16RD1525

First letter is based upon sector, thus "A" designates this residence is in sector A.

The number immediately following the first letter designates the distance (in miles) from the reactor.

The characters following the dash represent a unique identifier based upon location address.

The example is in sector A, 1.40 miles from the reactor, at 1525 16th Road.

TABLE 5
Comparison of 2002 and 2003 Land Use Census Milk and Garden Data

SECTOR	2002 MILKING ANIMALS	2003 MILKING ANIMALS	2002 CLOSEST GARDEN PRODUCING BROADLEAF VEGETATION	2003 CLOSEST GARDEN PRODUCING BROADLEAF VEGETATION	D/Q RANKING
A	None	None	A4.91-OXRD1940	None	
B	None	None	B3.53-QURD1755	None	
C	None	None	C3.58-RERD1675	C1.92-16RD1655	4
D	None	None	D3.10-16RD1829	D3.00-16RD1829	11
E	None	None	E4.40-TRRD1551	None	
F	None	None	F2.44-RERD1391	F2.44-RERD1391	8
G	None	None	G1.56-QURD1384	G1.56-QURD1384	1
H	None	None	H3.30-QURD1175	H3.30-QURD1175	6
J	None	None	J3.80-11RD1535	J3.84-11RD1499	9
K	None	None	K4.1-NARD1120	K4.10-NARD1120	10
L	None	None	L2.83-NARD1250	L2.39-NARD1309	5
M	None	None	M3.00-13LA1290	M2.49-14RD1321	7
N	None	None	N2.38-RRDR9	N2.38-RRDR9	3
P	None	None	P4.70-KARD1675	P4.90-DEST342	12
Q	None	None	None	Q2.35-MILA1619	2
R	None	None	None	None	

NOTE: Entries underlined indicate changes from the 2002 Land Use Census.

TABLE 6
Dosimetry Performance Testing Results

NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM
PERSONNEL DOSIMETRY PERFORMANCE TESTING
SUMMARY OF STATISTICAL RESULTS

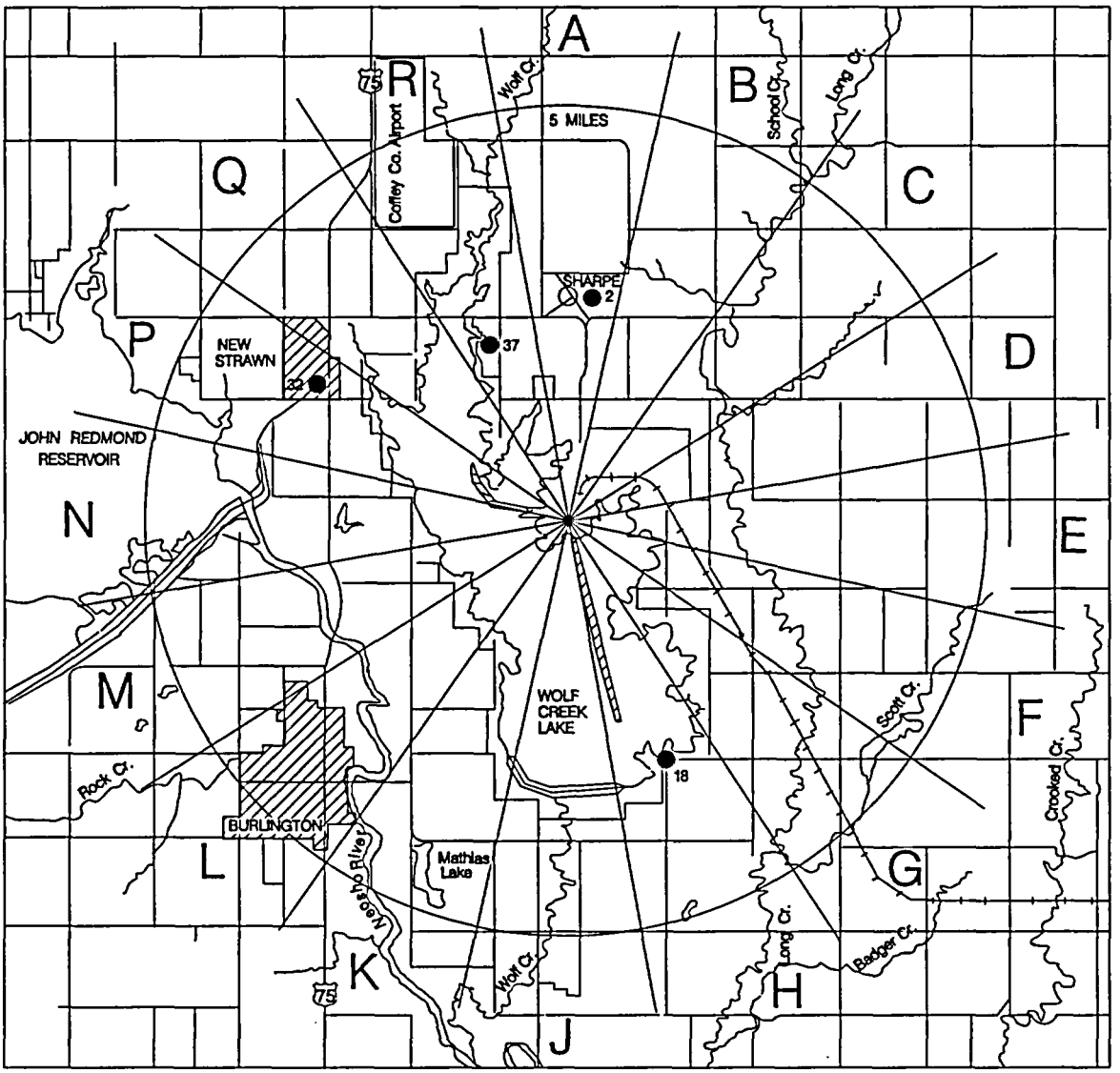
PROCESSOR NAME:	DETROIT EDISON COMPANY
PROCESSOR CODE:	100529 B
DOSIMETER DESCRIPTION:	PANASONIC UD-802AS/ISA 820
TEST RESULTS FOR QUARTER:	200204
TESTING STATUS:	RENEWAL
TYPE OF DOSIMETER:	WHOLE BODY
REPORT PRINTED:	16 January 2003

	SHALLOW DEPTH				DEEP DEPTH			
CATEGORY	B	S	|B| + S	L	B	S	|B| + S	L
IA	NOT TESTED				-0.006	0.046	0.052	0.30
IB	NOT TESTED				NOT TESTED			
IC	NOT TESTED				NOT TESTED			
IIA	-0.076	0.053	0.129	0.40	-0.048	0.082	0.130	0.40
IIB	NOT TESTED				NOT TESTED			
IIC	NOT TESTED				NOT TESTED			
IID	NOT TESTED				NOT TESTED			
IIIA	-0.027	0.090	0.117	0.40	NOT TESTED			
IIIB	NOT TESTED				NOT TESTED			
IIIC	NOT TESTED				NOT TESTED			
IVA	0.011	0.056	0.067	0.40	0.017	0.081	0.098	0.40
IVB	NOT TESTED				NOT TESTED			
IVC	NOT TESTED				NOT TESTED			
V	-0.044	0.107	0.151	0.40	0.002	0.148	0.149	0.40
VI-TOTAL	NOT TESTED				-0.033	0.041	0.074	0.40
VI-NEUTRON	NOT TESTED				0.016	0.181	0.197	0.40

B = Bias S = Standard Deviation L = Limit

The laboratory successfully completed ANSI N13.11(2001)/NVLAP testing in categories IA, IIA, IIIA, IVA, VA and VIC.

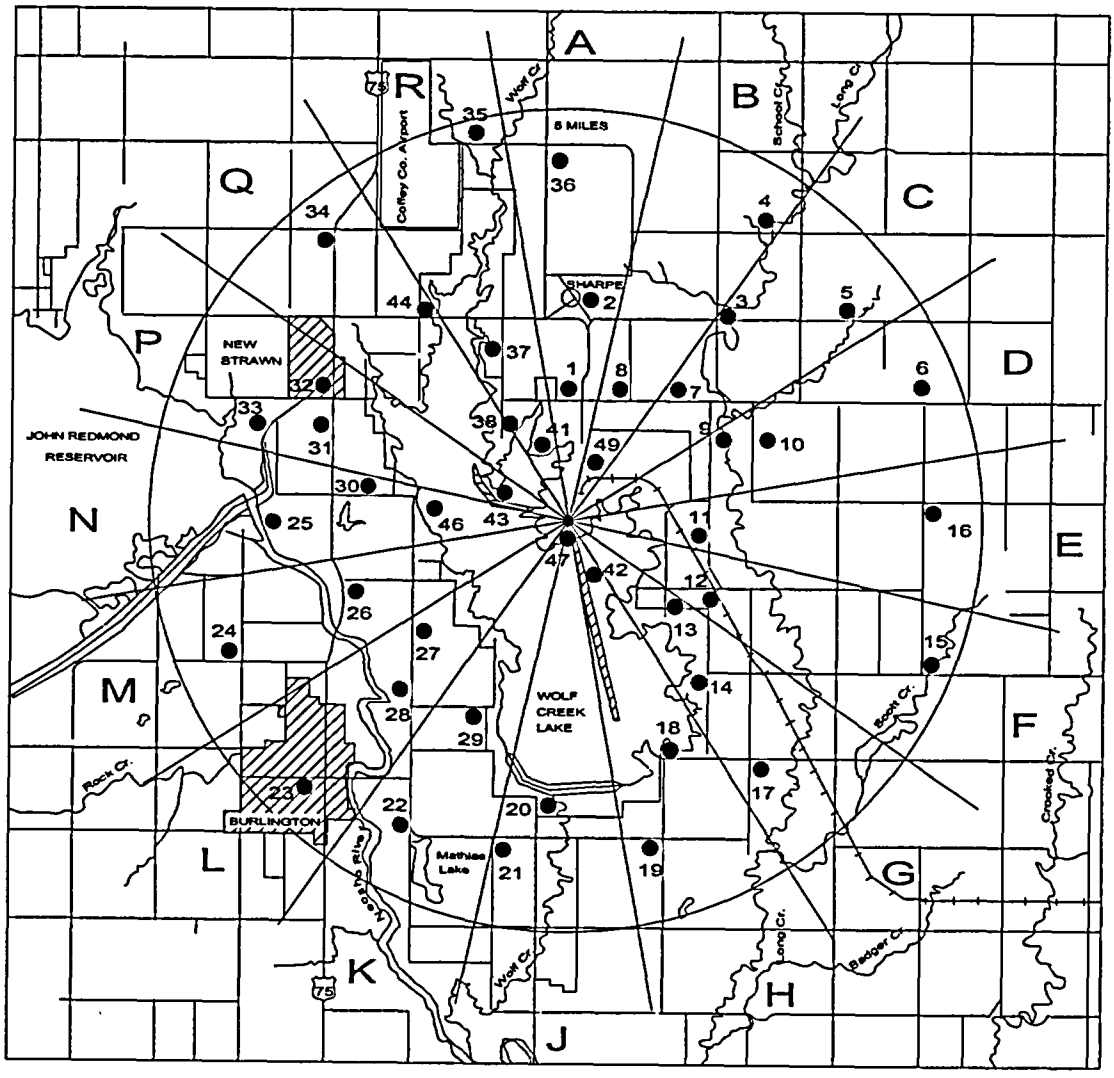
FIGURE 1



AIRBORNE PATHWAY SAMPLING LOCATIONS

● = AIRBORNE PARTICULATE AND RADIOIODINE

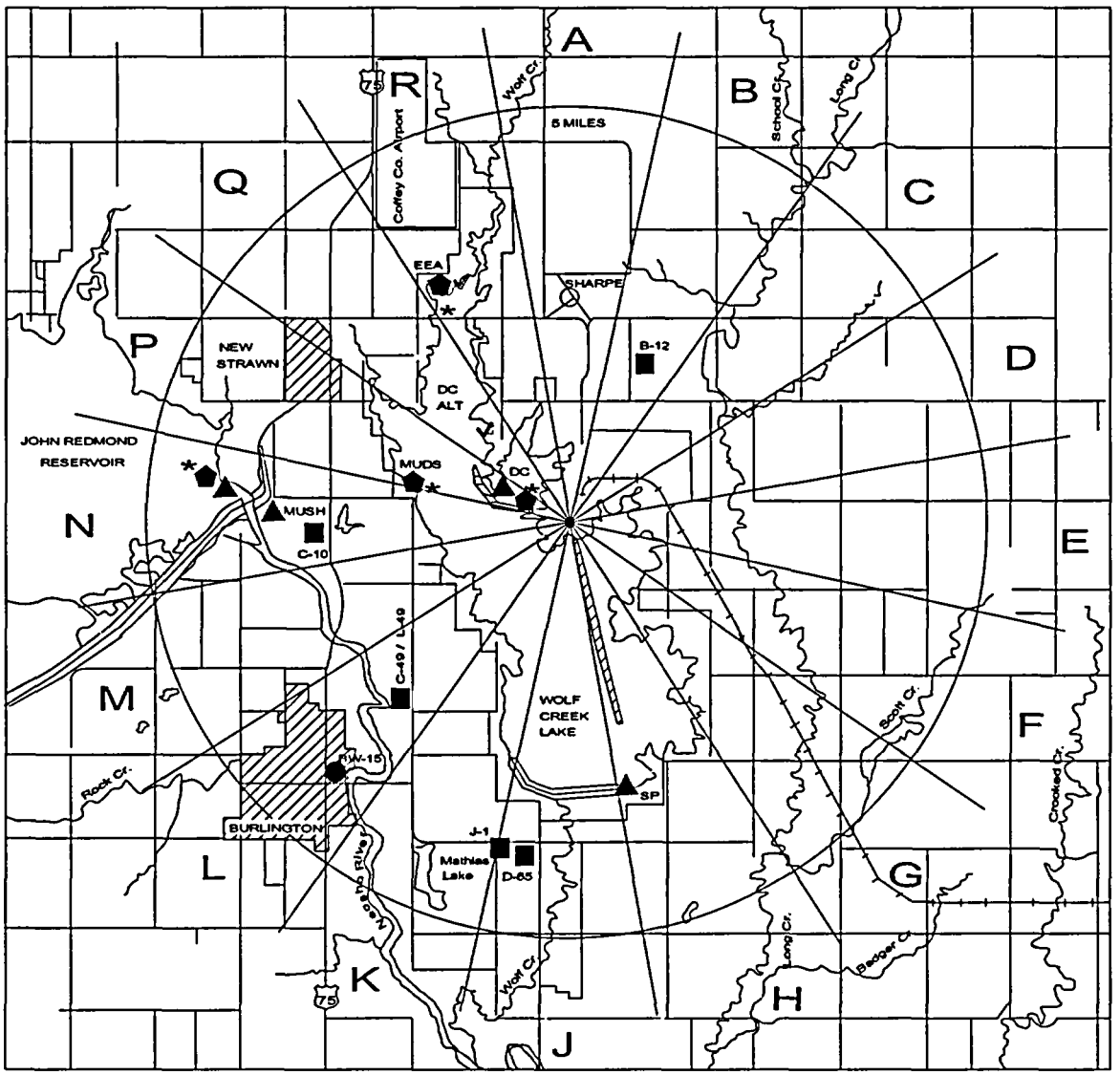
FIGURE 2



DIRECT RADIATION PATHWAY SAMPLING LOCATIONS

● = TLD LOCATIONS

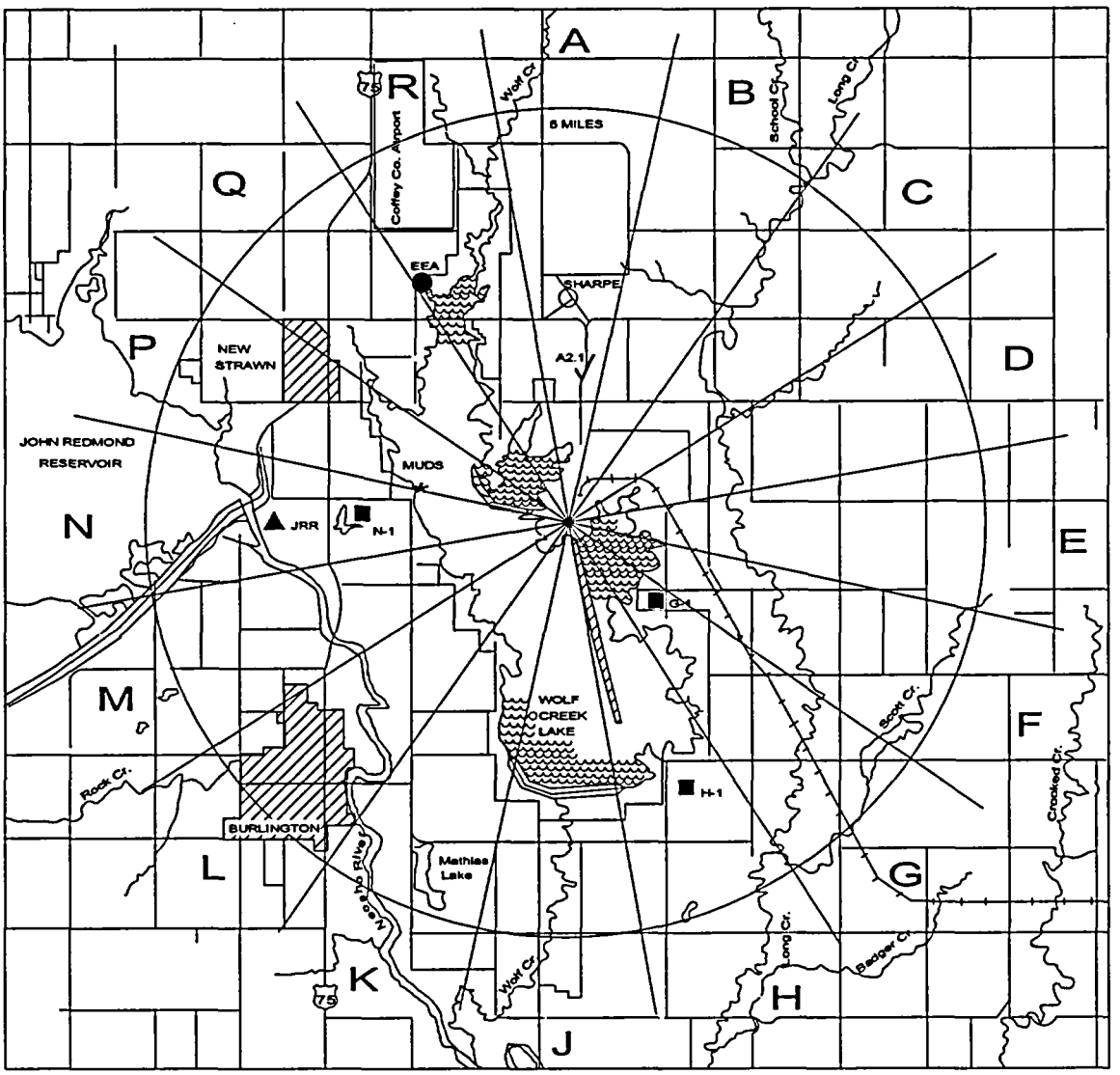
FIGURE 3



WATERBORNE PATHWAY SAMPLING LOCATIONS

● = DRINKING WATER
▲ = SURFACE WATER
■ = GROUND WATER
⬟ = SHORELINE SEDIMENT
* = BOTTOM SEDIMENT
✓ = AQUATIC VEGETATION / ALGAE

FIGURE 4



INGESTION PATHWAY SAMPLING LOCATIONS

▲ = FISH (JRR)

■ = BROADLEAF VEGETATION

= FISH (WCL)

● = TERRESTRIAL VEGETATION AND SOIL

* = SOIL

√ = DEER

FIGURE 5

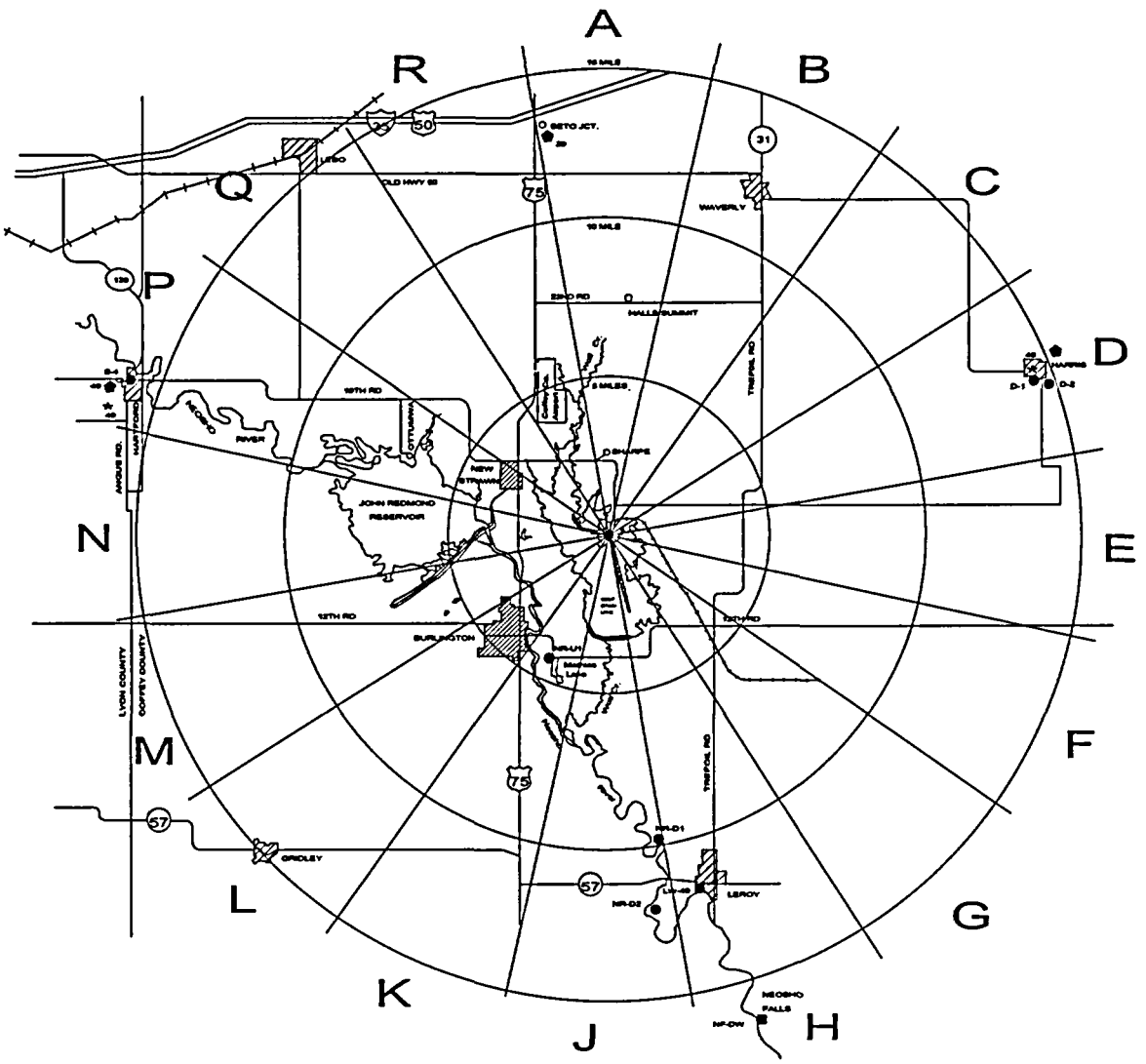

A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R
DISTANT SAMPLING LOCATIONS
= TLD
= AIRBORNE PARTICULATE & RADIOIODINE
= DRINKING WATER
= BROADLEAF VEGETATION/ IRRIGATED CROPS

CHART 1

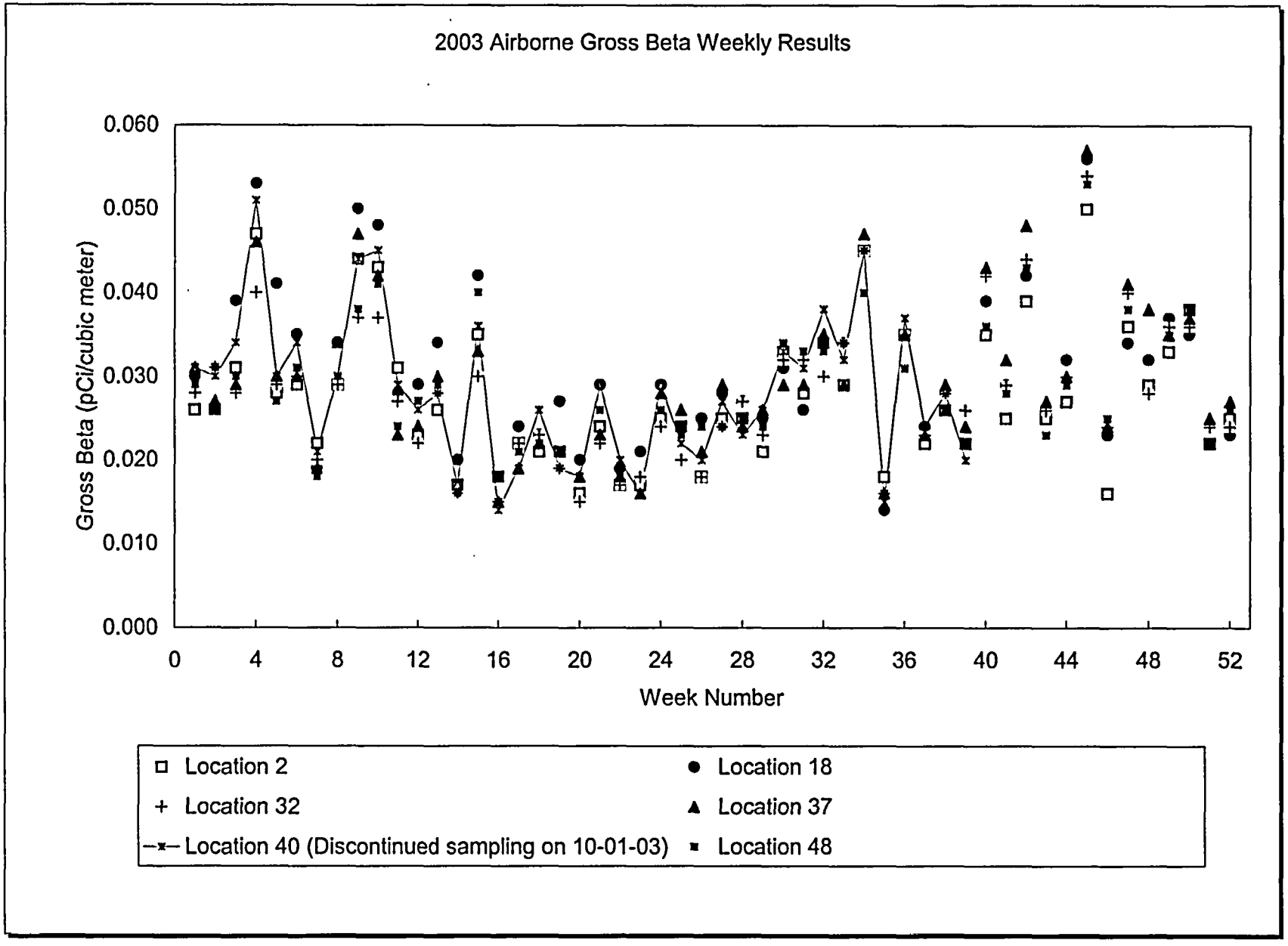

2003 Airborne Gross Beta Weekly Results
Gross Beta (pCi/cubic meter)
0.060
0.050
0.040
0.030
0.020
0.010
0.000
0
4
8
12
16
20
24
28
32
36
40
44
48
52
Week Number
Location 2
Location 18
Location 32
Location 37
Location 40 (Discontinued sampling on 10-01-03)
Location 48

CHART 2

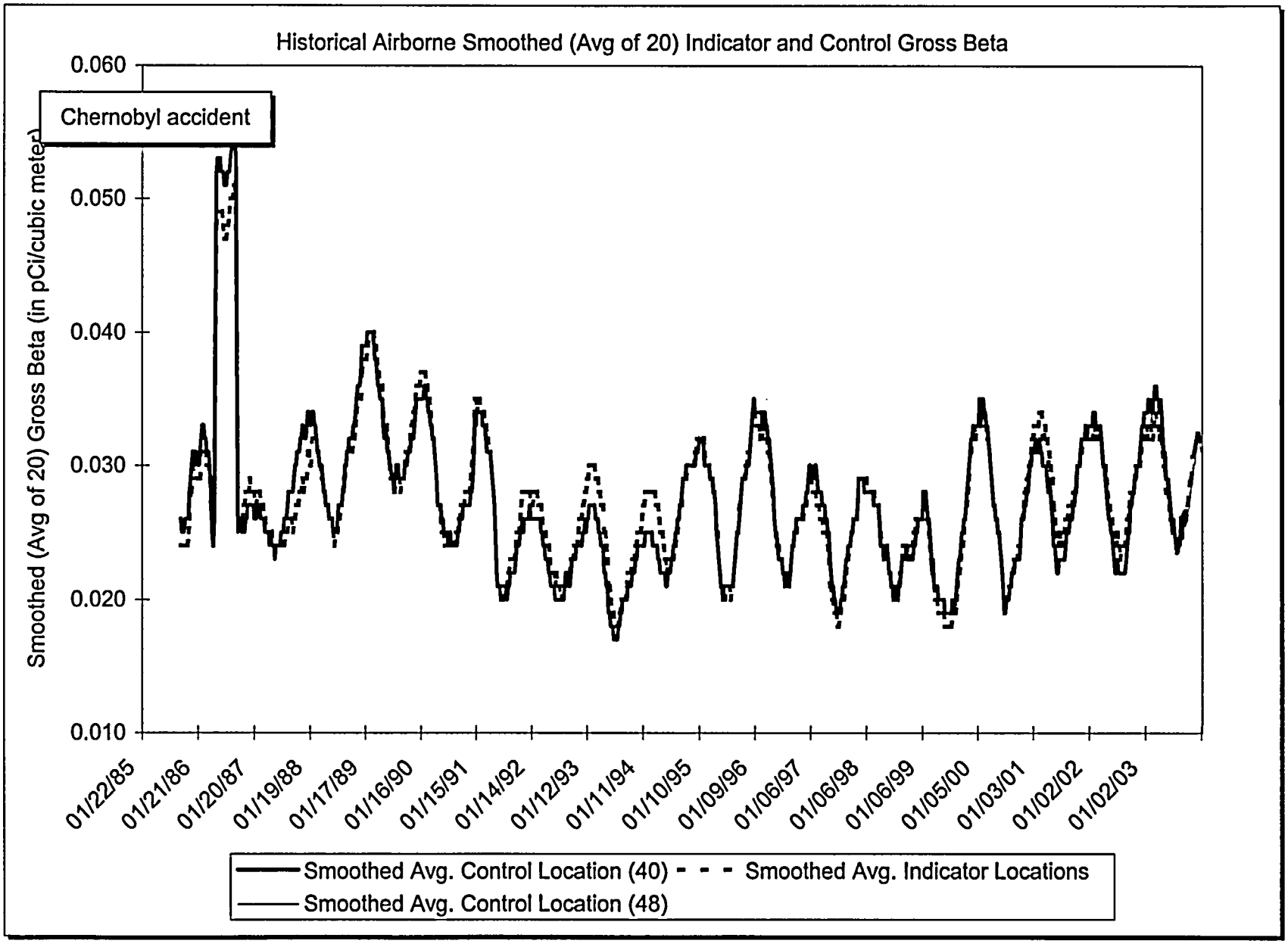

Historical Airborne Smoothed (Avg of 20) Indicator and Control Gross Beta
Chernobyl accident
Smoothed (Avg of 20) Gross Beta (in pCi/cubic meter)
0.060
0.050
0.040
0.030
0.020
0.010
01/22/85
01/21/86
01/20/87
01/19/88
01/17/89
01/16/90
01/15/91
01/14/92
01/12/93
01/11/94
01/10/95
01/09/96
01/06/97
01/06/98
01/06/99
01/05/00
01/03/01
01/02/02
01/02/03
Smoothed Avg. Control Location (40)
Smoothed Avg. Indicator Locations
Smoothed Avg. Control Location (48)

CHART 3

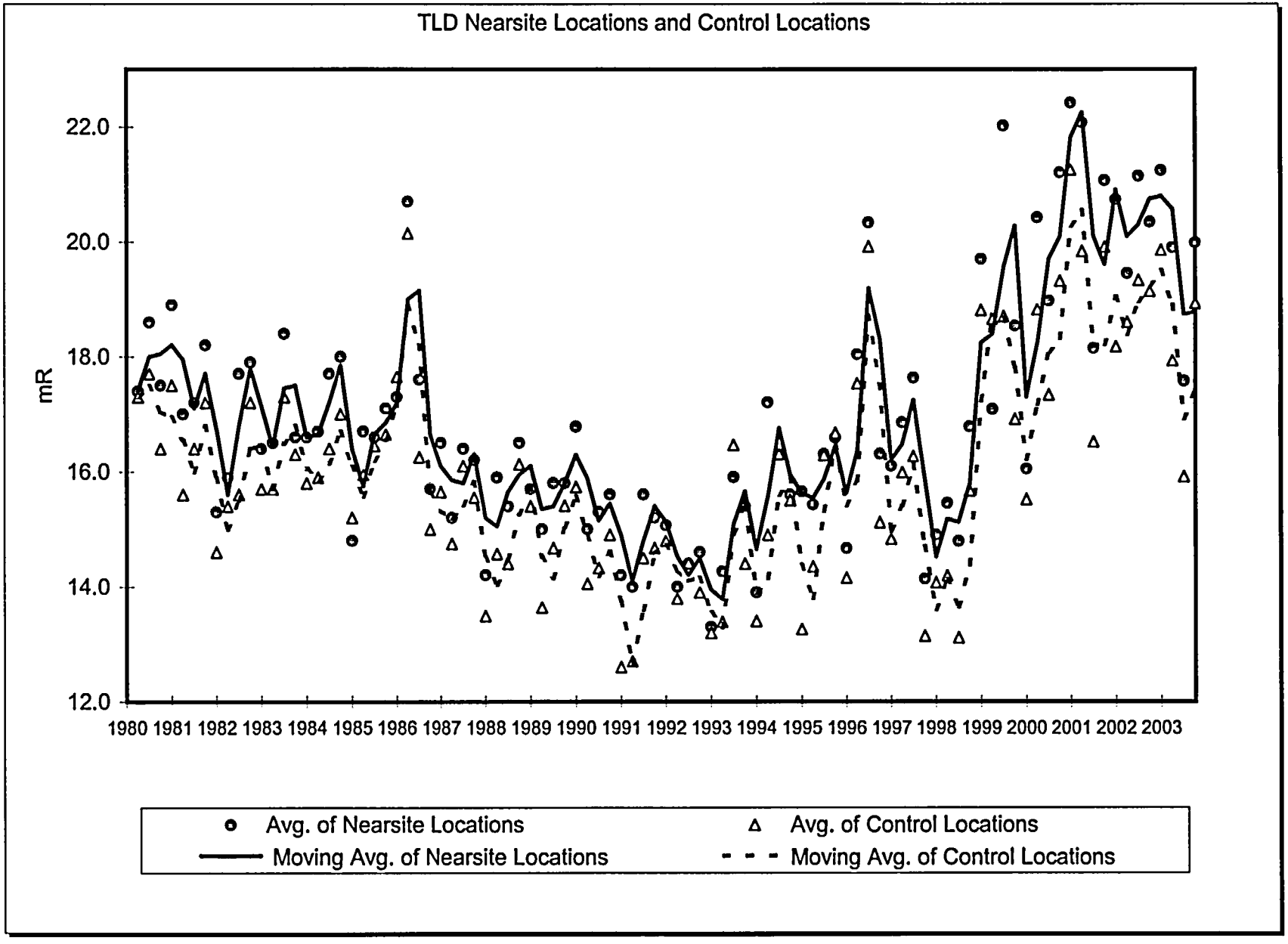

TLD Nearsite Locations and Control Locations
mR
22.0
20.0
18.0
16.0
14.0
12.0
1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003
Avg. of Nearsite Locations
Avg. of Control Locations
Moving Avg. of Nearsite Locations
Moving Avg. of Control Locations

CHART 4

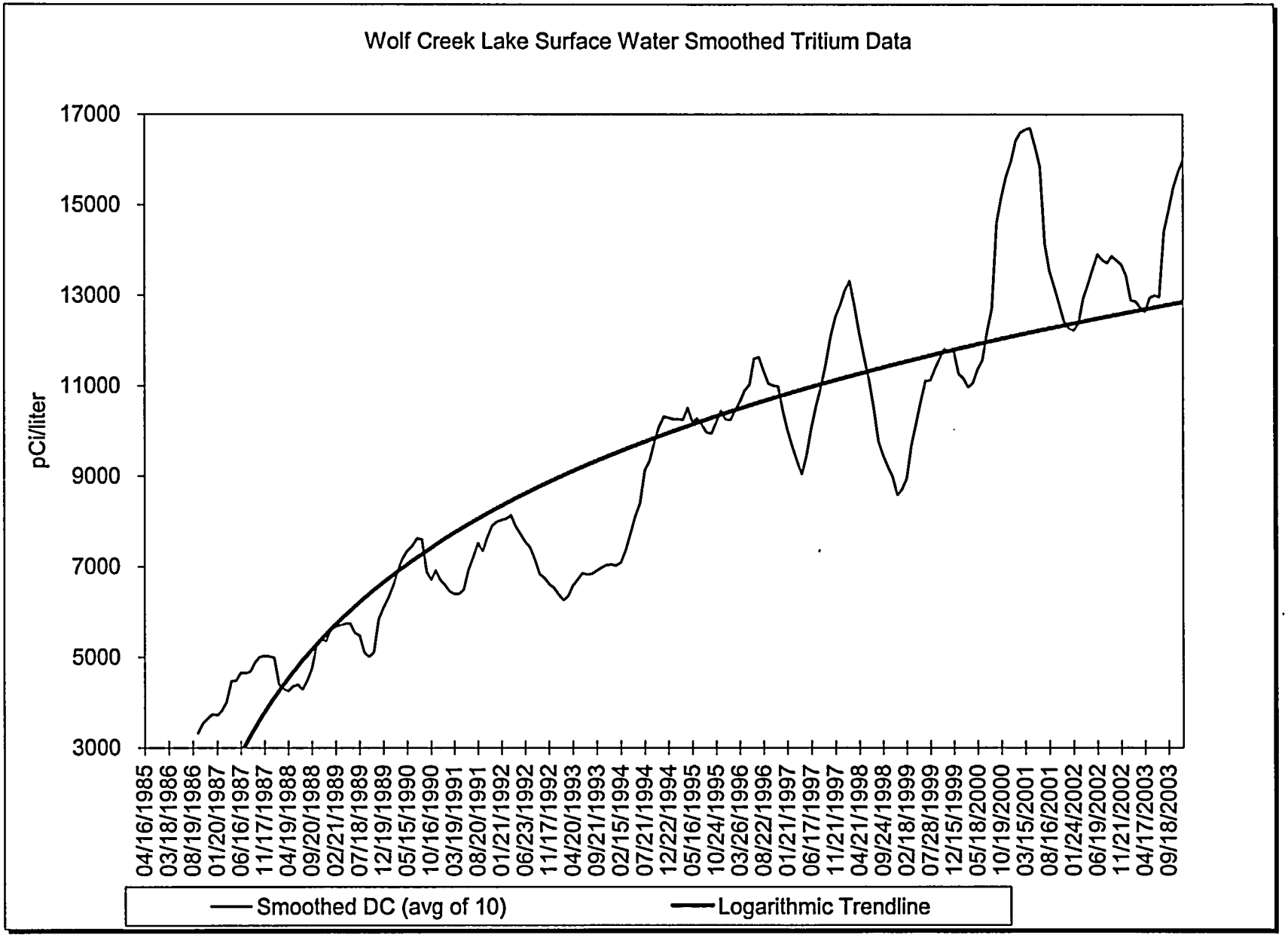

Wolf Creek Lake Surface Water Smoothed Tritium Data
pCi/liter
17000
15000
13000
11000
9000
7000
5000
3000
04/16/1985
03/18/1986
08/19/1986
01/20/1987
06/16/1987
11/17/1987
04/19/1988
09/20/1988
02/21/1989
07/18/1989
12/19/1989
05/15/1990
10/16/1990
03/19/1991
08/20/1991
01/21/1992
06/23/1992
11/17/1992
04/20/1993
09/21/1993
02/15/1994
07/21/1994
12/22/1994
05/16/1995
10/24/1995
03/26/1996
08/22/1996
01/21/1997
06/17/1997
11/21/1997
04/21/1998
09/24/1998
02/18/1999
07/28/1999
12/15/1999
05/18/2000
10/19/2000
03/15/2001
08/16/2001
01/24/2002
06/19/2002
11/21/2002
04/17/2003
09/18/2003
Smoothed DC (avg of 10)
Logarithmic Trendline

CHART 5

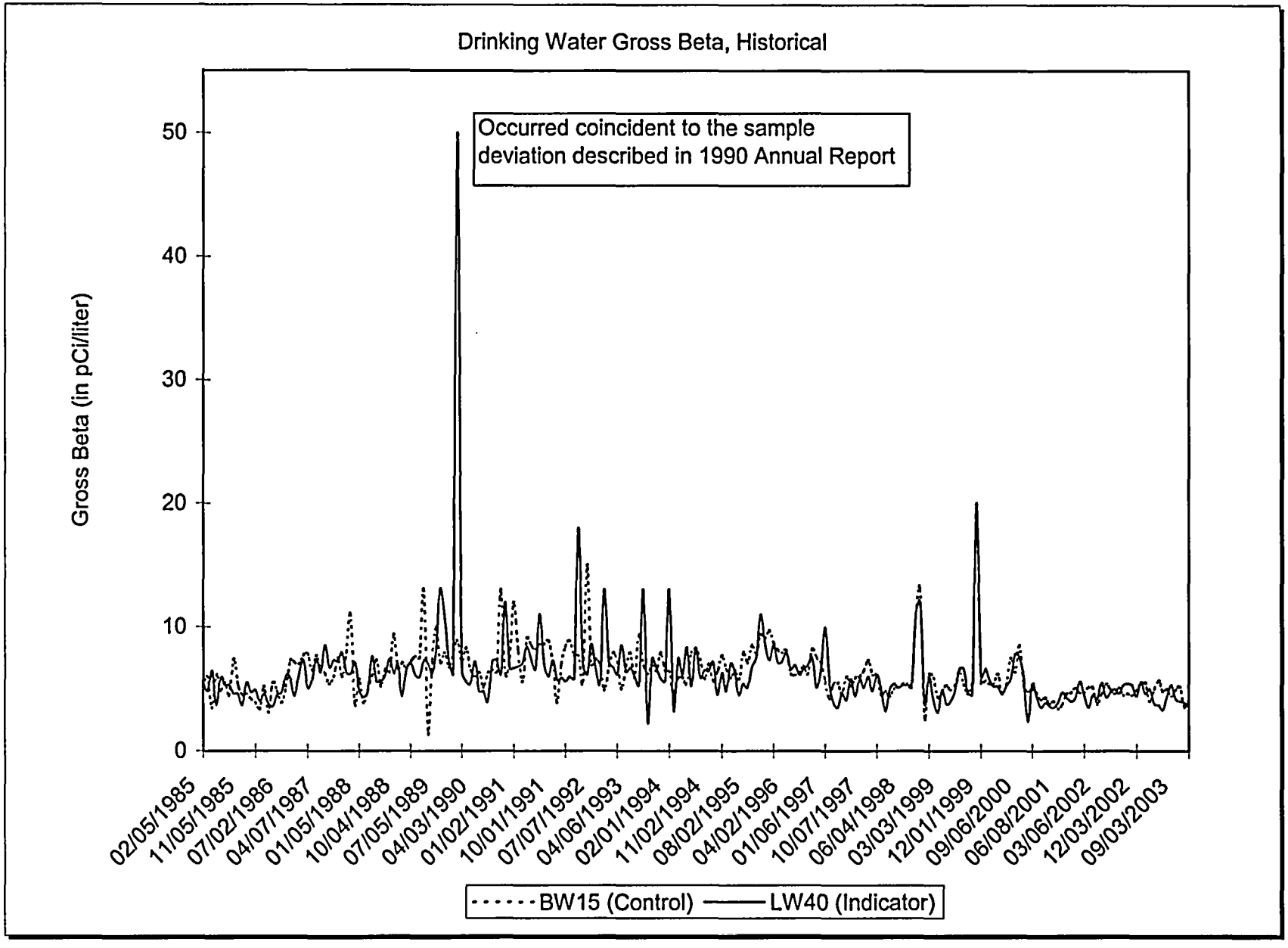

Drinking Water Gross Beta, Historical
Occurred coincident to the sample deviation described in 1990 Annual Report
Gross Beta (in pCi/liter)
50
40
30
20
10
0
02/05/1985
11/05/1985
07/02/1986
04/07/1987
01/05/1988
10/04/1988
07/05/1989
04/03/1990
01/02/1991
10/01/1991
07/07/1992
04/06/1993
02/01/1994
11/02/1994
08/02/1995
04/02/1996
01/06/1997
10/07/1997
06/04/1998
03/03/1999
12/01/1999
09/06/2000
06/08/2001
03/06/2002
12/03/2002
09/03/2003
BW15 (Control)
LW40 (Indicator)

CHART 6

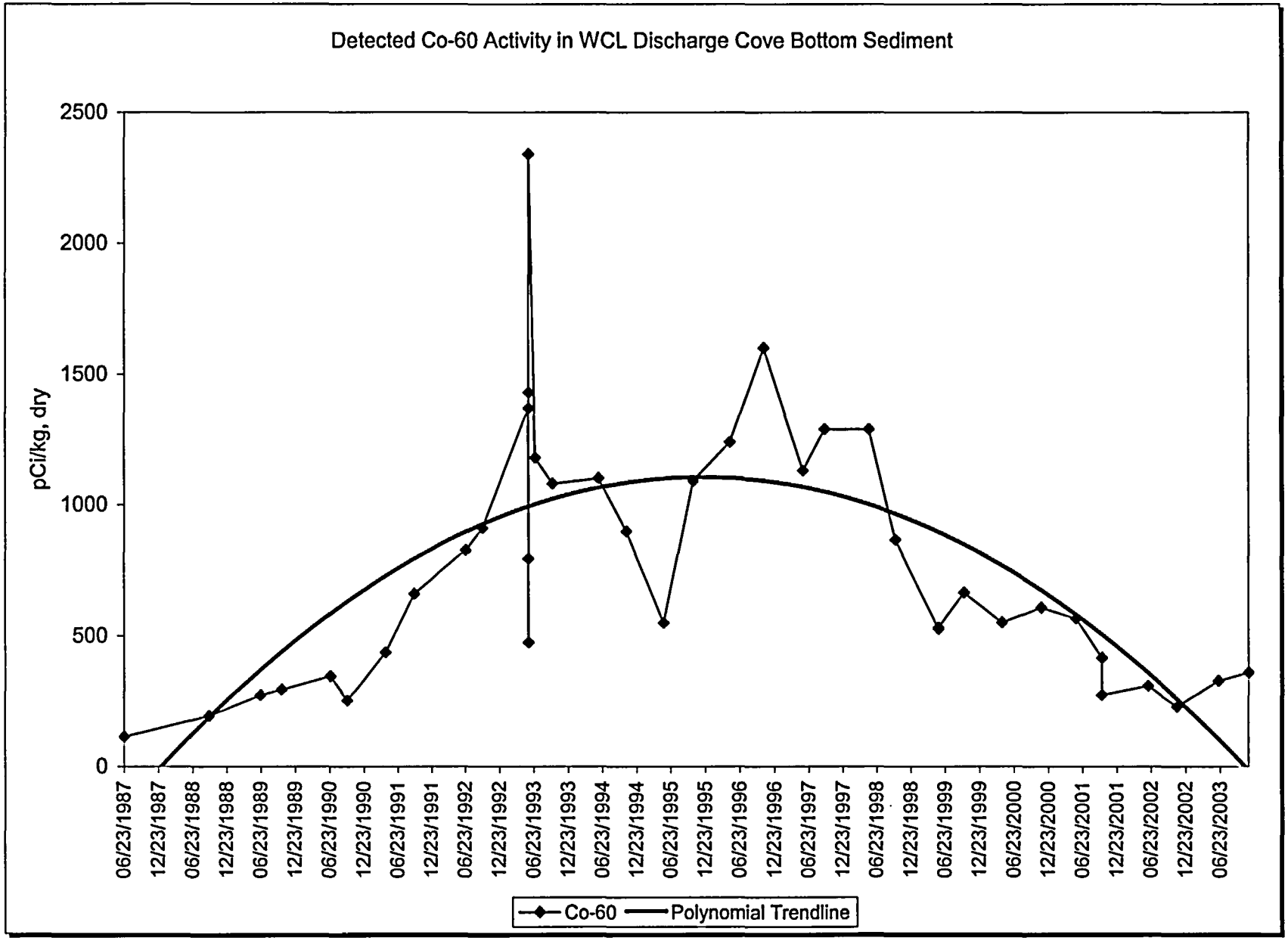

Detected Co-60 Activity in WCL Discharge Cove Bottom Sediment
pCi/kg, dry
2500
2000
1500
1000
500
0
06/23/1987
12/23/1987
06/23/1988
12/23/1988
06/23/1989
12/23/1989
06/23/1990
12/23/1990
06/23/1991
12/23/1991
06/23/1992
12/23/1992
06/23/1993
12/23/1993
06/23/1994
12/23/1994
06/23/1995
12/23/1995
06/23/1996
12/23/1996
06/23/1997
12/23/1997
06/23/1998
12/23/1998
06/23/1999
12/23/1999
06/23/2000
12/23/2000
06/23/2001
12/23/2001
06/23/2002
12/23/2002
06/23/2003
Co-60
Polynomial Trendline

CHART 7

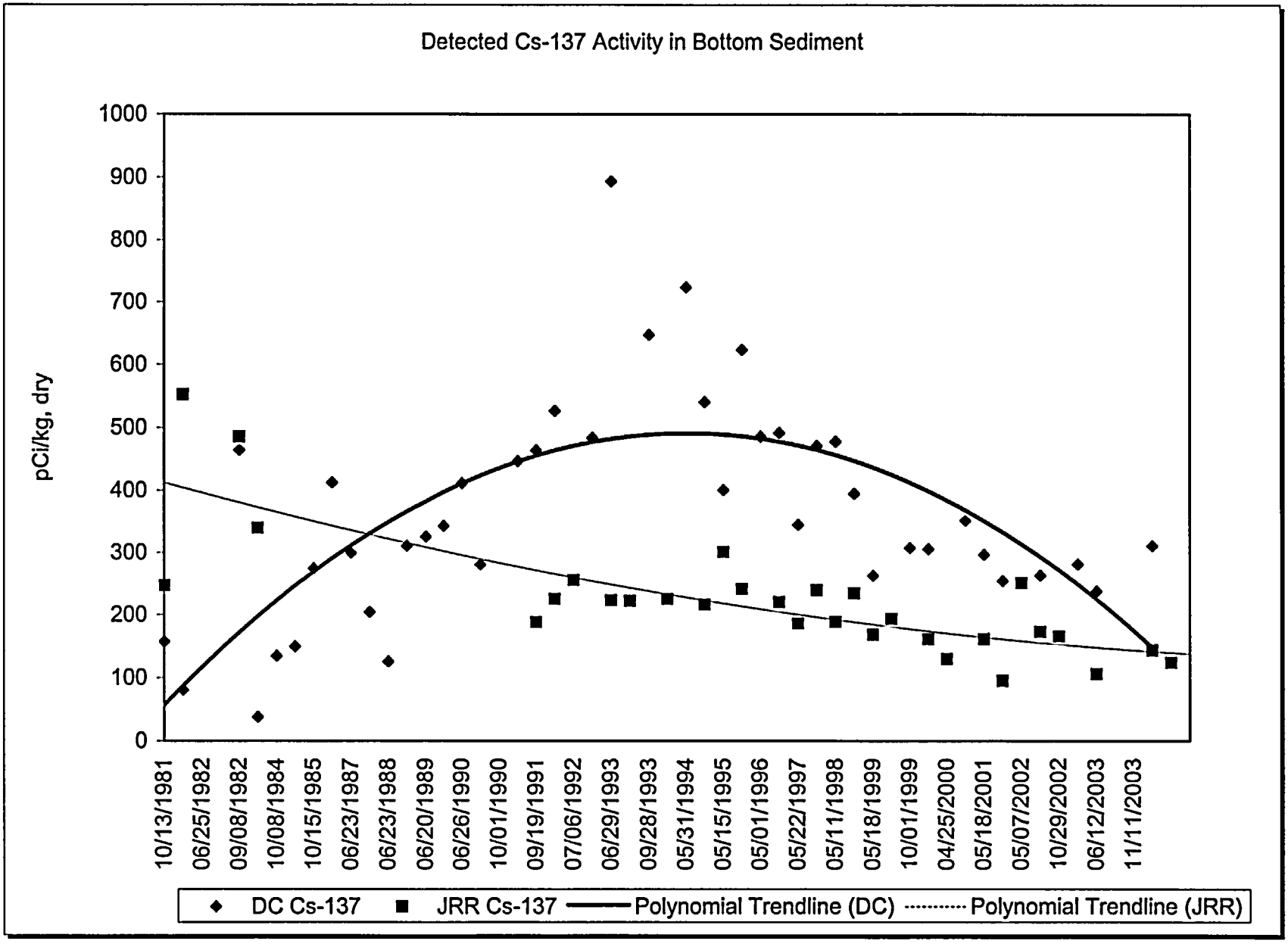

Detected Cs-137 Activity in Bottom Sediment
pCi/kg, dry
1000
900
800
700
600
500
400
300
200
100
0
10/13/1981
06/25/1982
09/08/1982
10/08/1984
10/15/1985
06/23/1987
06/23/1988
06/20/1989
06/26/1990
10/01/1990
09/19/1991
07/06/1992
06/29/1993
09/28/1993
05/31/1994
05/15/1995
05/01/1996
05/22/1997
05/11/1998
05/18/1999
10/01/1999
04/25/2000
05/18/2001
05/07/2002
10/29/2002
06/12/2003
11/11/2003
DC Cs-137
JRR Cs-137
Polynomial Trendline (DC)
Polynomial Trendline (JRR)

CHART 8

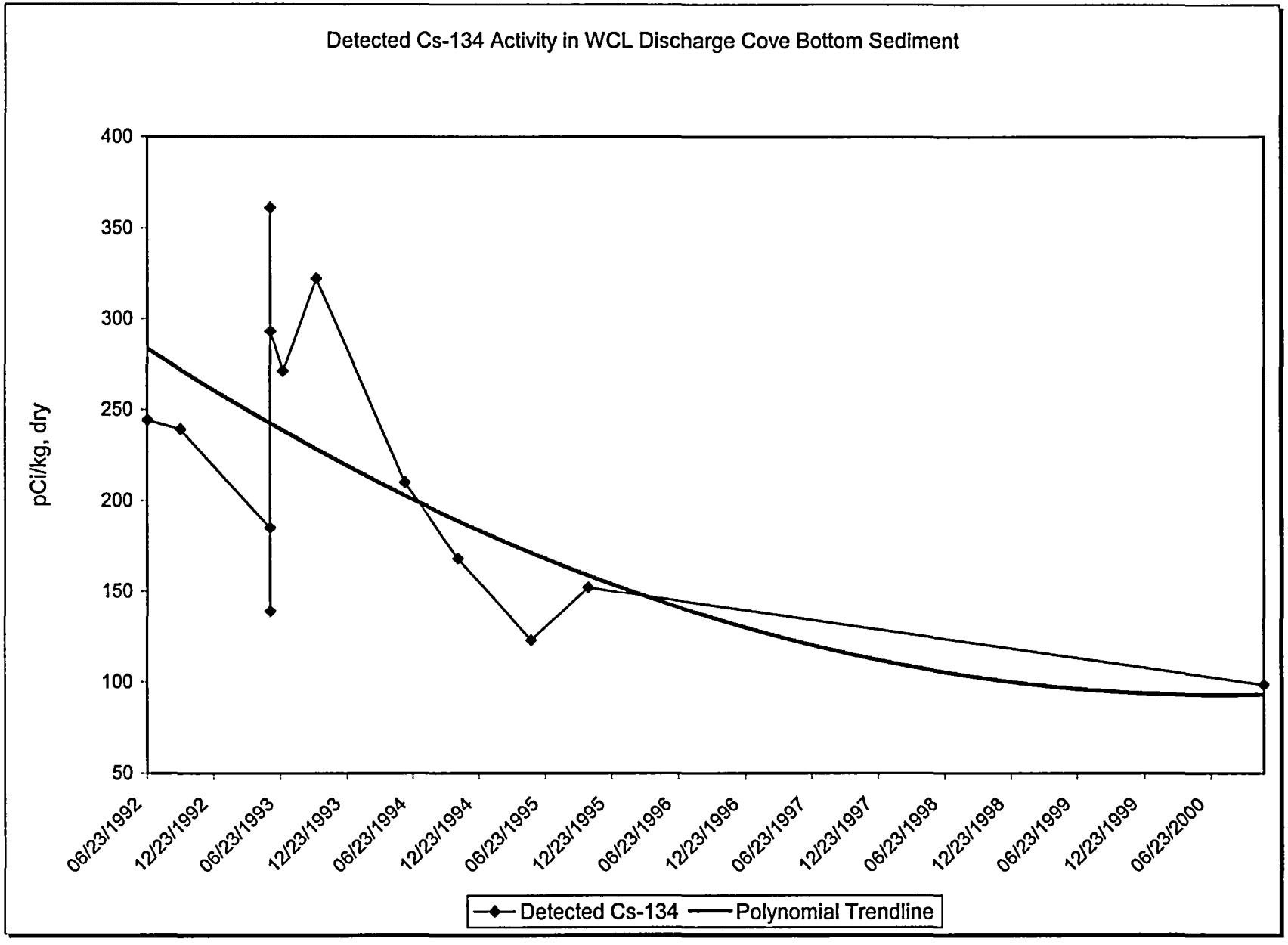
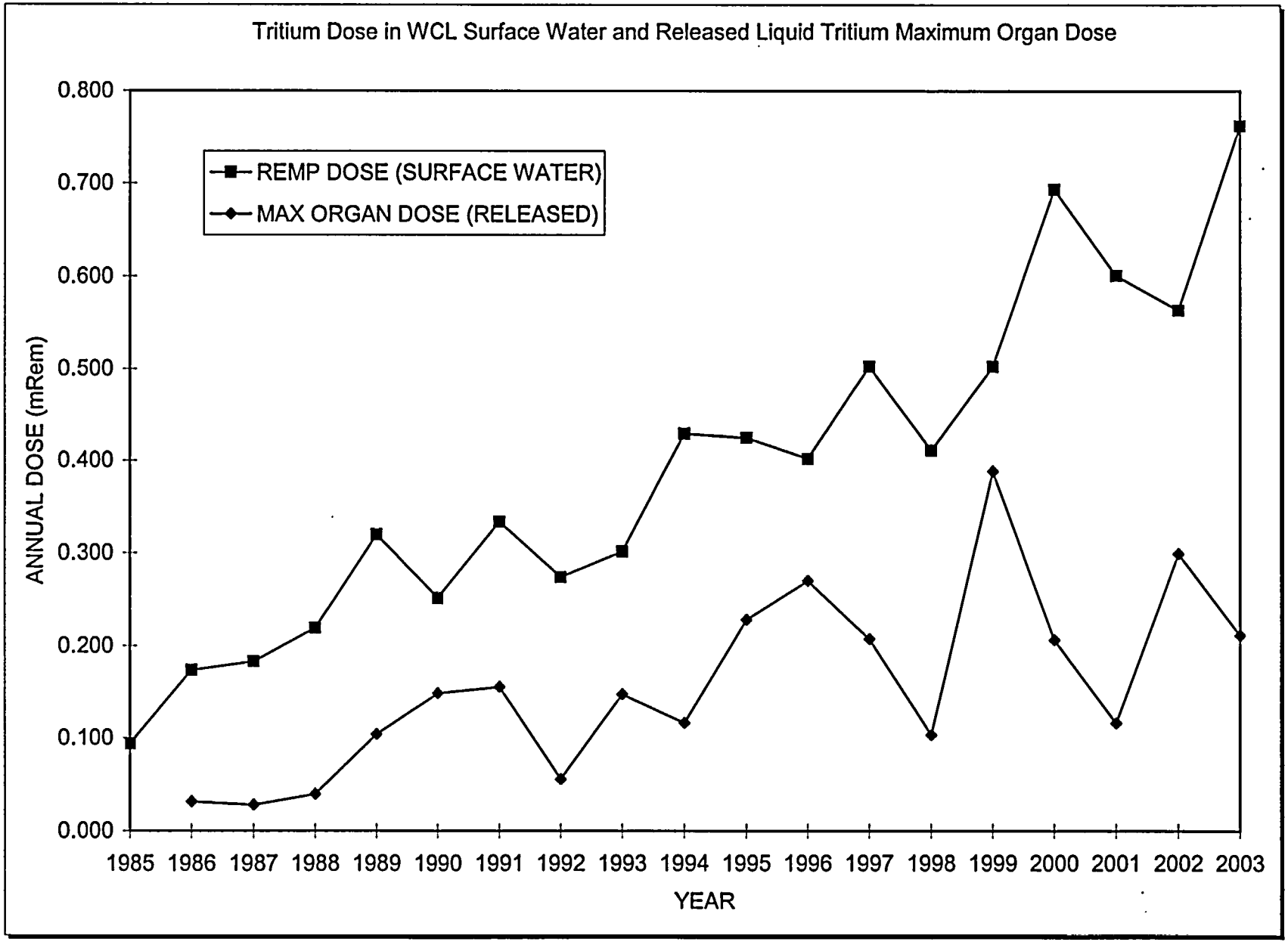

Detected Cs-134 Activity in WCL Discharge Cove Bottom Sediment
pCi/kg, dry
400
350
300
250
200
150
100
50
06/23/1992
12/23/1992
06/23/1993
12/23/1993
06/23/1994
12/23/1994
06/23/1995
12/23/1995
06/23/1996
12/23/1996
06/23/1997
12/23/1997
06/23/1998
12/23/1998
06/23/1999
12/23/1999
06/23/2000
Detected Cs-134
Polynomial Trendline

CHART 9


Tritium Dose in WCL Surface Water and Released Liquid Tritium Maximum Organ Dose
REMP DOSE (SURFACE WATER)
MAX ORGAN DOSE (RELEASED)
ANNUAL DOSE (mRem)
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003
YEAR

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APPENDIX A

INTERLABORATORY COMPARISON PROGRAM RESULTS

NOTE: Environmental Inc., Midwest Laboratory participates in intercomparison studies administered by Environmental Resources Associates, and serves as a replacement for studies conducted previously by the U.S. EPA Environmental Monitoring Systems Laboratory, Las Vegas, Nevada. Results are reported in Appendix A. TLD Intercomparison results, in-house spikes, blanks, duplicates and mixed analyte performance evaluation program results are also reported. Appendix A is updated four times a year; the complete Appendix is included in March, June, September and December monthly progress reports only.

January, 2003 through December, 2003

Appendix A

Interlaboratory Comparison Program Results

Environmental, Inc., Midwest Laboratory, formerly Teledyne Brown Engineering Environmental Services Midwest Laboratory has participated in interlaboratory comparison (crosscheck) programs since the formulation of it's quality control program in December 1971. These programs are operated by agencies which supply environmental type samples containing concentrations of radionuclides known to the issuing agency but not to participant laboratories. The purpose of such a program is to provide an independent check on a laboratory's analytical procedures and to alert it of any possible problems.

Participant laboratories measure the concentration of specified radionuclides and report them to the issuing agency. Several months later, the agency reports the known values to the participant laboratories and specifies control limits. Results consistently higher or lower than the known values or outside the control limits indicate a need to check the instruments or procedures used.

Results in Table A-1 were obtained through participation in the environmental sample crosscheck program administered by Environmental Resources Associates, serving as a replacement for studies conducted previously by the U.S. EPA Environmental Monitoring Systems Laboratory, Las Vegas, Nevada.

The results in Table A-2 were obtained for Thermoluminescent Dosimeters (TLDs), via International Intercomparison of Environmental Dosimeters under the sponsorships listed in Table A-2. Results of internal laboratory testing is also listed.

Table A-3 lists results of the analyses on in-house "spiked" samples for the past twelve months. All samples are prepared using NIST traceable sources. Data for previous years available upon request.

Table A-4 lists results of the analyses on in-house "blank" samples for the past twelve months. Data for previous years available upon request. request.

Table A-5 list results of the in-house "duplicate" program for the past twelve months. Acceptance is based on the difference of the results being less than the sum of the errors. Data for previous years available upon request.

The results in Table A-6 were obtained through participation in the Mixed Analyte Performance Evaluation Program.

The results in Table A-7 were obtained through participation in the Environmental Measurement Laboratory Quality Assessment Program.

Attachment A lists acceptance criteria for "spiked" samples.

Out-of-limit results are explained directly below the result.

Attachment A

ACCEPTANCE CRITERIA FOR "SPIKED" SAMPLES

LABORATORY PRECISION: ONE STANDARD DEVIATION VALUES FOR VARIOUS ANALYSES[a]

Analysis	Level	One standard deviation for single determination
Gamma Emitters	5 to 100 pCi/liter or kg > 100 pCi/liter or kg	5.0 pCi/liter 5% of known value
Strontium-89[b]	5 to 50 pCi/liter or kg > 50 pCi/liter or kg	5.0 pCi/liter 10% of known value
Strontium-90[b]	2 to 30 pCi/liter or kg > 30 pCi/liter or kg	5.0 pCi/liter 10% of known value
Potassium-40	> 0.1 g/liter or kg	5% of known value
Gross alpha	20 pCi/liter > 20 pCi/liter	5.0 pCi/liter 25% of known value
Gross beta	100 pCi/liter > 100 pCi/liter	5.0 pCi/liter 5% of known value
Tritium	4,000 pCi/liter > 4,000 pCi/liter	1s = (pCi/liter) = $169.85 \times (\text{known})^{0.0933}$ 10% of known value
Radium-226,-228	0.1 pCi/liter	15% of known value
Plutonium	0.1 pCi/liter, gram, or sample	10% of known value
Iodine-131, Iodine-129[b]	55 pCi/liter > 55 pCi/liter	6.0 pCi/liter 10% of known value
Uranium-238, Nickel-63[b] Technetium-99[b]	35 pCi/liter > 35 pCi/liter.	6.0 pCi/liter 15% of known value
Iron-55[b]	50 to 100 pCi/liter > 100 pCi/liter	10 pCi/liter 10% of known value
Others[b]	---	20% of known value

[a] From EPA publication, "Environmental Radioactivity Laboratory Intercomparison Studies Program, Fiscal Year, 1981-1982, EPA-600/4-81-004.

[b] Laboratory limit.

TABLE A-1. Interlaboratory Comparison Crosscheck program, Environmental Resource Associates (ERA)[a].

Lab Code	Date	Analysis	Concentration (pCi/L) Laboratory Result[b]	ERA Result[c]	Control Limits
STW-973	02/17/03	Sr-89	17.0 ± 0.5	15.9 ± 5.0	7.2 - 24.6
STW-973	02/17/03	Sr-90	8.9 ± 0.3	9.0 ± 5.0	0.4 - 17.7
STW-974	02/17/03	Ba-133	14.5 ± 0.9	19.5 ± 5.0	10.8 - 28.2
STW-974	02/17/03	Co-60	37.5 ± 0.9	37.4 ± 5.0	28.7 - 46.1
STW-974	02/17/03	Cs-134	18.2 ± 0.6	17.8 ± 5.0	9.1 - 26.5
STW-974	02/17/03	Cs-137	42.7 ± 1.0	44.2 ± 5.0	35.5 - 52.9
STW-974	02/17/03	Zn-65	56.8 ± 2.2	60.3 ± 6.0	49.9 - 70.7
STW-975[d]	02/17/03	Gr. Alpha	18.4 ± 0.3	37.6 ± 9.4	21.3 - 53.9
STW-975	02/17/03	Gr. Beta	11.7 ± 0.5	8.6 ± 5.0	0.0 - 17.2
STW-976	02/17/03	Ra-226	4.1 ± 0.1	4.7 ± 0.7	3.5 - 6.0
STW-976	02/17/03	Ra-228	7.6 ± 0.5	6.5 ± 1.6	3.7 - 9.3
STW-976	02/17/03	Uranium	52.9 ± 1.9	53.7 ± 5.4	44.4 - 63.0
STW-983	05/19/03	H-3	1290.0 ± 25.0	1250.0 ± 331.0	678.0 - 1820.0
STW-984	05/19/03	I-131	19.7 ± 1.3	20.8 ± 3.0	15.6 - 26.0
STW-985	05/19/03	Gr. Alpha	54.4 ± 3.0	70.3 ± 17.6	39.9 - 101.0
STW-985	05/19/03	Ra-226	14.9 ± 0.2	16.5 ± 2.5	12.2 - 20.8
STW-985	05/19/03	Ra-228	13.1 ± 0.6	10.3 ± 2.6	5.8 - 14.8
STW-985	05/19/03	Uranium	14.5 ± 0.4	15.1 ± 3.0	9.9 - 20.3
STW-986	05/19/03	Co-60	56.9 ± 8.6	63.8 ± 5.0	55.1 - 72.5
STW-986[e]	05/19/03	Cs-134	61.6 ± 6.6	75.7 ± 5.0	67.0 - 84.4
STW-986	05/19/03	Cs-137	143.0 ± 1.2	150.0 ± 7.5	137.0 - 163.0
STW-986	05/19/03	Gr. Beta	309.0 ± 2.7	363.0 ± 54.5	269.0 - 457.0
STW-986	05/19/03	Sr-89	33.1 ± 0.2	31.3 ± 5.0	22.6 - 40.0
STW-986	05/19/03	Sr-90	28.8 ± 1.3	27.4 ± 5.0	18.7 - 36.1
STW-988	08/18/03	Ra-226	13.3 ± 1.1	13.4 ± 2.0	9.9 - 16.9
STW-988	08/18/03	Ra-228	11.5 ± 1.0	12.5 ± 3.1	7.1 - 17.9
STW-988	08/18/03	Uranium	12.3 ± 0.4	11.4 ± 3.0	6.2 - 16.6
STW-989	08/18/03	Ba-133	18.1 ± 1.9	20.7 ± 5.0	12.0 - 29.4
STW-989	08/18/03	Co-60	35.9 ± 1.3	37.4 ± 5.0	28.7 - 46.1
STW-989	08/18/03	Cs-134	32.6 ± 1.8	32.6 ± 5.0	23.9 - 41.3
STW-989	08/18/03	Cs-137	48.3 ± 0.6	44.3 ± 5.0	35.6 - 53.0
STW-989	08/18/03	Zn-65	58.9 ± 2.1	60.2 ± 6.0	49.8 - 70.6
STW-990	08/18/03	Gr. Alpha	41.8 ± 3.4	56.2 ± 16.3	36.9 - 93.3
STW-990[f]	08/18/03	Gr. Beta	51.3 ± 3.0	31.6 ± 5.0	22.9 - 40.3
STW-991	08/18/03	Sr-89	57.2 ± 4.3	58.8 ± 5.0	50.1 - 67.5
STW-991	08/18/03	Sr-90	21.2 ± 0.9	20.6 ± 5.0	11.9 - 29.3

TABLE A-1. Interlaboratory Comparison Crosscheck program, Environmental Resource Associates (ERA)[a].

Lab Code	Date	Analysis	Concentration (pCi/L) Laboratory Result[b]	ERA Result[c]	Control Limits
STW-997	11/18/03	Gr. Alpha	37.0 ± 2.0	29.5 ± 7.4	16.7 - 42.3
STW-997	11/18/03	Gr. Beta	26.5 ± 0.8	26.3 ± 5.0	17.6 - 35.0
STW-998	11/18/03	I-131	14.8 ± 0.3	16.5 ± 3.0	11.3 - 21.7
STW-999	11/18/03	Ra-226	17.2 ± 1.1	17.8 ± 2.7	13.2 - 22.4
STW-999	11/18/03	Ra-228	6.6 ± 0.3	6.8 ± 1.7	3.8 - 9.7
STW-999	11/18/03	Uranium	11.7 ± 0.3	11.7 ± 3.0	6.5 - 16.9
STW-1000	11/18/03	H-3	15900.0 ± 174.0	14300.0 ± 1430.0	11800.0 - 16800.0
STW-1001	11/18/03	Gr. Alpha	32.9 ± 0.3	54.2 ± 3.0	30.7 - 77.7
STW-1001	11/18/03	Ra-226	16.5 ± 0.9	16.1 ± 2.4	11.9 - 20.3
STW-1001	11/18/03	Ra-228	6.2 ± 0.5	5.5 ± 1.4	3.1 - 7.9
STW-1001	11/18/03	Uranium	9.7 ± 1.5	9.3 ± 13.6	4.1 - 14.5
STW-1002	11/18/03	Co-60	27.7 ± 1.9	27.7 ± 5.0	19.0 - 36.4
STW-1002	11/18/03	Cs-134	21.5 ± 1.1	23.4 ± 5.0	17.6 - 29.2
STW-1002	11/18/03	Cs-137	66.3 ± 2.8	64.2 ± 5.0	55.5 - 72.9
STW-1002	11/18/03	Gr. Beta	159.0 ± 2.5	168.0 ± 5.0	124.0 - 212.0
STW-1002	11/18/03	Sr-89	48.5 ± 0.4	50.4 ± 5.0	41.7 - 59.1
STW-1002	11/18/03	Sr-90	10.1 ± 3.0	10.2 ± 25.2	1.5 - 18.9

[a] Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the environmental samples crosscheck program operated by Environmental Resources Associates (ERA).

[b] Unless otherwise Indicated, the laboratory result is given as the mean ± standard deviation for three determinations.

[c] Results are presented as the known values, expected laboratory precision (1 sigma, 1 determination) and control limits as provided by ERA.

[d] Recount of the original sample still low. The ERA blank was spiked in the lab; known value of 20.1 pCi/L, measured 21.5 ± 1.1 pCi/L. No explanation for ERA test failure.

[e] Lower bias observed for gamma spectroscopic analysis. The undiluted sample was reanalyzed; Results of reanalysis, Co-60: 62.3 pCi/L., Cs-134: 69.2 pCi/L., Cs-137: 152.3 pCi/L.

[f] Reason for deviation unknown. A recount of the original planchets averaged 43.4 pCi/L. Cs-137activity by gamma spectroscopy; 28.3 pCi/L. Result of reanalysis; 29.3 pCi/L.

TABLE A-2. Crosscheck program results; Thermoluminescent Dosimetry, (TLDs).

Lab Code	TLD Type	Date	Description	mR Known Value	mR Lab Result ± 2 sigma	mR Control Limits
Environmental, Inc.						
2003-1	CaSO4: Dy Cards	8/8/2003	Reader 1, 120	4.69	4.74 ± 0.54	3.28 - 6.10
2003-1	CaSO4: Dy Cards	8/8/2003	Reader 1, 150	3.00	3.02 ± 0.20	2.10 - 3.90
2003-1	CaSO4: Dy Cards	8/8/2003	Reader 1, 180	2.08	1.89 ± 0.45	1.46 - 2.70
2003-1	CaSO4: Dy Cards	8/8/2003	Reader 1, 180	2.08	2.11 ± 0.22	1.46 - 2.70
2003-1	CaSO4: Dy Cards	8/8/2003	Reader 1, 30	75.00	84.40 ± 4.87	52.50 - 97.50
2003-1	CaSO4: Dy Cards	8/8/2003	Reader 1, 60	18.75	19.11 ± 1.86	13.13 - 24.38
2003-1	CaSO4: Dy Cards	8/8/2003	Reader 1, 60	18.75	22.82 ± 5.41	13.13 - 24.38
2003-1	CaSO4: Dy Cards	8/8/2003	Reader 1, 90	8.33	9.05 ± 1.17	5.83 - 10.83
2003-1	CaSO4: Dy Cards	8/8/2003	Reader 1, 90	8.33	7.60 ± 1.08	5.83 - 10.83
Environmental, Inc.						
2003-2	CaSO4: Dy Cards	1/12/2004	Reader 1, 30	61.96	73.50 ± 2.58	43.37 - 80.55
2003-2	CaSO4: Dy Cards	1/12/2004	Reader 1, 60	15.49	19.70 ± 0.51	10.84 - 20.14
2003-2	CaSO4: Dy Cards	1/12/2004	Reader 1, 60	15.49	16.93 ± 1.37	10.84 - 20.14
2003-2	CaSO4: Dy Cards	1/12/2004	Reader 1, 90	6.88	8.06 ± 0.60	4.82 - 8.94
2003-2	CaSO4: Dy Cards	1/12/2004	Reader 1, 90	6.88	6.64 ± 0.58	4.82 - 8.94
2003-2	CaSO4: Dy Cards	1/12/2004	Reader 1, 120	3.87	4.39 ± 0.17	2.71 - 5.03
2003-2	CaSO4: Dy Cards	1/12/2004	Reader 1, 150	2.48	2.34 ± 0.18	1.74 - 3.22
2003-2	CaSO4: Dy Cards	1/12/2004	Reader 1, 150	2.48	2.51 ± 0.16	1.74 - 3.22
2003-2	CaSO4: Dy Cards	1/12/2004	Reader 1, 180	1.72	2.01 ± 0.13	1.20 - 2.24

TABLE A-3. In-House "Spike" Samples

Lab Code	Sample Type	Date	Concentration (pCi/L)[a] Analysis	Laboratory results 2s, n=1[b]	Known Activity	Control Limits[c]
SPW-356	water	1/2/2003	Sr-90	34.04 ± 1.57	30.93	24.74 - 37.12
W-10303	water	1/3/2003	Gr. Beta	63.24 ± 1.20	63.90	53.90 - 73.90
W-11303	water	1/13/2003	Gr. Beta	59.75 ± 1.10	63.90	53.90 - 73.90
W-12103	water	1/21/2003	Gr. Beta	61.56 ± 1.59	63.99	53.99 - 73.99
SPAP-446	Air Filter	1/31/2003	Gr. Beta	1.49 ± 0.02	1.52	-8.48 - 11.52
SPW-468	water	1/31/2003	H-3	95982.00 ± 865.00	89607.00	71685.60 - 107528.40
W-20703	water	2/7/2003	Fe-55	9095.00 ± 114.00	10587.00	8469.60 - 12704.40
SPU-1347	Urine	3/1/2003	H-3	1724.00 ± 412.00	1784.33	1101.27 - 2467.39
DW-30303	water	3/3/2003	Gr. Beta	65.44 ± 0.59	63.90	53.90 - 73.90
SPCH-964	Charcoal	3/8/2003	I-131(G)	73.37 ± 0.28	69.45	59.45 - 79.45
SPMI-1086	Milk	3/13/2003	Cs-137	57.18 ± 8.03	49.50	39.50 - 59.50
SPMI-1086	Milk	3/13/2003	I-131	75.13 ± 12.01	67.60	54.08 - 81.12
SPMI-1086	Milk	3/13/2003	I-131(G)	65.81 ± 1.06	67.56	57.56 - 77.56
SPW-1088	water	3/13/2003	Co-60	27.16 ± 4.79	28.20	18.20 - 38.20
SPW-1088	water	3/13/2003	Cs-137	51.74 ± 9.15	49.50	39.50 - 59.50
SPW-1088	water	3/13/2003	I-131(G)	68.14 ± 12.92	67.60	57.60 - 77.60
SPW-1088	water	3/13/2003	I-131	76.94 ± 1.13	67.56	54.05 - 81.07
SPVE-1110	Vegetation	3/14/2003	I-131(G)	122.80 ± 16.80	124.00	111.60 - 136.40
SPW-1194	water	3/21/2003	Co-60	31.09 ± 6.28	28.15	18.15 - 38.15
SPW-1194	water	3/21/2003	Cs-137	55.11 ± 0.13	49.50	39.50 - 59.50
SPW-1194	water	3/21/2003	I-131(G)	66.17 ± 9.15	67.60	57.60 - 77.60
W-32103	water	3/21/2003	C-14	5201.00 ± 16.60	4966.00	2979.60 - 6952.40
SPCH-1429	Charcoal	4/1/2003	I-131(G)	8.83 ± 0.11	9.18	-0.82 - 19.18
W-40103	water	4/1/2003	Gr. Beta	67.74 ± 0.52	63.39	53.39 - 73.39
SPF-1407	Fish	4/2/2003	Cs-134	0.58 ± 0.03	0.59	0.35 - 0.83
SPF-1407	Fish	4/2/2003	Cs-137	1.29 ± 0.06	1.32	0.79 - 1.85
SPAP-1409	Air Filter	4/2/2003	Gr. Beta	1.44 ± 0.02	1.51	-8.49 - 11.51
SPU-41203	Urine	4/12/2003	H-3	1798.50 ± 409.30	1784.33	1101.27 - 2467.39
SPU-41703	Urine	4/17/2003	H-3	1625.10 ± 401.30	1784.33	1101.27 - 2467.39
SPW-2022	water	4/25/2003	H-3	89007.00 ± 798.00	88463.00	70770.40 - 106155.60
SPW-2053	water	4/28/2003	Cs-137	45.70 ± 9.44	49.35	39.35 - 59.35
SPW-2053	water	4/28/2003	Sr-90	47.51 ± 1.87	44.47	35.58 - 53.36
SPMI-2055	Milk	4/28/2003	Cs-137	61.65 ± 7.17	65.80	55.80 - 75.80
SPMI-2055	Milk	4/28/2003	Sr-90	38.45 ± 1.59	44.74	35.79 - 53.69
W-50603	water	5/6/2003	Gr. Beta	70.95 ± 0.53	63.39	53.39 - 73.39
W-60303	water	6/3/2003	Gr. Beta	63.00 ± 0.51	65.73	55.73 - 75.73
SPW-3960	water	7/15/2003	H-3	88700.00 ± 822.00	87369.00	69895.20 - 104842.80
SPMI-4019	Milk	7/18/2003	Cs-137	47.17 ± 7.22	49.11	39.11 - 59.11
SPMI-4019	Milk	7/18/2003	Sr-89	40.95 ± 4.88	49.49	39.49 - 59.49
SPMI-4019	Milk	7/18/2003	Sr-90	45.30 ± 1.73	44.24	35.39 - 53.09
SPW-4023	water	7/18/2003	Cs-137	51.92 ± 6.24	49.11	39.11 - 59.11
SPW-4023	water	7/18/2003	Sr-89	42.49 ± 10.23	49.49	39.49 - 59.49
SPW-4023	water	7/18/2003	Sr-90	49.69 ± 3.04	44.24	35.39 - 53.09
SPW-4518	water	8/8/2003	Fe-55	8176.00 ± 107.00	9330.00	7464.00 - 11196.00

TABLE A-3. In-House "Spike" Samples

Lab Code	Sample Type	Date	Analysis	Concentration (pCi/L) Laboratory results 2s, n=1[b]	Known Activity	Control Limits[c]
SPW-6197	water	10/16/2003	Tc-99	540.14 ± 54.00	539.73	377.81 - 701.65
SPAP-3958	Air Filter	10/28/2003	Gr. Beta	1.45 ± 0.02	1.50	-8.50 - 11.50
SPW-6401	water	10/28/2003	H-3	84867.00 ± 826.00	85984.00	68787.20 - 103180.80
SPAP-6403	Air Filter	10/28/2003	Gr. Beta	1.71 ± 0.02	1.49	-8.51 - 11.49
SPF-6418	Fish	10/28/2003	Cs-134	0.50 ± 0.02	0.49	0.29 - 0.69
SPF-6418	Fish	10/28/2003	Cs-137	1.37 ± 0.05	1.30	0.78 - 1.82
SPW-6421	water	10/28/2003	Fe-55	104.18 ± 1.26	88.18	68.18 - 108.18
SPMI-7459	Milk	12/12/2003	Cs-134	41.06 ± 2.45	41.88	31.88 - 51.88
SPMI-7459	Milk	12/12/2003	Cs-137	48.48 ± 4.99	48.64	38.64 - 58.64
SPMI-7459	Milk	12/12/2003	Sr-89	55.94 ± 4.12	65.80	52.64 - 78.96
SPMI-7459	Milk	12/12/2003	Sr-90	41.86 ± 1.57	43.80	35.04 - 52.56
SPW-7461	water	12/12/2003	Cs-134	44.07 ± 1.49	41.88	31.88 - 51.88
SPW-7461	water	12/12/2003	Cs-137	50.26 ± 2.67	48.64	38.64 - 58.64
SPW-7461	water	12/12/2003	Sr-89	56.41 ± 4.87	65.80	52.64 - 78.96
SPW-7461	water	12/12/2003	Sr-90	48.44 ± 1.84	43.80	35.04 - 52.56

[c] Control limits are based on Attachment A, Page A2 of this report.

NOTE: For fish, Jello is used for the Spike matrix. For Vegetation, cabbage is used for the Spike matrix.

TABLE A-4. In-House "Blank" Samples[1]

Lab Code	Sample Type	Date	Analysis	Concentration (pCi/L)[a]		
				Laboratory results (4.66σ)		Acceptance
				LLD	Activity[b]	Criteria (4.66 σ)
SPW-357	water	1/2/2003	Sr-90	0.50	0.12 ± 0.25	1
W-10303	water	1/3/2003	Gr. Beta	0.12	0.022 ± 0.10	3.2
W-11303	water	1/13/2003	Gr. Beta	0.14	0.035 ± 0.10	3.2
W-12103	water	1/21/2003	Gr. Beta	0.12	0.029 ± 0.09	3.2
SPAP-447	Air Filter	1/31/2003	Gr. Beta	0.00	-0.0034 ± 0.00	3.2
SPW-469	water	1/31/2003	H-3	160.20	19.3 ± 80.30	200
W-20103	water	2/1/2003	Gr. Beta	0.17	0.0 ± 0.12	3.2
W-20703	water	2/7/2003	Fe-55	802.00	149 ± 498.00	1000
DW-30303		3/3/2003	Gr. Beta	0.15	0.007 ± 0.11	3.2
SPCH-965	Charcoal Cani	3/8/2003	I-131(G)	0.01		9.6
SPMI-1087	Milk	3/13/2003	Cs-134	7.49		10
SPMI-1087	Milk	3/13/2003	Cs-137	7.90		10
SPMI-1087	Milk	3/13/2003	I-131	0.33	-0.013 ± 0.18	0.5
SPMI-1087	Milk	3/13/2003	I-131(G)	7.76		20
SPW-1089	water	3/13/2003	Co-60	4.48		10
SPW-1089	water	3/13/2003	Cs-134	5.60		10
SPW-1089	water	3/13/2003	Cs-137	4.32		10
SPW-1089	water	3/13/2003	I-131	0.29	-0.050 ± 0.16	0.5
SPVE-1111	Vegetation	3/14/2003	I-131(G)	7.53		20
W-32103	water	3/21/2003	C-14	17.50	-0.4 ± 9.200	200
SPCH-1430	Charcoal Cani	4/1/2003	I-131(G)	0.01		9.6
W-40103	water	4/1/2003	Gr. Beta	0.14	-0.11 ± 0.100	3.2
SPF-1408	Fish	4/2/2003	Cs-134	0.01		100
SPF-1408	Fish	4/2/2003	Cs-137	0.01		100
SPAP-1410	Air Filter	4/2/2003	Gr. Beta	0.00	-0.0029 ± 0.002	3.2
SPU-41203	Urine	4/12/2003	H-3	653.99	542.28 ± 364.780	200
SPU-41703	Urine	4/17/2003	H-3	648.35	100.1 ± 344.800	200
SPW-2054	water	4/28/2003	Cs-137	3.16		10
SPW-2054	water	4/28/2003	Sr-89	0.55	0.45 ± 0.50	5
SPW-2054	water	4/28/2003	Sr-90	0.55	0.072 ± 0.260	1
SPMI-2056[c]	Milk	4/28/2003	Sr-90	0.77	0.66 ± 0.430	1
SPMI-2056	Milk	4/28/2003	Cs-137	2.74		10
SPMI-2056	Milk	4/28/2003	I-131(G)	3.54		20
W-50603	water	5/6/2003	Gr. Beta	0.12	0 ± 0.090	3.2
W-60303	water	6/3/2003	Gr. Beta	0.14	-0.035 ± 0.095	3.2
SPW-3960	water	7/15/2003	H-3	156.60	53.4 ± 80.200	200
SPMI-4018	Milk	7/18/2003	Cs-137	4.10		10
SPMI-4018	Milk	7/18/2003	Sr-89	0.73	0.39 ± 0.880	5
SPMI-4018[c]	Milk	7/18/2003	Sr-90	0.51	0.93 ± 0.340	1
SPW-4024	water	7/18/2003	Sr-89	0.83	0.21 ± 0.730	5
SPW-4024	water	7/18/2003	Sr-90	0.62	0.09 ± 0.300	1
SPW-4519	water	8/8/2003	Fe-55	527.00	87 ± 369.000	1000
SPW-6401	water	10/28/2003	H-3	163.80	-23.8 ± 85.000	200

TABLE A-4. In-House "Blank" Samples

Lab Code	Sample Type	Date	Analysis	Concentration (pCi/L)[a]		
				Laboratory results (4.66σ)		Acceptance
				LLD	Activity[b]	Criteria (4.66 σ)
SPAP-6404	Air Filter	10/28/2003	Gr. Beta	0.87	-0.99 ± 0.440	3.2
SPF-6419	Fish	10/28/2003	Cs-134	0.01		100
SPF-6419	Fish	10/28/2003	Cs-137	0.01		100
SPMI-7460	Milk	12/12/2003	Cs-134	4.52		10
SPMI-7460	Milk	12/12/2003	Cs-137	5.77		10
SPMI-7460[c]	Milk	12/12/2003	Sr-90	0.50	1.26 ± 0.370	1

[a] Liquid sample results are reported in pCi/Liter, air filters(pCi/filter), charcoal (pCi/charcoal canister), and solid samples (pCi/kg).

[b] The activity reported is the net activity result.

[c] Low levels of Sr-90 are still detected in the environment. A concentration of (1-5 pCi/L) in milk is not unusual.

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration (pCi/L)[a] First Result	Second Result	Averaged Result
MI-24, 25	1/2/2003	K-40	1362.00 ± 117.00	1377.00 ± 188.00	1369.50 ± 110.72
MI-24, 25	1/2/2003	Sr-90	1.45 ± 0.40	2.21 ± 0.50	1.83 ± 0.32
CF-47, 48	1/2/2003	Gr. Beta	2.72 ± 0.10	2.84 ± 0.10	2.78 ± 0.07
CF-47, 48	1/2/2003	K-40	2.61 ± 0.31	2.32 ± 0.12	2.47 ± 0.17
AP-8827, 8828	1/2/2003	Be-7	0.06 ± 0.01	0.05 ± 0.02	0.05 ± 0.01
AP-8869, 8870	1/2/2003	Be-7	0.04 ± 0.02	0.05 ± 0.02	0.05 ± 0.01
MI-119, 120	1/8/2003	K-40	1351.90 ± 116.10	1234.70 ± 108.70	1293.30 ± 79.52
MI-119, 120	1/8/2003	Sr-90	2.22 ± 0.43	1.88 ± 0.40	2.05 ± 0.30
MI-213, 214	1/14/2003	K-40	1372.30 ± 104.80	1303.80 ± 109.10	1338.05 ± 75.64
MI-213, 214	1/14/2003	Sr-90	1.81 ± 0.41	2.29 ± 0.45	2.05 ± 0.31
MI-262, 263	1/15/2003	K-40	1399.20 ± 200.70	1347.70 ± 126.40	1373.45 ± 118.59
S-696, 697	1/29/2003	Gr. Alpha	24.70 ± 4.89	23.23 ± 4.64	23.97 ± 3.37
S-696, 697	1/29/2003	Gr. Beta	22.89 ± 2.67	22.71 ± 2.73	22.80 ± 1.91
MI-448, 449	2/3/2003	K-40	1159.70 ± 157.90	1396.40 ± 106.20	1278.05 ± 95.15
SW-470, 471	2/3/2003	Gr. Beta	13.62 ± 1.23	15.21 ± 1.21	14.42 ± 0.86
SW-470, 471	2/3/2003	K-40 (ICP)	5.10 ± 0.51	5.20 ± 0.52	5.15 ± 0.36
SW-470, 471	2/3/2003	K-40	5.80 ± 0.51	5.90 ± 0.52	5.85 ± 0.36
MI-517, 518	2/4/2003	K-40	1437.70 ± 125.50	1357.70 ± 188.00	1397.70 ± 113.02
MI-541, 542	2/5/2003	K-40	1443.00 ± 194.80	1385.20 ± 190.10	1414.10 ± 136.09
MI-620, 621	2/11/2003	K-40	1294.70 ± 115.10	1234.10 ± 165.10	1264.40 ± 100.63
DW-922, 923	3/4/2003	I-131	0.67 ± 0.16	0.79 ± 0.16	0.73 ± 0.11
CF-1048, 1049 b	3/10/2003	K-40	3.09 ± 0.12	2.67 ± 0.07	2.88 ± 0.07
LW-1152, 1153	3/13/2003	H-3	1147.26 ± 122.56	1094.42 ± 120.92	1120.84 ± 86.09
F-1120, 1121	3/14/2003	Cs-137	0.04 ± 0.02	0.05 ± 0.01	0.05 ± 0.01
F-1120, 1121	3/14/2003	Gr. Beta	2.04 ± 0.06	2.11 ± 0.06	2.08 ± 0.04
F-1120, 1121	3/14/2003	K-40	1.93 ± 0.38	1.89 ± 0.25	1.91 ± 0.23
DW-1278, 1279	3/25/2003	I-131	0.37 ± 0.22	0.34 ± 0.29	0.36 ± 0.18
SO-1380, 1381	3/25/2003	Gr. Beta	18.60 ± 2.68	20.53 ± 2.83	19.57 ± 1.95
LW-1299, 1300	3/27/2003	Gr. Beta	2.35 ± 0.55	2.48 ± 0.56	2.42 ± 0.39
LW-1320, 1321	3/27/2003	H-3	487.12 ± 104.43	422.00 ± 102.00	454.56 ± 72.99
W-1403, 1404	3/31/2003	Sr-90	0.96 ± 0.32	1.10 ± 0.42	1.03 ± 0.26
AP-2019, 2020	3/31/2003	Be-7	0.07 ± 0.01	0.08 ± 0.01	0.07 ± 0.01
MI-1422, 1423	4/1/2003	K-40	1410.00 ± 176.00	1340.00 ± 114.00	1375.00 ± 104.85
MI-2170, 2171	4/1/2003	K-40	1452.30 ± 129.10	1472.50 ± 191.00	1462.40 ± 115.27
MI-1422, 1423	4/2/2003	Sr-90	1.84 ± 0.42	1.15 ± 0.39	1.50 ± 0.29
AP-1633, 1634	4/2/2003	Be-7	0.05 ± 0.01	0.06 ± 0.01	0.06 ± 0.01
AP-1871, 1872	4/2/2003	Be-7	0.07 ± 0.01	0.07 ± 0.01	0.07 ± 0.01
AP-1974, 1975	4/2/2003	Be-7	0.08 ± 0.02	0.07 ± 0.02	0.08 ± 0.01
LW-1828, 1829	4/11/2003	Gr. Beta	2.49 ± 0.58	3.42 ± 0.63	2.96 ± 0.43
S-1544, 1545	4/15/2003	K-40	15.84 ± 2.36	15.41 ± 2.02	15.63 ± 1.55
DW-1913, 1914	4/15/2003	I-131	0.29 ± 0.21	0.42 ± 0.19	0.36 ± 0.14
MI-1996, 1997	4/21/2003	Sr-90	2.05 ± 0.74	3.25 ± 0.91	2.65 ± 0.58
MI-1996, 1997	4/22/2003	K-40	1580.20 ± 118.90	1602.10 ± 120.40	1591.15 ± 84.61

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration (pCi/L)[a] First Result	Second Result	Averaged Result
LW-2063, 2064	4/28/2003	Gr. Beta	2.33 ± 0.66	2.68 ± 0.60	2.51 ± 0.45
SWU-2275, 2276	4/28/2003	Gr. Beta	3.62 ± 0.67	4.60 ± 0.71	4.11 ± 0.49
G-2149, 2150	4/30/2003	Be-7	0.71 ± 0.19	0.69 ± 0.20	0.70 ± 0.14
TD-2339, 2340	5/1/2003	H-3	221.00 ± 91.00	161.00 ± 88.00	191.00 ± 63.29
SO-2381, 2382	5/1/2003	Cs-137	0.11 ± 0.03	0.10 ± 0.02	0.10 ± 0.02
SO-2381, 2382	5/1/2003	Gr. Alpha	11.14 ± 5.15	10.39 ± 5.60	10.77 ± 3.80
SO-2381, 2382	5/1/2003	Gr. Beta	35.18 ± 4.69	39.66 ± 5.24	37.42 ± 3.52
SO-2381, 2382	5/1/2003	K-40	18.29 ± 0.84	17.83 ± 0.84	18.06 ± 0.59
SO-2381, 2382	5/1/2003	Sr-90	0.06 ± 0.02	0.10 ± 0.02	0.08 ± 0.01
DW-2317, 2318	5/6/2003	I-131	1.77 ± 0.27	1.47 ± 0.26	1.62 ± 0.19
BS-2595, 2596	5/6/2003	Cs-137	0.06 ± 0.02	0.06 ± 0.02	0.06 ± 0.02
BS-2595, 2596	5/6/2003	K-40	13.74 ± 0.62	14.10 ± 0.73	13.92 ± 0.48
U-2484, 2485	5/9/2003	H-3	512.00 ± 100.00	370.00 ± 95.00	441.00 ± 68.97
SO-2645, 2646	5/14/2003	Be-7	1.18 ± 0.42	1.21 ± 0.35	1.19 ± 0.27
SO-2645, 2646	5/14/2003	Cs-137	0.11 ± 0.04	0.09 ± 0.05	0.10 ± 0.03
SO-2645, 2646	5/14/2003	K-40	16.50 ± 1.13	15.33 ± 1.09	15.91 ± 0.79
MI-2696, 2697	5/19/2003	K-40	1320.40 ± 124.50	1394.10 ± 113.00	1357.25 ± 84.07
MI-2696, 2697	5/19/2003	Sr-90	1.49 ± 0.47	2.01 ± 0.45	1.75 ± 0.32
SO-2787, 2788	5/28/2003	Cs-137	0.27 ± 0.04	0.23 ± 0.04	0.25 ± 0.03
SO-2787, 2788	5/28/2003	Gr. Beta	19.62 ± 1.73	20.81 ± 1.72	20.21 ± 1.22
SO-2787, 2788	5/28/2003	K-40	14.77 ± 1.02	14.41 ± 1.00	14.59 ± 0.71
MI-2840, 2841	5/28/2003	K-40	1179.50 ± 167.80	1401.70 ± 120.20	1290.60 ± 103.20
SWU-2864, 2865	5/28/2003	Gr. Beta	3.39 ± 0.59	3.41 ± 0.64	3.40 ± 0.43
BS-2888, 2889	5/29/2003	Cs-137	0.05 ± 0.02	0.07 ± 0.04	0.06 ± 0.02
BS-2888, 2889	5/29/2003	K-40	9.70 ± 0.83	10.17 ± 0.87	9.93 ± 0.60
W-3230, 3231	5/30/2003	Gr. Beta	4.33 ± 1.00	3.28 ± 1.22	3.81 ± 0.79
TD-3036, 3037	6/2/2003	H-3	529.50 ± 100.00	585.50 ± 102.00	557.50 ± 71.42
SL-2909, 2910 b	6/3/2003	Gr. Beta	7.10 ± 0.15	7.60 ± 0.16	7.35 ± 0.11
SL-2909, 2910	6/3/2003	K-40	3.90 ± 0.67	3.49 ± 0.52	3.70 ± 0.42
SW-3080, 3081	6/10/2003	Gr. Alpha	4.63 ± 1.90	4.47 ± 1.71	4.55 ± 1.28
SW-3080, 3081	6/10/2003	Gr. Beta	9.07 ± 1.29	8.98 ± 1.28	9.02 ± 0.91
VE-3172, 3173	6/11/2003	K-40	2.62 ± 0.35	3.17 ± 0.58	2.90 ± 0.34
F-3742, 3743	6/11/2003	Gr. Beta	3.47 ± 0.13	3.71 ± 0.14	3.59 ± 0.10
F-3742, 3743	6/11/2003	K-40	2.94 ± 0.39	2.70 ± 0.40	2.82 ± 0.28
SO-3325, 3326	6/13/2003	Gr. Beta	20.95 ± 1.88	19.97 ± 2.01	20.46 ± 1.38
MI-3253, 3254	6/17/2003	K-40	1329.40 ± 121.80	1417.60 ± 130.90	1373.50 ± 89.40
MI-3297, 3298	6/17/2003	Sr-90	2.14 ± 0.57	2.27 ± 0.50	2.21 ± 0.38
WW-3380, 3381	6/23/2003	Gr. Beta	5.58 ± 0.69	5.03 ± 0.69	5.31 ± 0.49
SWT-3403, 3404	6/24/2003	Gr. Beta	2.80 ± 0.56	2.63 ± 0.55	2.72 ± 0.39
MI-3424, 3425	6/24/2003	K-40	1422.80 ± 185.40	1216.20 ± 170.10	1319.50 ± 125.80
SW-3862, 3863	6/24/2003	Gr. Beta	3.66 ± 1.18	3.70 ± 1.22	3.68 ± 0.85
G-3479, 3480	6/25/2003	Be-7	1.52 ± 0.25	1.43 ± 0.28	1.47 ± 0.19
G-3479, 3480	6/25/2003	K-40	5.02 ± 0.45	5.10 ± 0.48	5.06 ± 0.33
LW-3809, 3810	6/30/2003	Gr. Beta	2.12 ± 0.76	2.39 ± 0.72	2.25 ± 0.52

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration (pCi/L)[a] First Result	Second Result	Averaged Result
LW-3809, 3810	6/30/2003	H-3	2814.09 ± 167.99	2812.17 ± 167.94	2813.13 ± 118.77
AP-4105, 4106	6/30/2003	Be-7	0.07 ± 0.01	0.07 ± 0.01	0.07 ± 0.01
G-3572, 3573	7/1/2003	Be-7	0.91 ± 0.24	0.81 ± 0.28	0.86 ± 0.18
G-3572, 3573	7/1/2003	Gr. Beta	6.35 ± 0.15	6.35 ± 0.15	6.35 ± 0.11
G-3572, 3573	7/1/2003	K-40	5.44 ± 0.55	5.68 ± 0.28	5.56 ± 0.31
G-3572, 3573	7/1/2003	Sr-90	0.01 ± 0.00	0.02 ± 0.00	0.01 ± 0.00
MI-3601, 3602	7/1/2003	K-40	1318.60 ± 117.40	1435.10 ± 117.80	1376.85 ± 83.16
MI-3601, 3602	7/1/2003	Sr-90	0.86 ± 0.51	1.74 ± 0.60	1.30 ± 0.39
AP-3933, 3934	7/1/2003	Be-7	0.07 ± 0.01	0.07 ± 0.01	0.07 ± 0.01
AP-4061, 4062	7/2/2003	Be-7	0.07 ± 0.01	0.08 ± 0.01	0.08 ± 0.01
AP-4147, 4148	7/2/2003	Be-7	0.08 ± 0.01	0.07 ± 0.01	0.07 ± 0.01
AP-4084, 4085	7/3/2003	Be-7	0.09 ± 0.02	0.08 ± 0.02	0.08 ± 0.01
LW-3786, 3787	7/9/2003	Gr. Beta	2.13 ± 0.56	2.93 ± 0.62	2.53 ± 0.42
WW-4168, 4169	7/11/2003	Gr. Beta	3.79 ± 1.87	4.48 ± 1.98	4.14 ± 1.36
CF-3975, 3976	7/14/2003	Be-7	1.64 ± 0.81	1.66 ± 0.57	1.65 ± 0.50
CF-3975, 3976	7/14/2003	K-40	6.54 ± 0.75	6.19 ± 0.50	6.36 ± 0.45
MI-4020, 4021	7/16/2003	K-40	1350.90 ± 174.90	1199.80 ± 153.20	1275.35 ± 116.25
DW-4272, 4273	7/29/2003	Gr. Beta	2.35 ± 0.92	2.29 ± 0.89	2.32 ± 0.64
SWU-4461, 4462	7/30/2003	Gr. Beta	2.28 ± 0.44	1.93 ± 0.43	2.10 ± 0.31
SL-4398, 4399	8/4/2003	Be-7	4.55 ± 1.05	4.50 ± 1.10	4.53 ± 0.76
SL-4398, 4399 b	8/4/2003	Gr. Beta	3.41 ± 0.12	3.12 ± 0.11	3.27 ± 0.08
SL-4398, 4399	8/4/2003	K-40	2.47 ± 0.67	2.44 ± 0.87	2.46 ± 0.55
G-4419, 4420	8/4/2003	Be-7	3.98 ± 0.63	3.93 ± 0.57	3.96 ± 0.42
G-4419, 4420	8/4/2003	Gr. Beta	5.38 ± 0.14	5.35 ± 0.16	5.37 ± 0.11
G-4419, 4420	8/4/2003	K-40	4.42 ± 0.66	4.32 ± 0.74	4.37 ± 0.50
TD-4550, 4551	8/4/2003	H-3	327.30 ± 95.10	390.20 ± 92.10	358.75 ± 66.19
MI-4482, 4483	8/6/2003	K-40	1301.40 ± 115.20	1370.30 ± 116.80	1335.85 ± 82.03
MI-4482, 4483	8/6/2003	Sr-90	0.81 ± 0.30	0.85 ± 0.31	0.83 ± 0.21
G-4526, 4527	8/6/2003	Be-7	1.47 ± 0.29	1.42 ± 0.28	1.45 ± 0.20
G-4526, 4527	8/6/2003	K-40	5.42 ± 0.56	5.21 ± 0.63	5.31 ± 0.42
SWU-4609, 4610	8/6/2003	Gr. Beta	3.22 ± 0.63	2.67 ± 0.64	2.95 ± 0.45
CW-4694, 4695	8/6/2003	Gr. Beta	1.48 ± 0.34	1.09 ± 0.34	1.29 ± 0.24
CW-4694, 4695	8/6/2003	H-3	22776.41 ± 428.73	21831.75 ± 420.10	22304.08 ± 300.12
LW-4673, 4674	8/13/2003	Gr. Beta	2.86 ± 0.65	3.75 ± 0.71	3.30 ± 0.48
MI-4735, 4736	8/19/2003	K-40	1396.30 ± 127.90	1410.10 ± 120.20	1403.20 ± 87.76
MI-4756, 4757	8/19/2003	Sr-90	1.66 ± 0.47	1.53 ± 0.44	1.60 ± 0.32
VE-4832, 4833	8/20/2003	K-40	1.96 ± 0.50	1.43 ± 0.47	1.70 ± 0.34
MI-4860, 4861	8/26/2003	K-40	1312.10 ± 191.80	1307.80 ± 109.30	1309.95 ± 110.38
SO-5082, 5083	8/28/2003	Cs-137	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00
SO-5082, 5083	8/28/2003	Gr. Beta	20.02 ± 1.84	20.92 ± 2.03	20.47 ± 1.37
CW-5349, 5350	8/31/2003	Gr. Beta	1.45 ± 0.39	1.55 ± 0.45	1.50 ± 0.30
CW-5349, 5350	8/31/2003	H-3	24429.50 ± 444.42	24744.25 ± 447.18	24586.88 ± 315.23
ME-4968, 4969	9/2/2003	Gr. Beta	4.90 ± 0.23	5.18 ± 0.24	5.04 ± 0.17
ME-4968, 4969	9/2/2003	K-40	2.46 ± 0.41	2.68 ± 0.37	2.57 ± 0.28

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration (pCi/L)[a] First Result	Second Result	Averaged Result
DW-4989, 4990	9/2/2003	Gr. Beta	2.20 ± 1.04	3.19 ± 1.14	2.70 ± 0.77
MI-5154, 5155	9/8/2003	K-40	1365.50 ± 116.70	1456.70 ± 119.10	1411.10 ± 83.37
MI-5154, 5155	9/8/2003	Sr-90	1.19 ± 0.39	1.39 ± 0.39	1.29 ± 0.28
AP-6177, 6178	9/29/2003	Be-7	0.07 ± 0.01	0.06 ± 0.01	0.06 ± 0.01
SWU-5773, 5774	9/30/2003	Gr. Beta	2.55 ± 0.63	2.83 ± 0.60	2.69 ± 0.44
AP-6102, 6103	9/30/2003	Be-7	0.07 ± 0.01	0.05 ± 0.01	0.06 ± 0.01
G-5631, 5632	10/1/2003	Be-7	1.88 ± 0.48	2.21 ± 0.40	2.05 ± 0.31
G-5631, 5632	10/1/2003	Gr. Beta	5.87 ± 0.09	5.85 ± 0.08	5.86 ± 0.06
G-5631, 5632	10/1/2003	K-40	5.24 ± 0.77	5.26 ± 0.58	5.25 ± 0.48
SO-5660, 5661	10/1/2003	Cs-137	0.15 ± 0.04	0.16 ± 0.05	0.16 ± 0.03
SO-5660, 5661	10/1/2003	Gr. Alpha	12.72 ± 3.72	14.86 ± 3.88	13.79 ± 2.69
SO-5660, 5661	10/1/2003	Gr. Beta	32.42 ± 3.09	33.60 ± 3.04	33.01 ± 2.17
SO-5660, 5661	10/1/2003	K-40	18.93 ± 0.87	18.25 ± 1.19	18.59 ± 0.74
SO-5660, 5661	10/1/2003	Sr-90	0.03 ± 0.01	0.03 ± 0.01	0.03 ± 0.01
AP-6334, 6335	10/1/2003	Be-7	0.06 ± 0.01	0.06 ± 0.01	0.06 ± 0.01
AP-6363, 6364	10/2/2003	Be-7	0.07 ± 0.02	0.07 ± 0.02	0.07 ± 0.01
MI-5794, 5795	10/6/2003	Sr-90	1.37 ± 0.37	1.02 ± 0.37	1.19 ± 0.26
MI-5838, 5839	10/8/2003	K-40	1364.30 ± 124.10	1414.40 ± 110.40	1389.35 ± 83.05
MI-5838, 5839	10/8/2003	Sr-90	0.76 ± 0.30	1.00 ± 0.34	0.88 ± 0.23
BS-5938, 5939	10/8/2003	Cs-137	0.18 ± 0.03	0.20 ± 0.05	0.19 ± 0.03
BS-5938, 5939	10/8/2003	K-40	15.59 ± 0.70	16.69 ± 0.80	16.14 ± 0.53
SS-5959, 5960	10/13/2003	K-40	7.49 ± 0.42	7.29 ± 0.63	7.39 ± 0.38
MI-6011, 6012	10/13/2003	K-40	1165.20 ± 118.70	1191.20 ± 99.50	1178.20 ± 77.44
MI-6034, 6035	10/14/2003	Sr-90	0.86 ± 0.33	0.90 ± 0.34	0.88 ± 0.24
VE-6055, 6056	10/15/2003	Gr. Beta	5.18 ± 0.18	5.33 ± 0.18	5.25 ± 0.13
VE-6055, 6056	10/15/2003	K-40	5.31 ± 0.57	4.52 ± 0.51	4.92 ± 0.38
MI-6291, 6292	10/21/2003	K-40	1935.60 ± 147.70	1936.10 ± 116.50	1935.85 ± 94.06
MI-6291, 6292	10/21/2003	Sr-90	1.22 ± 0.39	1.41 ± 0.37	1.31 ± 0.27
SS-6435, 6436	10/21/2003	Cs-137	0.05 ± 0.02	0.05 ± 0.03	0.05 ± 0.02
SS-6435, 6436	10/21/2003	K-40	14.08 ± 0.54	14.28 ± 0.80	14.18 ± 0.48
CF-6313, 6314	10/22/2003	K-40	14.56 ± 0.45	14.70 ± 0.95	14.63 ± 0.53
SO-6528, 6529	10/22/2003	Cs-137	0.15 ± 0.03	0.16 ± 0.05	0.16 ± 0.03
SO-6528, 6529	10/22/2003	K-40	17.46 ± 0.69	17.90 ± 1.05	17.68 ± 0.63
SO-6393, 6394	10/25/2003	Cs-137	0.09 ± 0.03	0.10 ± 0.04	0.10 ± 0.03
SO-6393, 6394	10/25/2003	Gr. Beta	23.21 ± 1.98	21.76 ± 1.91	22.48 ± 1.38
SO-6393, 6394	10/25/2003	K-40	13.98 ± 0.80	14.57 ± 0.86	14.27 ± 0.59
SWT-6507, 6508	10/28/2003	Gr. Beta	2.64 ± 0.52	2.63 ± 0.53	2.63 ± 0.37
DW-6647, 6648	10/31/2003	I-131	0.46 ± 0.27	0.61 ± 0.31	0.53 ± 0.21
BS-6603, 6604	11/3/2003	Cs-137	9.03 ± 0.82	8.60 ± 1.13	8.82 ± 0.70
BS-6603, 6604	11/3/2003	Gr. Beta	26.83 ± 1.94	27.18 ± 1.95	27.01 ± 1.38
SO-6670, 6671	11/5/2003	Cs-137	0.15 ± 0.04	0.13 ± 0.04	0.14 ± 0.03
SO-6670, 6671	11/5/2003	K-40	12.96 ± 0.66	12.95 ± 0.72	12.96 ± 0.49
S-7067, 7068	11/10/2003	Cs-137	0.21 ± 0.05	0.19 ± 0.08	0.20 ± 0.05
MI-6818, 6819	11/11/2003	K-40	1695.50 ± 129.80	1709.40 ± 143.00	1702.45 ± 96.56

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration (pCi/L)[a] First Result	Second Result	Averaged Result
MI-6818, 6819	11/11/2003	Sr-90	2.01 ± 0.41	1.59 ± 0.39	1.80 ± 0.28
WL-6987, 6988	11/17/2003	Fe-55	603.49 ± 53.32	619.65 ± 53.97	611.57 ± 37.93
SO-7156, 7157	11/21/2003	Cs-137	0.74 ± 0.08	0.77 ± 0.07	0.76 ± 0.06
SO-7156, 7157	11/21/2003	Gr. Alpha	14.90 ± 4.24	19.25 ± 4.45	17.07 ± 3.07
SO-7156, 7157	11/21/2003	Gr. Beta	22.97 ± 3.12	25.51 ± 2.98	24.24 ± 2.16
SO-7156, 7157	11/21/2003	K-40	12.51 ± 1.06	12.94 ± 1.07	12.73 ± 0.75
S-7281, 7282	11/24/2003	Cs-137	0.82 ± 0.15	1.16 ± 0.20	0.99 ± 0.12
SWU-7198, 7199	11/25/2003	Gr. Beta	2.60 ± 0.53	2.54 ± 0.55	2.57 ± 0.38
DW-7221, 7222	11/25/2003	Gr. Beta	12.32 ± 1.40	12.38 ± 1.43	12.35 ± 1.00
SW-7133, 7134	12/1/2003	Gr. Beta	2.10 ± 0.23	2.46 ± 0.23	2.28 ± 0.16
SW-7133, 7134	12/1/2003	K-40	1.50 ± 0.15	1.40 ± 0.14	1.45 ± 0.10
W-7519, 7520	12/1/2003	Fe-55	3.03 ± 0.65	3.12 ± 0.64	3.08 ± 0.46
SW-7805, 7806	12/1/2003	Sr-90	0.59 ± 0.32	0.56 ± 0.33	0.58 ± 0.23
VE-7399, 7400	12/9/2003	Gr. Beta	4.99 ± 0.15	5.24 ± 0.15	5.11 ± 0.11
VE-7399, 7400	12/9/2003	K-40	5.04 ± 0.46	5.34 ± 0.74	5.19 ± 0.43
SW-7540, 7541	12/9/2003	Gr. Alpha	2.64 ± 1.36	2.10 ± 1.19	2.37 ± 0.91
SW-7540, 7541	12/9/2003	Gr. Beta	6.62 ± 1.22	5.89 ± 1.35	6.25 ± 0.91
LW-7736, 7737	12/26/2003	Gr. Beta	2.62 ± 0.54	2.83 ± 0.56	2.73 ± 0.39
AP-7868, 7869	12/30/2003	Be-7	0.05 ± 0.01	0.04 ± 0.01	0.04 ± 0.01
AP-7952, 7953	12/30/2003	Be-7	0.04 ± 0.01	0.04 ± 0.01	0.04 ± 0.01
AP-7994, 7995	12/31/2003	Be-7	0.05 ± 0.02	0.05 ± 0.01	0.05 ± 0.01

Note: Duplicate analyses are performed on every twentieth sample received in-house. Results are not listed for those analyses with activities that measure below the LLD.

[a] Results are reported in units of pCi/L, except for air filters (pCi/Filter), food products, vegetation, soil, sediment (pCi/g).

[b] 200 minute count time or longer, resulting in lower error.

TABLE A-6. Department of Energy's Mixed Analyte Performance Evaluation Program (MAPEP)[a].

Lab Code	Type	Date	Analysis	Concentration[b] Laboratory result	Known Activity	Control Limits[c]
STW-972	water	12/01/02	Am-241	0.56 ± 0.06	0.58 ± 0.09	0.40 - 0.75
STW-972	water	12/01/02	Co-57	57.10 ± 1.90	57.00 ± 5.70	39.90 - 74.10
STW-972	water	12/01/02	Co-60	38.30 ± 0.60	38.20 ± 3.82	26.74 - 49.66
STW-972	water	12/01/02	Cs-134	395.30 ± 10.10	421.00 ± 42.10	294.70 - 547.30
STW-972	water	12/01/02	Cs-137	316.40 ± 5.30	329.00 ± 32.90	230.30 - 427.70
STW-972	water	12/01/02	Fe-55	94.90 ± 24.50	96.00 ± 9.60	67.20 - 124.80
STW-972	water	12/01/02	Mn-54	33.40 ± 0.10	32.90 ± 3.29	23.03 - 42.77
STW-972	water	12/01/02	Ni-63	123.80 ± 5.50	136.50 ± 13.70	95.55 - 177.45
STW-972	water	12/01/02	Pu-238	0.66 ± 0.06	0.83 ± 0.08	0.58 - 1.08
STW-972	water	12/01/02	Pu-239/40	0.001 ± 0.001	0.000 ± 0.000	0.000 - 0.005
STW-972	water	12/01/02	Sr-90	13.80 ± 1.00	12.31 ± 1.23	8.62 - 16.00
STW-972	water	12/01/02	Tc-99	128.10 ± 3.80	132.00 ± 13.20	92.40 - 171.60
STW-972	water	12/01/02	U-233/4	1.60 ± 0.09	1.54 ± 0.15	1.08 - 2.00
STW-972	water	12/01/02	U-238	1.64 ± 0.09	1.60 ± 0.16	1.12 - 2.08
STW-972	water	12/01/02	Zn-65	540.40 ± 9.90	516.00 ± 51.60	361.20 - 670.80
STSO-987	soil	01/01/03	Co-57	534.36 ± 2.61	530.00 ± 53.00	371.00 - 689.00
STSO-987	soil	01/01/03	Co-60	442.16 ± 2.31	420.00 ± 42.00	294.00 - 546.00
STSO-987	soil	01/01/03	Cs-134	211.00 ± 2.30	238.00 ± 23.80	166.60 - 309.40
STSO-987	soil	01/01/03	Cs-137	849.50 ± 3.30	832.00 ± 83.20	582.40 - 1081.60
STSO-987	soil	01/01/03	K-40	716.50 ± 12.80	652.00 ± 65.20	456.40 - 847.60
STSO-987	soil	01/01/03	Mn-54	148.76 ± 2.84	137.00 ± 13.70	95.90 - 178.10
STSO-987	soil	01/01/03	Ni-63	597.10 ± 23.50	770.00 ± 77.00	539.00 - 1001.00
STSO-987	soil	01/01/03	Pu-238	67.05 ± 3.10	66.90 ± 6.70	46.83 - 86.97
STSO-987	soil	01/01/03	Pu-239/40	52.80 ± 3.60	52.70 ± 5.30	36.90 - 68.50
STSO-987	soil	01/01/03	Sr-90	609.50 ± 9.80	714.00 ± 71.40	499.80 - 928.20
STSO-987	soil	01/01/03	U-233/4	99.50 ± 7.60	89.00 ± 8.90	62.30 - 115.70
STSO-987	soil	01/01/03	U-238	508.60 ± 42.20	421.00 ± 42.10	294.70 - 547.30
STSO-987	soil	01/01/03	Zn-65	492.70 ± 28.10	490.00 ± 49.00	343.00 - 637.00

[a] Results obtained by Environmental, Inc. ,Midwest Laboratory as a participant in the Department of Energy's Mixed Analyte Performance Evaluation Program, Idaho Operations office, Idaho Falls, Idaho

[b] All results are in Bq/kg or Bq/L as requested by the Department of Energy.

[c] MAPEP results are presented as the known values and expected laboratory precision (1 sigma, 1 determination) and control limits as defined by the MAPEP.

TABLE A-7. Environmental Measurements Laboratory Quality Assessment Program (EML)

Lab Code	Type	Date	Concentration[a] Analysis	Laboratory results	EML Result[b]	Control Limits[c]
STW-977	water	03/01/03	Gr. Alpha	304.30 ± 53.10	377.50	0.58 - 1.29
STW-977	water	03/01/03	Gr. Beta	615.80 ± 14.70	627.50	0.61 - 1.43
STW-978	water	03/01/03	Am-241	2.00 ± 0.10	2.13	0.79 - 1.41
STW-978	water	03/01/03	Co-60	221.30 ± 1.20	234.00	0.80 - 1.20
STW-978 [d]	water	03/01/03	Cs-134	23.30 ± 1.10	30.50	0.80 - 1.30
STW-978	water	03/01/03	Cs-137	61.40 ± 0.60	63.80	0.80 - 1.22
STW-978 [e]	water	03/01/03	H-3	341.90 ± 22.70	390.00	0.78 - 2.45
STW-978	water	03/01/03	Pu-238	3.70 ± 0.20	3.33	0.74 - 1.20
STW-978	water	03/01/03	Pu-239/40	4.40 ± 0.10	3.92	0.79 - 1.20
STW-978	water	03/01/03	Sr-90	4.60 ± 0.30	4.34	0.69 - 1.34
STW-978	water	03/01/03	Uranium	5.10 ± 0.60	4.29	0.75 - 1.33
STSO-979	soil	03/01/03	Ac-228	55.60 ± 2.50	57.60	0.80 - 1.38
STSO-979	soil	03/01/03	Am-241	12.42 ± 0.90	15.60	0.65 - 2.28
STSO-979	soil	03/01/03	Bi-212	57.70 ± 3.20	60.60	0.50 - 1.34
STSO-979	soil	03/01/03	Bi-214	60.40 ± 3.20	67.00	0.78 - 1.42
STSO-979	soil	03/01/03	Cs-137	1416.80 ± 70.00	1450.00	0.80 - 1.25
STSO-979	soil	03/01/03	K-40	653.80 ± 11.90	636.00	0.80 - 1.32
STSO-979	soil	03/01/03	Pb-212	51.10 ± 5.20	57.90	0.78 - 1.32
STSO-979	soil	03/01/03	Pb-214	64.70 ± 5.10	71.10	0.76 - 1.46
STSO-979	soil	03/01/03	Pu-239/40	24.40 ± 0.30	23.40	0.71 - 1.30
STSO-979	soil	03/01/03	Sr-90	54.50 ± 2.60	64.40	0.67 - 2.90
STSO-979	soil	03/01/03	Uranium	245.00 ± 1.50	249.00	0.71 - 1.32
STVE-980	Vegetation	03/01/03	Am-241	3.10 ± 0.20	3.51	0.73 - 2.02
STVE-980	Vegetation	03/01/03	Cm-244	1.40 ± 0.50	2.01	0.61 - 1.59
STVE-980	Vegetation	03/01/03	Co-60	12.60 ± 0.40	12.10	0.80 - 1.44
STVE-980	Vegetation	03/01/03	Cs-137	449.70 ± 6.20	444.00	0.80 - 1.31
STVE-980	Vegetation	03/01/03	K-40	1159.00 ± 38.60	1120.00	0.79 - 1.39
STVE-980	Vegetation	03/01/03	Pu-239/40	4.80 ± 0.40	5.17	0.69 - 1.31
STVE-980	Vegetation	03/01/03	Sr-90	659.70 ± 50.40	650.00	0.55 - 1.21
STAP-981	Air Filter	03/01/03	Am-241	0.27 ± 0.10	0.34	0.70 - 2.34
STAP-981	Air Filter	03/01/03	Co-60	30.20 ± 0.30	33.50	0.80 - 1.26
STAP-981	Air Filter	03/01/03	Cs-137	90.30 ± 1.30	99.70	0.80 - 1.32
STAP-981	Air Filter	03/01/03	Mn-54	41.80 ± 0.60	43.80	0.80 - 1.35
STAP-981	Air Filter	03/01/03	Pu-238	0.52 ± 0.10	0.52	0.67 - 1.33
STAP-981	Air Filter	03/01/03	Pu-239/40	0.35 ± 0.10	0.33	0.73 - 1.26
STAP-981	Air Filter	03/01/03	Sr-90	2.50 ± 0.10	2.80	0.53 - 1.84
STAP-981	Air Filter	03/01/03	Uranium	0.51 ± 0.10	0.50	0.79 - 2.10
STAP-982	Air Filter	03/01/03	Gr. Alpha	0.90 ± 0.10	1.17	0.73 - 1.43
STAP-982	Air Filter	03/01/03	Gr. Beta	1.50 ± 0.10	1.50	0.76 - 1.36

TABLE A-7. Environmental Measurements Laboratory Quality Assessment Program (EML)

Lab Code	Type	Date	Analysis	Concentration[a] Laboratory results	EML Result[b]	Control Limits[c]
STW-992	water	09/02/03	Am-241	9.78 ± 0.32	8.76	0.79 - 1.41
The September, 2003 results are preliminary. Control limits used were taken from the March, 2003 data. Control limits may vary slightly when the final study is published.						
STW-992	water	09/02/03	Co-60	468.30 ± 4.10	513.00	0.80 - 1.20
STW-992	water	09/02/03	Cs-134	53.90 ± 0.80	63.00	0.80 - 1.30
STW-992	water	09/02/03	Cs-137	76.10 ± 1.40	80.30	0.80 - 1.22
STW-992	water	09/02/03	H-3	355.20 ± 12.80	446.30	0.78 - 2.45
STW-992	water	09/02/03	Pu-238	1.71 ± 0.07	2.07	0.74 - 1.20
STW-992	water	09/02/03	Pu-239/40	4.24 ± 0.01	4.99	0.79 - 1.20
STW-992	water	09/02/03	Sr-90	6.70 ± 0.50	7.04	0.69 - 1.34
STW-992	water	09/02/03	Uranium	5.10 ± 0.60	5.69	0.75 - 1.33
STW-993	water	09/02/03	Gr. Alpha	688.00 ± 7.60	622.00	0.58 - 1.29
STW-993	water	09/02/03	Gr. Beta	1985.00 ± 111.00	1948.00	0.61 - 1.43
STSO-994	soil	09/02/03	Am-241	19.70 ± 1.50	18.40	0.65 - 2.28
STSO-994	soil	09/02/03	Cs-137	1928.00 ± 19.00	1973.00	0.80 - 1.25
STSO-994	soil	09/02/03	K-40	533.00 ± 79.00	488.00	0.80 - 1.32
STSO-994	soil	09/02/03	Pu-238	15.30 ± 0.80	14.60	0.59 - 2.88
STSO-994	soil	09/02/03	Pu-239/40	32.50 ± 2.30	30.40	0.71 - 1.30
STSO-994	soil	09/02/03	Sr-90	69.80 ± 2.30	80.30	0.67 - 2.90
STSO-994	soil	09/02/03	Uranium	228.30 ± 17.10	259.30	0.71 - 1.32
STAP-995	Air Filter	09/02/03	Am-241	0.64 ± 0.05	0.44	0.70 - 2.34
STAP-995	Air Filter	09/02/03	Co-60	48.50 ± 0.40	55.10	0.80 - 1.26
STAP-995	Air Filter	09/02/03	Cs-137	51.20 ± 1.10	54.80	0.80 - 1.32
STAP-995	Air Filter	09/02/03	Mn-54	53.70 ± 1.10	58.00	0.80 - 1.35
STAP-995	Air Filter	09/02/03	Pu-238	0.24 ± 0.05	0.23	0.67 - 1.33
STAP-995	Air Filter	09/02/03	Pu-239/40	0.41 ± 0.10	0.40	0.73 - 1.26
STAP-995	Air Filter	09/02/03	Sr-90	1.90 ± 0.10	2.06	0.53 - 1.84
STAP-995	Air Filter	09/02/03	Uranium	0.80 ± 0.06	0.82	0.79 - 2.10
STAP-996	Air Filter	09/02/03	Gr. Alpha	3.23 ± 0.07	3.11	0.73 - 1.43
STAP-996	Air Filter	09/02/03	Gr. Beta	4.18 ± 0.03	3.89	0.76 - 1.36

[a] Results are reported in Bq/L with the following exceptions: Air Filters (Bq/Filter), Soil and Vegetation (Bq/kg).

[b] The EML result listed is the mean of replicate determinations for each nuclide ± the standard error of the mean.

[c] Control limits are reported by EML as the ratio of Reported Value / EML value.

[d] A low bias for Cs-134 activity has been observed in the past. No errors have been found in the library or efficiency. Additional spike analyses will be performed and a correction factored into the calculation.

[e] Reporting error.

Appendix B

Summary Tables in the format of NRC Radiological Assessment Branch Technical Position
Revision 1, November 1979

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

Name of Facility: Wolf Creek Generating Station Docket No.: 50-482

Location of Facility: Coffey County, Kansas Reporting Period: Annual 2003

Medium of Pathway Sampled (Unit of Measurement)	Analysis and Total Number of Analysis Performed	ODCM Lower Limit of Detection (LLD)	All Indicator Locations ** Mean (f) ** Range	Indicator Location with Highest Annual Mean Name Distance and Direction	** Mean (f) ** Range	Control Locations ** Mean (f) ** Range	Number of Nonroutine Reported Measurements **
Air Particulate (pCi/m^3)	Gross Beta (299)	0.01	0.029 (208/208) (0.014-0.057)	18 3.0 miles SSE	0.031 (52/52) (0.014-0.056)	Stations 40 & 48 0.028 (91/91) (0.014-0.053)	0
	Gamma (23) Be-7	-	0.071 (16/16) (0.044-0.084)	37 2.0 miles NNW	0.073 (4/4) (0.070-0.076)	0.068 (7/7) (0.050-0.087)	0
	I-131 (299)	0.07	- (0/208)	N/A	N/A	- (0/91)	0
External Radiation (mR/day)	TLD (378)	-	0.217 (354/354) (0.126-0.266)	1 1.4 miles N	0.240 (8/8) (0.229-0.260)	Stations 39, 40 & 48 0.203 (24/24) (0.163-0.224)	0
Surface Water (pCi/l)	Gamma (36)		-(0/24)	N/A	N/A	JRR & MUSH -(0/12)	0
	Tritium (36)	3000	14978 (24/24) (11394-26793)	DC 0.6 miles WNW	15627 (12/12) (11409-26793)	-(0/12)	0
Ground Water (pCi/l)	I-131 (20)	1	-(0/16)	N/A	N/A	B-12 -(0/4)	0
	Gamma (20)		-(0/16)	N/A	N/A	-(0/4)	0
	Tritium (20)	3000	-(0/16)	N/A	N/A	-(0/4)	0

** Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses (f)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

Name of Facility: Wolf Creek Generating Station Docket No.: 50-482

Location of Facility: Coffey County, Kansas Reporting Period: Annual 2003

Medium of Pathway Sampled (Unit of Measurement)	Analysis and Total Number of Analysis Performed	ODCM Lower Limit of Detection (LLD)	All Indicator Locations ** Mean (f) ** Range	Indicator Location with Highest Annual Mean Name Distance and Direction	** Mean (f) ** Range	Control Locations ** Mean (f) ** Range	Number of Nonroutine Reported Measurements **
Drinking Water (pCi/l)	I-131 (36)	1	-(0-24)	N/A	N/A	BW-15 -(0/12)	0
	Gross Beta (36)	4	4.6 (24/24) (3.1-7.8)	NF-DW 17.5 miles SSE	4.9 (12/12) (3.1-7.8)	4.8 (12/12) (3.5-5.7)	0
	Gamma (36)		-(0/24)	N/A	N/A	-(0/12)	0
	Tritium (12)	2000	-(0/8)	N/A	N/A	-(0/4)	0
Shoreline Sediment (pCi/kg dry)	Gamma (6)					JRR	
	K-40	-	11127.8 (4/4) (10623-11677)	EEA 3.0 miles NNW	11321.0 (1/1)	8262.9 (2/2) (4565.7-11960.0)	0
	Cs-137		144.1 (1/4)	EEA 3.0 miles NNW	144.1 (1/1)	-(0/2)	
Fish (pCi/kg wet)	Gamma (16)					JRR	
	K-40	-	3109.8 (10/10) (2504.8-3725.8)	WCL 0.6 miles	3109.8 (10/10) (2504.8-3725.8)	3200.2 (6/6) (2734.5-3816.3)	0
	Tritium (16)	-	8670.2 (10/10) (5852-11620)	WCL 0.6 miles	8670.2 (10/10) (5852-11620)	-(0/6)	0

** Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses (f)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

Name of Facility: Wolf Creek Generating Station Docket No.: 50-482

Location of Facility: Coffey County, Kansas Reporting Period: Annual 2003

Medium of Pathway Sampled (Unit of Measurement)	Analysis and Total Number of Analysis Performed	ODCM Lower Limit of Detection (LLD)	All Indicator Locations ** Mean (f) ** Range	Indicator Location with Highest Annual Mean Name Distance and Direction	** Mean (f) ** Range	Control Locations ** Mean (f) ** Range	Number of Nonroutine Reported Measurements **
Broadleaf Vegetation (pCi/kg wet)	Gamma (21)					D-1 & S-4	
	Be-7	-	-(0/7)	N/A	N/A	293.9 (5/14) (214.1-379.5)	0
	K-40	-	3618.0 (7/7) (2292.9-4899.8)	N-1 2.4 miles W	3698.1 (2/2) (3369.5-4026.7)	3587.3 (14/14) (2110.9-6343.1)	0
						NR-U1	
Crops (pCi/kg wet)	Gamma (4)						
	K-40	-	6504.0 (3/3) (2457-14559)	NR-D2 11.5 miles S	8508.1 (2/2) (2457-14559)	3540.7 (1/1)	0
Bottom Sediment (pCi/kg dry)	Gamma (6)					JRR	
	K-40	-	11931.1 (4/4) (8981-14629)	DC 0.6 miles WNW	13067.5 (2/2) (11506-14629)	15948.5 (2/2) (14603-17294)	0
	Co-60	-	343.0 (2/4) (327.2-358.8)	DC 0.6 miles WNW	343.0 (2/2) (327.2-358.8)	- (0/2)	0
	Cs-137	-	205.5 (3/4) (69.1-310.2)	DC 0.6 miles WNW	273.7 (2/2) (237.1-310.2)	133.3 (2/2) (123.6-143.0)	0
Aquatic Vegetation (pCi/kg wet)	Gamma (1)					No Control	
	K-40	-	2440.8 (1/1)	EEA 3.0 miles NNW	2440.8 (1/1)		0

** Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses (f)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

Name of Facility: Wolf Creek Generating Station Docket No.: 50-482

Location of Facility: Coffey County, Kansas Reporting Period: Annual 2003

Medium of Pathway Sampled (Unit of Measurement)	Analysis and Total Number of Analysis Performed	ODCM Lower Limit of Detection (LLD)	All Indicator Locations ** Mean (f) ** Range	Indicator Location with Highest Annual Mean Name Distance and Direction	** Mean (f) ** Range	Control Locations ** Mean (f) ** Range	Number of Nonroutine Reported Measurements **
Terrestrial Vegetation (pCi/kg wet)	Gamma (1)					No Control	
	Be-7	-	865.1 (1/1)	EEA 3.0 miles NNW	865.1 (1/1)		0
	K-40		8657.3 (1/1)	EEA 3.0 miles NNW	8657.3 (1/1)		
Soil (pCi/kg dry)	Gamma (2)					No Control	
	K-40	-	10821.0 (2/2) (10080-11562)	MUDS 1.5 miles WNW	11562.0 (1/1)		0
	Cs-137	-	170.8 (2/2) (153.7-187.9)	EEA 3.0 miles NNW	187.9 (1/1)		0
Deer (pCi/kg wet)	Gamma (1)					No Control	
	K-40	-	2708.1 (1/1)	A2.1 2.1 miles N	2708.1 (1/1)		0

** Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses (f)

Appendix C

2003 Individual Sample Results

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters

STATION NUMBER 02

Collection Start Date	Collection Stop Date	Volume M^3	Gross Beta Activity (pCi/Cu.M.)
0102	0108	258	0.026+-0.004
0108	0115	297	0.026+-0.004
0115	0124	373	0.031+-0.003
0124	0130	231	0.047+-0.005
0130	0205	264	0.028+-0.004
0205	0213	344	0.029+-0.003
0213	0220	299	0.022+-0.004
0220	0226	250	0.029+-0.004
0226	0307	391	0.044+-0.003
0307	0313	258	0.043+-0.005
0313	0321	345	0.031+-0.003
0321	0326	215	0.023+-0.004
0326	0402	302	0.026+-0.004
0326*	0402	302	0.029+-0.004
0402	0409	305	0.017+-0.003
0409	0415	247	0.035+-0.004
0415	0422	302	0.018+-0.003
0422	0429	297	0.022+-0.003
0429	0507	341	0.021+-0.003
0507	0513	275	0.021+-0.003
0513	0520	301	0.016+-0.003
0520	0528	354	0.024+-0.003
0528	0604	313	0.017+-0.003
0604	0611	308	0.017+-0.003

*** Duplicate**

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters

STATION NUMBER 02

Collection Start Date	Collection Stop Date	Volume M^3	Gross Beta Activity (pCi/Cu.M.)
0611	0618	322	0.025+-0.003
0618	0625	302	0.024+-0.004
0625	0702	312	0.018+-0.003
0702	0709	298	0.025+-0.004
0709	0716	298	0.025+-0.004
0716	0723	289	0.021+-0.004
0723	0730	291	0.033+-0.004
0730	0806	309	0.028+-0.003
0806	0813	306	0.034+-0.004
0813	0820	294	0.029+-0.004
0820	0827	296	0.045+-0.005
0827	0903	304	0.018+-0.003
0903	0910	311	0.035+-0.004
0910	0917	327	0.022+-0.003
0917	0924	324	0.026+-0.004
0924	1001	308	0.022+-0.004
1001	1008	330	0.035+-0.003
1008	1016	357	0.025+-0.003
1016	1022	276	0.039+-0.005
1022	1029	325	0.025+-0.004
1029	1105	322	0.027+-0.004
1105	1112	323	0.050+-0.005
1112	1119	322	0.016+-0.003
1119	1125	250	0.036+-0.005
1125	1203	333	0.029+-0.004
1203	1211	335	0.033+-0.004

*** Duplicate**

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters

STATION NUMBER 02

Collection Start Date	Collection Stop Date	Volume M^3	Gross Beta Activity (pCi/Cu.M.)
1211	1217	247	0.038+-0.005
1217	1223	259	0.022+-0.004
1223	1230	295	0.025+-0.003

*** Duplicate**

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters

STATION NUMBER 18

Collection Start Date	Collection Stop Date	Volume M^3	Gross Beta Activity (pCi/Cu.M.)
0102	0108	265	0.030+-0.004
0108	0115	294	0.026+-0.004
0115	0124	387	0.035+-0.003
0124	0130	249	0.047+-0.005
0130	0205	258	0.036+-0.005
0205	0213	343	0.031+-0.003
0213	0220	309	0.017+-0.003
0220	0226	256	0.030+-0.004
0226	0307	388	0.044+-0.003
0307	0313	261	0.043+-0.005
0313	0321	342	0.025+-0.003
0321	0326	218	0.026+-0.004
0326	0402	302	0.030+-0.004
0402	0409	300	0.018+-0.003
0402*	0409	300	0.016+-0.003
0409	0415	240	0.037+-0.004
0415	0422	296	0.016+-0.003
0415*	0422	296	0.014+-0.003
0422	0429	296	0.021+-0.003
0429	0507	335	0.020+-0.003
0507	0513	250	0.024+-0.004
0507*	0513	250	0.020+-0.003
0513	0520	295	0.018+-0.003
0520	0528	342	0.026+-0.003

*** Duplicate**

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters

STATION NUMBER 18

Collection Start Date	Collection Stop Date	Volume M^3	Gross Beta Activity (pCi/Cu.M.)
0528	0604	302	0.017+-0.003
0604	0611	289	0.019+-0.003
0611	0618	306	0.029+-0.004
0618	0625	277	0.024+-0.004
0625	0702	283	0.025+-0.004
0702	0709	284	0.028+-0.004
0709	0716	278	0.027+-0.004
0709*	0716	278	0.024+-0.004
0716	0723	260	0.025+-0.004
0723	0730	282	0.031+-0.004
0730	0806	288	0.026+-0.003
0806	0813	292	0.034+-0.004
0813	0820	291	0.034+-0.004
0820	0827	315	0.045+-0.004
0827	0903	289	0.014+-0.003
0903	0910	288	0.035+-0.004
0910	0917	288	0.024+-0.003
0917	0924	301	0.028+-0.004
0924	1001	286	0.022+-0.004
1001	1008	297	0.039+-0.004
1008	1016	318	0.029+-0.003
1016	1022	253	0.042+-0.005
1022	1029	295	0.026+-0.004
1029	1105	292	0.032+-0.004
1105	1112	289	0.056+-0.005

*** Duplicate**

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters

STATION NUMBER 18

Collection Start Date	Collection Stop Date	Volume M^3	Gross Beta Activity (pCi/Cu.M.)
1112	1119	291	0.023+-0.004
1119	1125	250	0.034+-0.005
1125	1203	328	0.032+-0.004
1203	1211	341	0.037+-0.004
1211	1217	247	0.035+-0.005
1217	1223	260	0.022+-0.004
1223	1230	304	0.023+-0.003

*** Duplicate**

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters

STATION NUMBER 32

Collection Start Date	Collection Stop Date	Volume M^3	Gross Beta Activity (pCi/Cu.M.)
0102	0108	254	0.028+-0.004
0108	0115	289	0.031+-0.004
0115	0124	383	0.031+-0.003
0124	0130	236	0.044+-0.005
0130	0205	261	0.032+-0.004
0205	0213	348	0.033+-0.003
0213	0220	321	0.022+-0.003
0220	0226	265	0.032+-0.004
0226	0307	407	0.041+-0.003
0307	0313	274	0.041+-0.005
0313	0321	360	0.030+-0.003
0321	0326	232	0.024+-0.004
0326	0402	316	0.031+-0.004
0402	0409	320	0.018+-0.003
0409	0415	251	0.033+-0.004
0415	0422	327	0.017+-0.003
0422	0429	318	0.024+-0.003
0429	0507	363	0.025+-0.003
0507	0513	273	0.021+-0.003
0513	0520	303	0.017+-0.003
0520	0528	357	0.024+-0.003
0528	0604	318	0.019+-0.003
0604	0611	312	0.020+-0.003
0611	0618	326	0.026+-0.003

*** Duplicate**

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters

STATION NUMBER 32

Collection Start Date	Collection Stop Date	Volume M^3	Gross Beta Activity (pCi/Cu.M.)
0618	0625	309	0.022+-0.004
0625	0702	313	0.020+-0.003
0702	0709	312	0.026+-0.004
0709	0716	302	0.027+-0.004
0716	0723	275	0.023+-0.004
0723	0730	285	0.032+-0.004
0730	0806	279	0.032+-0.004
0806	0813	272	0.030+-0.004
0813	0820	276	0.034+-0.004
0820	0827	306	0.045+-0.004
0827	0903	301	0.016+-0.003
0903	0910	301	0.035+-0.004
0910*	0917	300	0.025+-0.003
0910	0917	300	0.023+-0.003
0917	0924	303	0.028+-0.004
0924	1001	291	0.026+-0.004
1001	1008	312	0.042+-0.004
1008	1016	330	0.029+-0.003
1016	1022	249	0.044+-0.005
1022	1029	294	0.026+-0.004
1029	1105	297	0.030+-0.004
1105	1112	299	0.054+-0.005
1112	1119	291	0.024+-0.004
1119	1125	255	0.040+-0.005
1125	1203	339	0.028+-0.003
1203	1211	349	0.036+-0.004

*** Duplicate**

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters

STATION NUMBER 32

Collection Start Date	Collection Stop Date	Volume M^3	Gross Beta Activity (pCi/Cu.M.)
1211	1217	249	0.036+-0.005
1217	1223	263	0.024+-0.004
1223	1230	299	0.024+-0.003

* Duplicate

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters

STATION NUMBER 37

Collection Start Date	Collection Stop Date	Volume M^3	Gross Beta Activity (pCi/Cu.M.)
0102	0108	255	0.031+-0.004
0108	0115	291	0.027+-0.004
0115	0124	380	0.029+-0.003
0124	0130	236	0.046+-0.005
0130	0205	263	0.030+-0.004
0205	0213	350	0.030+-0.003
0213	0220	309	0.019+-0.003
0220*	0226	250	0.031+-0.004
0220	0226	250	0.034+-0.005
0226	0307	390	0.047+-0.004
0307	0313	261	0.042+-0.005
0313	0321	340	0.023+-0.003
0321	0326	218	0.024+-0.004
0326	0402	302	0.030+-0.004
0402	0409	305	0.017+-0.003
0409	0415	247	0.033+-0.004
0415	0422	317	0.015+-0.003
0422	0429	298	0.019+-0.003
0429	0507	335	0.022+-0.003
0507	0513	260	0.021+-0.003
0513	0520	294	0.018+-0.003
0520	0528	340	0.023+-0.003
0528	0604	303	0.018+-0.003
0604	0611	293	0.016+-0.003

*** Duplicate**

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters

STATION NUMBER 37

Collection Start Date	Collection Stop Date	Volume M^3	Gross Beta Activity (pCi/Cu.M.)
0611	0618	302	0.028+-0.004
0618	0625	286	0.026+-0.004
0625	0702	303	0.021+-0.004
0702	0709	289	0.029+-0.004
0709	0716	303	0.024+-0.004
0716	0723	290	0.026+-0.004
0723	0730	297	0.029+-0.004
0730	0806	303	0.029+-0.003
0806	0813	302	0.035+-0.004
0813	0820	289	0.029+-0.004
0820	0827	306	0.047+-0.004
0827	0903	300	0.016+-0.003
0903*	0910	292	0.035+-0.004
0903	0910	292	0.035+-0.004
0910	0917	309	0.023+-0.003
0917	0924	300	0.029+-0.004
0924	1001	293	0.024+-0.004
1001	1008	300	0.043+-0.004
1008	1016	322	0.032+-0.003
1016	1022	254	0.048+-0.005
1022	1029	294	0.027+-0.004
1029	1105	292	0.030+-0.004
1105	1112	292	0.057+-0.005
1112	1119	288	0.024+-0.004
1119	1125	246	0.041+-0.005
1125	1203	333	0.038+-0.004

*** Duplicate**

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters

STATION NUMBER 37

Collection Start Date	Collection Stop Date	Volume M^3	Gross Beta Activity (pCi/Cu.M.)
1203	1211	347	0.035+-0.004
1211	1217	243	0.037+-0.005
1217	1223	255	0.025+-0.004
1223	1230	289	0.027+-0.003

*** Duplicate**

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters

STATION NUMBER 40

Collection Start Date	Collection Stop Date	Volume M^3	Gross Beta Activity (pCi/Cu.M.)
0102	0108	252	0.031+-0.004
0108	0115	282	0.030+-0.004
0115	0124	370	0.034+-0.004
0124	0130	240	0.051+-0.005
0130	0205	259	0.030+-0.004
0205	0213	347	0.034+-0.003
0205*	0213	347	0.034+-0.003
0213	0220	299	0.021+-0.003
0220	0226	240	0.030+-0.005
0226	0307	388	0.044+-0.003
0307	0313	260	0.045+-0.005
0313	0321	343	0.029+-0.003
0313*	0321	343	0.026+-0.003
0321	0326	218	0.026+-0.005
0326	0402	298	0.028+-0.004
0402	0409	295	0.017+-0.003
0409	0415	239	0.036+-0.004
0415	0422	302	0.014+-0.003
0422	0429	293	0.019+-0.003
0429	0507	318	0.026+-0.004
0507	0513	249	0.019+-0.003
0513	0520	293	0.018+-0.003
0520	0528	335	0.029+-0.003
0528	0604	293	0.020+-0.003

*** Duplicate**

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters

STATION NUMBER 40

Collection Start Date	Collection Stop Date	Volume M^3	Gross Beta Activity (pCi/Cu.M.)
0604	0611	286	0.016+-0.003
0611	0618	296	0.029+-0.004
0618	0625	275	0.022+-0.004
0618*	0625	275	0.022+-0.004
0625	0702	287	0.020+-0.004
0702	0709	285	0.027+-0.004
0702*	0709	285	0.025+-0.004
0709	0716	291	0.023+-0.004
0716	0723	270	0.026+-0.004
0723	0730	289	0.033+-0.004
0730	0806	296	0.031+-0.004
0730*	0806	296	0.033+-0.004
0806	0813	297	0.038+-0.004
0813	0820	291	0.032+-0.004
0820	0827	316	0.045+-0.004
0827	0903	296	0.015+-0.003
0903	0910	289	0.037+-0.004
0910	0917	302	0.024+-0.003
0917	0924	295	0.028+-0.004
0924	1001	291	0.020+-0.004

*** Duplicate**

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters

STATION NUMBER 48

Collection Start Date	Collection Stop Date	Volume M^3	Gross Beta Activity (pCi/Cu.M.)
0102	0108	264	0.029+-0.004
0108	0115	299	0.031+-0.004
0115	0124	380	0.030+-0.003
0124	0130	232	0.046+-0.005
0130	0205	250	0.027+-0.004
0205	0213	331	0.031+-0.003
0213	0220	279	0.018+-0.003
0220	0226	245	0.030+-0.004
0226	0307	364	0.038+-0.003
0307	0313	255	0.041+-0.005
0313	0321	343	0.024+-0.003
0321	0326	218	0.027+-0.005
0326	0402	292	0.029+-0.004
0402	0409	300	0.016+-0.003
0409	0415	237	0.040+-0.004
0415	0422	300	0.015+-0.003
0422	0429	300	0.021+-0.003
0429	0507	336	0.022+-0.003
0507	0513	255	0.021+-0.003
0513	0520	278	0.020+-0.003
0520	0528	336	0.026+-0.003

*** Duplicate**

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters

STATION NUMBER 48

Collection Start Date	Collection Stop Date	Volume M^3	Gross Beta Activity (pCi/Cu.M.)
0528	0604	292	0.018+-0.003
0604	0611	302	0.016+-0.003
0611	0618	306	0.026+-0.004
0618	0625	275	0.023+-0.004
0625	0702	283	0.024+-0.004
0702	0709	286	0.024+-0.004
0709	0716	296	0.025+-0.004
0716	0723	265	0.024+-0.004
0723	0730	288	0.034+-0.004
0730	0806	291	0.033+-0.004
0806	0813	302	0.033+-0.004
0813	0820	301	0.034+-0.004
0820	0827	300	0.040+-0.004
0827	0903	293	0.016+-0.003
0903	0910	285	0.031+-0.004
0910	0917	296	0.024+-0.003
0917	0924	302	0.026+-0.004
0924	1001	286	0.022+-0.004
1001	1008	292	0.036+-0.004
1008	1016	328	0.028+-0.003
1016	1022	249	0.043+-0.005
1022	1029	284	0.023+-0.004
1029	1105	284	0.029+-0.004

*** Duplicate**

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters

STATION NUMBER 48

Collection Start Date	Collection Stop Date	Volume M^3	Gross Beta Activity (pCi/Cu.M.)
1105	1112	286	0.053+-0.005
1112	1119	281	0.025+-0.004
1119	1125	249	0.038+-0.005
1125	1203	324	0.032+-0.004
1203	1211	305	0.035+-0.004
1211	1217	239	0.038+-0.005
1217	1223	252	0.022+-0.004
1223	1230	282	0.026+-0.003

* Duplicate

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters
Isotopic Analysis on Quarterly Composite
(pCi/ Cu.M.)
STATION NUMBER 02
Gamma Spectrum Analysis
Dates Listed are Collection Start Dates

0102	AIR PARTICULATES	0702	AIR PARTICULATES
BE-7	0.072+-0.011	BE-7	0.075+-0.018
MN-54	<0.001	MN-54	<0.001
CO-58	<0.001	CO-58	<0.001
FE-59	<0.001	FE-59	<0.001
CO-60	<0.001	CO-60	<0.001
ZN-65	<0.001	ZN-65	<0.001
ZR-95	<0.001	ZR-95	<0.001
CS-134	<0.001	CS-134	<0.001
CS-137	<0.001	CS-137	<0.001
0402	AIR PARTICULATES	1001	AIR PARTICULATES
BE-7	0.082+-0.015	BE-7	0.044+-0.010
MN-54	<0.001	MN-54	<0.001
CO-58	<0.001	CO-58	<0.001
FE-59	<0.001	FE-59	<0.001
CO-60	<0.001	CO-60	<0.001
ZN-65	<0.001	ZN-65	<0.001
ZR-95	<0.001	ZR-95	<0.001
CS-134	<0.001	CS-134	<0.001
CS-137	<0.001	CS-137	<0.001

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters
Isotopic Analysis on Quarterly Composite
(pCi/ Cu.M.)
STATION NUMBER 18
Gamma Spectrum Analysis
Dates Listed are Collection Start Dates

0102	AIR PARTICULATES	0702	AIR PARTICULATES
BE-7	0.065+-0.014	BE-7	0.084+-0.013
MN-54	<0.001	MN-54	<0.001
CO-58	<0.001	CO-58	<0.001
FE-59	<0.001	FE-59	<0.001
CO-60	<0.001	CO-60	<0.001
ZN-65	<0.001	ZN-65	<0.001
ZR-95	<0.001	ZR-95	<0.001
CS-134	<0.001	CS-134	<0.001
CS-137	<0.001	CS-137	<0.001
0402	AIR PARTICULATES	1001	AIR PARTICULATES
BE-7	0.079+-0.013	BE-7	0.062+-0.014
MN-54	<0.001	MN-54	<0.001
CO-58	<0.001	CO-58	<0.001
FE-59	<0.001	FE-59	<0.001
CO-60	<0.001	CO-60	<0.001
ZN-65	<0.001	ZN-65	<0.001
ZR-95	<0.001	ZR-95	<0.001
CS-134	<0.001	CS-134	<0.001
CS-137	<0.001	CS-137	<0.001

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters
Isotopic Analysis on Quarterly Composite
(pCi/ Cu.M.)
STATION NUMBER 32
Gamma Spectrum Analysis
Dates Listed are Collection Start Dates

0102	AIR PARTICULATES	0702	AIR PARTICULATES
BE-7	0.064+-0.014	BE-7	0.079+-0.017
MN-54	<0.001	MN-54	<0.001
CO-58	<0.001	CO-58	<0.001
FE-59	<0.001	FE-59	<0.001
CO-60	<0.001	CO-60	<0.001
ZN-65	<0.001	ZN-65	<0.001
ZR-95	<0.001	ZR-95	<0.001
CS-134	<0.001	CS-134	<0.001
CS-137	<0.001	CS-137	<0.001
0402	AIR PARTICULATES	1001	AIR PARTICULATES
BE-7	0.081+-0.016	BE-7	0.056+-0.015
MN-54	<0.001	MN-54	<0.001
CO-58	<0.001	CO-58	<0.001
FE-59	<0.001	FE-59	<0.001
CO-60	<0.001	CO-60	<0.001
ZN-65	<0.001	ZN-65	<0.001
ZR-95	<0.001	ZR-95	<0.001
CS-134	<0.001	CS-134	<0.001
CS-137	<0.001	CS-137	<0.001

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters
Isotopic Analysis on Quarterly Composite
(pCi/ Cu.M.)
STATION NUMBER 37
Gamma Spectrum Analysis
Dates Listed are Collection Start Dates

0102	AIR PARTICULATES	0702	AIR PARTICULATES
BE-7	0.075+-0.012	BE-7	0.076+-0.016
MN-54	<0.001	MN-54	<0.001
CO-58	<0.001	CO-58	<0.001
FE-59	<0.001	FE-59	<0.001
CO-60	<0.001	CO-60	<0.001
ZN-65	<0.001	ZN-65	<0.001
ZR-95	<0.001	ZR-95	<0.001
CS-134	<0.001	CS-134	<0.001
CS-137	<0.001	CS-137	<0.001
0402	AIR PARTICULATES	1001	AIR PARTICULATES
BE-7	0.072+-0.015	BE-7	0.070+-0.018
MN-54	<0.001	MN-54	<0.001
CO-58	<0.001	CO-58	<0.001
FE-59	<0.001	FE-59	<0.001
CO-60	<0.001	CO-60	<0.001
ZN-65	<0.001	ZN-65	<0.001
ZR-95	<0.001	ZR-95	<0.001
CS-134	<0.001	CS-134	<0.001
CS-137	<0.001	CS-137	<0.001

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters
Isotopic Analysis on Quarterly Composite
(pCi/ Cu.M.)
STATION NUMBER 40
Gamma Spectrum Analysis
Dates Listed are Collection Start Dates

0102	AIR PARTICULATES	0702	AIR PARTICULATES
BE-7	0.072+-0.012	BE-7	0.087+-0.017
MN-54	<0.001	MN-54	<0.001
CO-58	<0.001	CO-58	<0.001
FE-59	<0.001	FE-59	<0.001
CO-60	<0.001	CO-60	<0.001
ZN-65	<0.001	ZN-65	<0.001
ZR-95	<0.001	ZR-95	<0.001
CS-134	<0.001	CS-134	<0.001
CS-137	<0.001	CS-137	<0.001

0402	AIR PARTICULATES
BE-7	0.083+-0.015
MN-54	<0.001
CO-58	<0.001
FE-59	<0.001
CO-60	<0.001
ZN-65	<0.001
ZR-95	<0.001
CS-134	<0.001
CS-137	<0.001

Wolf Creek Nuclear Operating Corporation

Air Particulate Filters
Isotopic Analysis on Quarterly Composite
(pCi/ Cu.M.)
STATION NUMBER 48
Gamma Spectrum Analysis
Dates Listed are Collection Start Dates

0102	AIR PARTICULATES	0702	AIR PARTICULATES
BE-7	0.056+-0.012	BE-7	0.057+-0.013
MN-54	<0.001	MN-54	<0.001
CO-58	<0.001	CO-58	<0.001
FE-59	<0.001	FE-59	<0.001
CO-60	<0.001	CO-60	<0.001
ZN-65	<0.001	ZN-65	<0.001
ZR-95	<0.001	ZR-95	<0.001
CS-134	<0.001	CS-134	<0.001
CS-137	<0.001	CS-137	<0.001
0402	AIR PARTICULATES	1001	AIR PARTICULATES
BE-7	0.070+-0.013	BE-7	0.050+-0.013
MN-54	<0.001	MN-54	<0.001
CO-58	<0.001	CO-58	<0.001
FE-59	<0.001	FE-59	<0.001
CO-60	<0.001	CO-60	<0.001
ZN-65	<0.001	ZN-65	<0.001
ZR-95	<0.001	ZR-95	<0.001
CS-134	<0.001	CS-134	<0.001
CS-137	<0.001	CS-137	<0.001

Wolf Creek Nuclear Operating Corporation

Charcoal Filters

STATION NUMBER 02

Collection Start Date	Collection Stop Date	Volume M^3	I-131 Activity (pCi/Cu.M.)
0102	0108	258	<0.011
0108	0115	297	<0.010
0115	0124	373	<0.010
0124	0130	231	<0.018
0130	0205	264	<0.011
0205	0213	344	<0.008
0213	0220	299	<0.009
0220	0226	250	<0.012
0226	0307	391	<0.008
0307	0313	258	<0.008
0313	0321	345	<0.008
0321	0326	215	<0.015
0326	0402	302	<0.009
0402	0409	305	<0.005
0409	0415	247	<0.013
0415	0422	302	<0.007
0422	0429	297	<0.010
0429	0507	341	<0.008
0507	0513	275	<0.009
0513	0520	301	<0.010
0520	0528	354	<0.004
0528	0604	313	<0.009
0604	0611	308	<0.004
0611	0618	322	<0.018
0618	0625	302	<0.018
0625	0702	312	<0.018
0702	0709	298	<0.014
0709	0716	298	<0.014

Wolf Creek Nuclear Operating Corporation

Charcoal Filters

STATION NUMBER 02

Collection Start Date	Collection Stop Date	Volume M^3	I-131 Activity (pCi/Cu.M.)
0716	0723	289	<0.009
0723	0730	291	<0.022
0730	0806	309	<0.016
0806	0813	306	<0.007
0813	0820	294	<0.014
0820	0827	296	<0.011
0827	0903	304	<0.014
0903	0910	311	<0.007
0910	0917	327	<0.010
0917	0924	324	<0.016
0924	1001	308	<0.019
1001	1008	330	<0.010
1008	1016	357	<0.011
1016	1022	276	<0.015
1022	1029	325	<0.011
1029	1105	322	<0.011
1105	1112	323	<0.015
1112	1119	322	<0.017
1119	1125	250	<0.024
1125	1203	333	<0.012
1203	1211	335	<0.015
1211	1217	247	<0.023
1217	1223	259	<0.014
1223	1230	295	<0.014

Wolf Creek Nuclear Operating Corporation

Charcoal Filters

STATION NUMBER 18

Collection Start Date	Collection Stop Date	Volume M^3	I-131 Activity (pCi/Cu.M.)
0102	0108	265	<0.011
0108	0115	294	<0.010
0115	0124	387	<0.009
0124	0130	249	<0.017
0130	0205	258	<0.012
0205	0213	343	<0.008
0213	0220	309	<0.009
0220	0226	256	<0.011
0226	0307	388	<0.008
0307	0313	261	<0.008
0313	0321	342	<0.009
0321	0326	218	<0.015
0326	0402	302	<0.009
0402	0409	300	<0.005
0409	0415	240	<0.013
0415	0422	296	<0.007
0422	0429	296	<0.010
0429	0507	335	<0.008
0507	0513	250	<0.010
0513	0520	295	<0.010
0520	0528	342	<0.004
0528	0604	302	<0.009
0604	0611	289	<0.005
0611	0618	306	<0.019
0618	0625	277	<0.020
0625	0702	283	<0.020
0702	0709	284	<0.014
0709	0716	278	<0.014

Wolf Creek Nuclear Operating Corporation

Charcoal Filters

STATION NUMBER 18

Collection Start Date	Collection Stop Date	Volume M^3	I-131 Activity (pCi/Cu.M.)
0716	0723	260	<0.010
0723	0730	282	<0.023
0730	0806	288	<0.017
0806	0813	292	<0.007
0813	0820	291	<0.014
0820	0827	315	<0.010
0827	0903	289	<0.015
0903	0910	288	<0.007
0910	0917	288	<0.011
0917	0924	301	<0.018
0924	1001	286	<0.021
1001	1008	297	<0.011
1008	1016	318	<0.012
1016	1022	253	<0.016
1022	1029	295	<0.013
1029	1105	292	<0.012
1105	1112	289	<0.016
1112	1119	291	<0.018
1119	1125	250	<0.024
1125	1203	328	<0.012
1203	1211	341	<0.015
1211	1217	247	<0.023
1217	1223	260	<0.014
1223	1230	304	<0.013

Wolf Creek Nuclear Operating Corporation

Charcoal Filters

STATION NUMBER 32

Collection Start Date	Collection Stop Date	Volume M^3	I-131 Activity (pCi/Cu.M.)
0102	0108	254	<0.012
0108	0115	289	<0.010
0115	0124	383	<0.010
0124	0130	236	<0.018
0130	0205	261	<0.011
0205	0213	348	<0.008
0213	0220	321	<0.008
0220	0226	265	<0.011
0226	0307	407	<0.008
0307	0313	274	<0.008
0313	0321	360	<0.008
0321	0326	232	<0.014
0326	0402	316	<0.008
0402	0409	320	<0.005
0409	0415	251	<0.013
0415	0422	327	<0.006
0422	0429	318	<0.010
0429	0507	363	<0.008
0507	0513	273	<0.009
0513	0520	303	<0.010
0520	0528	357	<0.004
0528	0604	318	<0.009
0604	0611	312	<0.004
0611	0618	326	<0.018
0618	0625	309	<0.018
0625	0702	313	<0.018
0702	0709	312	<0.013
0709	0716	302	<0.013

Wolf Creek Nuclear Operating Corporation

Charcoal Filters

STATION NUMBER 32

Collection Start Date	Collection Stop Date	Volume M^3	I-131 Activity (pCi/Cu.M.)
0716	0723	275	<0.009
0723	0730	285	<0.023
0730	0806	279	<0.017
0806	0813	272	<0.007
0813	0820	276	<0.015
0820	0827	306	<0.011
0827	0903	301	<0.014
0903	0910	301	<0.007
0910	0917	300	<0.011
0917	0924	303	<0.018
0924	1001	291	<0.020
1001	1008	312	<0.011
1008	1016	330	<0.012
1016	1022	249	<0.016
1022	1029	294	<0.013
1029	1105	297	<0.012
1105	1112	299	<0.016
1112	1119	291	<0.018
1119	1125	255	<0.023
1125	1203	339	<0.011
1203	1211	349	<0.015
1211	1217	249	<0.023
1217	1223	263	<0.014
1223	1230	299	<0.014

Wolf Creek Nuclear Operating Corporation

Charcoal Filters

STATION NUMBER 37

Collection Start Date	Collection Stop Date	Volume M^3	I-131 Activity (pCi/Cu.M.)
0102	0108	255	<0.012
0108	0115	291	<0.010
0115	0124	380	<0.010
0124	0130	236	<0.018
0130	0205	263	<0.011
0205	0213	350	<0.008
0213	0220	309	<0.009
0220	0226	250	<0.012
0226	0307	390	<0.008
0307	0313	261	<0.008
0313	0321	340	<0.009
0321	0326	218	<0.015
0326	0402	302	<0.009
0402	0409	305	<0.005
0409	0415	247	<0.013
0415	0422	317	<0.006
0422	0429	298	<0.010
0429	0507	335	<0.008
0507	0513	260	<0.010
0513	0520	294	<0.010
0520	0528	340	<0.004
0528	0604	303	<0.009
0604	0611	293	<0.005
0611	0618	302	<0.019
0618	0625	286	<0.019
0625	0702	303	<0.019
0702	0709	289	<0.014
0709	0716	303	<0.013

Wolf Creek Nuclear Operating Corporation

Charcoal Filters

STATION NUMBER 37

Collection Start Date	Collection Stop Date	Volume M^3	I-131 Activity (pCi/Cu.M.)
0716	0723	290	<0.009
0723	0730	297	<0.022
0730	0806	303	<0.016
0806	0813	302	<0.007
0813	0820	289	<0.014
0820	0827	306	<0.011
0827	0903	300	<0.014
0903*	0910	292	<0.007
0903	0910	292	<0.007
0910	0917	309	<0.010
0917	0924	300	<0.018
0924	1001	293	<0.020
1001	1008	300	<0.011
1008	1016	322	<0.012
1016	1022	254	<0.016
1022	1029	294	<0.013
1029	1105	292	<0.012
1105	1112	292	<0.016
1112	1119	288	<0.019
1119	1125	246	<0.024
1125	1203	333	<0.012
1203	1211	347	<0.015
1211	1217	243	<0.023
1217	1223	255	<0.015
1223	1230	289	<0.014

Wolf Creek Nuclear Operating Corporation

Charcoal Filters

STATION NUMBER 40

Collection Start Date	Collection Stop Date	Volume M^3	I-131 Activity (pCi/Cu.M.)
0102	0108	252	<0.012
0108	0115	282	<0.010
0115	0124	370	<0.010
0124	0130	240	<0.017
0130	0205	259	<0.011
0205	0213	347	<0.008
0213	0220	299	<0.009
0220	0226	240	<0.012
0226	0307	388	<0.008
0307	0313	260	<0.008
0313	0321	343	<0.009
0321	0326	218	<0.015
0326	0402	298	<0.009
0402	0409	295	<0.005
0409	0415	239	<0.013
0415	0422	302	<0.007
0422	0429	293	<0.010
0429	0507	318	<0.009
0507	0513	249	<0.010
0513	0520	293	<0.011
0520	0528	335	<0.004
0528	0604	293	<0.010
0604	0611	286	<0.005
0611	0618	296	<0.020
0618	0625	275	<0.020
0625	0702	287	<0.020
0702	0709	285	<0.014
0709	0716	291	<0.014

Wolf Creek Nuclear Operating Corporation

Charcoal Filters

STATION NUMBER 40

Collection Start Date	Collection Stop Date	Volume M^3	I-131 Activity (pCi/Cu.M.)
0716	0723	270	<0.010
0723	0730	289	<0.023
0730	0806	296	<0.016
0806	0813	297	<0.007
0813	0820	291	<0.014
0820	0827	316	<0.010
0827	0903	296	<0.014
0903	0910	289	<0.007
0910	0917	302	<0.010
0917	0924	295	<0.018
0924	1001	291	<0.020

Wolf Creek Nuclear Operating Corporation

Charcoal Filters

STATION NUMBER 48

Collection Start Date	Collection Stop Date	Volume M^3	I-131 Activity (pCi/Cu.M.)
0102	0108	264	<0.011
0108	0115	299	<0.009
0115	0124	380	<0.010
0124	0130	232	<0.018
0130	0205	250	<0.012
0205	0213	331	<0.008
0213	0220	279	<0.010
0220	0226	245	<0.012
0226	0307	364	<0.009
0307	0313	255	<0.008
0313	0321	343	<0.009
0321	0326	218	<0.015
0326	0402	292	<0.009
0402	0409	300	<0.005
0409	0415	237	<0.013
0415	0422	300	<0.007
0422	0429	300	<0.010
0429	0507	336	<0.008
0507	0513	255	<0.010
0513	0520	278	<0.011
0520	0528	336	<0.004
0528	0604	292	<0.010
0604	0611	302	<0.004
0611	0618	306	<0.019
0618	0625	275	<0.020
0625	0702	283	<0.020
0702	0709	286	<0.014
0709	0716	296	<0.014

Wolf Creek Nuclear Operating Corporation

Charcoal Filters

STATION NUMBER 48

Collection Start Date	Collection Stop Date	Volume M^3	I-131 Activity (pCi/Cu.M.)
0716	0723	265	<0.010
0723	0730	288	<0.023
0730	0806	291	<0.017
0806	0813	302	<0.007
0813	0820	301	<0.013
0820	0827	300	<0.011
0827	0903	293	<0.014
0903	0910	285	<0.008
0910	0917	296	<0.011
0917	0924	302	<0.018
0924	1001	286	<0.021
1001	1008	292	<0.012
1008	1016	328	<0.012
1016	1022	249	<0.016
1022	1029	284	<0.013
1029	1105	284	<0.013
1105	1112	286	<0.017
1112	1119	281	<0.019
1119	1125	249	<0.024
1125	1203	324	<0.012
1203	1211	305	<0.017
1211	1217	239	<0.024
1217	1223	252	<0.015
1223	1230	282	<0.014

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Surface Water
(pCi/Liter)
STATION NUMBER DC
Gamma Spectrum and Tritium Analysis

SURFACE WATER	0130	SURFACE WATER	0220	SURFACE WATER	0320
MN-54	<2.8	MN-54	<3.7	MN-54	<2.9
CO-58	<3.0	CO-58	<3.0	CO-58	<4.2
FE-59	<3.9	FE-59	<7.9	FE-59	<8.1
CO-60	<2.4	CO-60	<3.1	CO-60	<3.3
ZN-65	<4.2	ZN-65	<5.6	ZN-65	<3.2
ZR-95	<1.8	ZR-95	<6.5	ZR-95	<4.2
I-131	<2.8	I-131	<9.6	I-131	<5.6
CS-134	<2.9	CS-134	<5.6	CS-134	<4.8
CS-137	<3.2	CS-137	<3.9	CS-137	<4.9
BA-140	<3.8	BA-140	<3.3	BA-140	<4.3
H-3	13599+-334	H-3	14233+-330	H-3	13543+-329

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Surface Water
(pCi/Liter)
STATION NUMBER DC
Gamma Spectrum and Tritium Analysis

SURFACE WATER	0417	SURFACE WATER	0515	SURFACE WATER	0619
MN-54	<2.6	MN-54	<3.7	MN-54	<3.3
CO-58	<3.6	CO-58	<2.5	CO-58	<2.8
FE-59	<3.6	FE-59	<4.2	FE-59	<5.5
CO-60	<3.0	CO-60	<2.9	CO-60	<2.3
ZN-65	<3.1	ZN-65	<4.7	ZN-65	<6.9
ZR-95	<1.8	ZR-95	<3.5	ZR-95	<3.5
I-131	<4.4	I-131	<13.6	I-131	<8.0
CS-134	<2.6	CS-134	<3.2	CS-134	<3.9
CS-137	<3.7	CS-137	<4.5	CS-137	<4.7
BA-140	<3.4	BA-140	<5.5	BA-140	<3.8
H-3	12858+-321	H-3	13996+-321	H-3	11409+-305

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Surface Water
(pCi/Liter)
STATION NUMBER DC
Gamma Spectrum and Tritium Analysis

SURFACE WATER	0717	SURFACE WATER	0821	SURFACE WATER	0918
MN-54	<2.8	MN-54	<1.2	MN-54	<3.0
CO-58	<2.7	CO-58	<2.1	CO-58	<3.3
FE-59	<7.9	FE-59	<3.6	FE-59	<5.8
CO-60	<3.3	CO-60	<1.3	CO-60	<2.2
ZN-65	<3.0	ZN-65	<3.2	ZN-65	<6.7
ZR-95	<2.9	ZR-95	<2.3	ZR-95	<4.4
I-131	<6.8	I-131	<2.9	I-131	<5.8
CS-134	<4.5	CS-134	<2.2	CS-134	<3.1
CS-137	<3.1	CS-137	<1.9	CS-137	<4.1
BA-140	<6.8	BA-140	<3.1	BA-140	<3.5
H-3	13040+-326	H-3	26793+-458	H-3	16721+-374

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Surface Water
(pCi/Liter)
STATION NUMBER DC
Gamma Spectrum and Tritium Analysis

SURFACE WATER	1016	SURFACE WATER	1120	SURFACE WATER	1219
MN-54	<4.0	MN-54	<3.0	MN-54	<4.4
CO-58	<3.6	CO-58	<3.4	CO-58	<2.7
FE-59	<11.0	FE-59	<4.5	FE-59	<6.4
CO-60	<6.3	CO-60	<1.9	CO-60	<4.8
ZN-65	<6.4	ZN-65	<5.0	ZN-65	<14.6
ZR-95	<4.9	ZR-95	<3.0	ZR-95	<3.6
I-131	<10.6	I-131	<6.6	I-131	<6.5
CS-134	<5.7	CS-134	<3.4	CS-134	<4.1
CS-137	<3.9	CS-137	<3.7	CS-137	<5.1
BA-140	<7.4	BA-140	<2.2	BA-140	<6.9
H-3	17551+-385	H-3	17087+-373	H-3	16699+-377

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Surface Water
(pCi/Liter)
STATION NUMBER JRR
Gamma Spectrum and Tritium Analysis

SURFACE WATER	0619	SURFACE WATER	0717	SURFACE WATER	0821
MN-54	<4.0	MN-54	<2.9	MN-54	<1.4
CO-58	<3.2	CO-58	<1.8	CO-58	<1.9
FE-59	<5.6	FE-59	<4.5	FE-59	<2.5
CO-60	<5.0	CO-60	<1.6	CO-60	<1.3
ZN-65	<4.1	ZN-65	<2.1	ZN-65	<3.1
ZR-95	<4.2	ZR-95	<2.9	ZR-95	<1.6
I-131	<8.9	I-131	<6.2	I-131	<3.2
CS-134	<3.4	CS-134	<2.5	CS-134	<1.9
CS-137	<6.4	CS-137	<2.6	CS-137	<1.2
BA-140	<3.3	BA-140	<3.0	BA-140	<3.1
H-3	<163	H-3	<158	H-3	<157

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Surface Water
(pCi/Liter)
STATION NUMBER JRR
Gamma Spectrum and Tritium Analysis

SURFACE WATER	0918	SURFACE WATER	1016	SURFACE WATER	1120
MN-54	<3.5	MN-54	<4.7	MN-54	<2.5
CO-58	<5.0	CO-58	<4.3	CO-58	<1.3
FE-59	<3.9	FE-59	<4.7	FE-59	<4.6
CO-60	<5.0	CO-60	<3.9	CO-60	<2.2
ZN-65	<8.6	ZN-65	<4.9	ZN-65	<4.9
ZR-95	<3.3	ZR-95	<3.6	ZR-95	<3.3
I-131	<6.7	I-131	<6.6	I-131	<4.8
CS-134	<3.9	CS-134	<5.6	CS-134	<2.3
CS-137	<4.8	CS-137	<3.3	CS-137	<2.5
BA-140	<6.5	BA-140	<3.5	BA-140	<2.5
H-3	<166	H-3	<162	H-3	<157

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne

Surface Water

(pCi/Liter)

STATION NUMBER JRR

Gamma Spectrum and Tritium Analysis

SURFACE WATER	1219	SURFACE WATER DUP	1016
MN-54	<2.0	MN-54	<4.8
CO-58	<1.6	CO-58	<3.4
FE-59	<4.6	FE-59	<7.4
CO-60	<2.4	CO-60	<4.1
ZN-65	<2.5	ZN-65	<4.7
ZR-95	<3.1	ZR-95	<3.8
I-131	<5.3	I-131	<8.7
CS-134	<3.6	CS-134	<4.1
CS-137	<3.0	CS-137	<5.8
BA-140	<3.0	BA-140	<3.5
H-3	<169	H-3	<162

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Surface Water
(pCi/Liter)
STATION NUMBER MUSH
Gamma Spectrum and Tritium Analysis

SURFACE WATER	0130	SURFACE WATER	0220	SURFACE WATER	0320
MN-54	<3.5	MN-54	<3.0	MN-54	<2.8
CO-58	<1.4	CO-58	<1.7	CO-58	<3.9
FE-59	<3.8	FE-59	<5.0	FE-59	<3.9
CO-60	<4.4	CO-60	<4.6	CO-60	<4.9
ZN-65	<2.9	ZN-65	<4.2	ZN-65	<5.1
ZR-95	<3.0	ZR-95	<3.5	ZR-95	<3.0
I-131	<5.1	I-131	<6.7	I-131	<7.0
CS-134	<5.6	CS-134	<1.8	CS-134	<2.6
CS-137	<4.4	CS-137	<3.9	CS-137	<5.1
BA-140	<3.2	BA-140	<5.9	BA-140	<4.3
H-3	<160	H-3	<136	H-3	<161

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Surface Water
(pCi/Liter)
STATION NUMBER MUSH
Gamma Spectrum and Tritium Analysis

SURFACE WATER	0417	SURFACE WATER	0515
MN-54	<4.2	MN-54	<4.5
CO-58	<2.8	CO-58	<5.4
FE-59	<5.4	FE-59	<6.1
CO-60	<4.5	CO-60	<2.9
ZN-65	<3.9	ZN-65	<5.1
ZR-95	<4.3	ZR-95	<2.8
I-131	<6.4	I-131	<18.4
CS-134	<4.0	CS-134	<5.6
CS-137	<3.3	CS-137	<5.0
BA-140	<3.7	BA-140	<5.1
H-3	<156	H-3	<128

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Surface Water
(pCi/Liter)
STATION NUMBER SP
Gamma Spectrum and Tritium Analysis

SURFACE WATER	0130	SURFACE WATER	0220	SURFACE WATER	0320
MN-54	<5.0	MN-54	<5.2	MN-54	<5.5
CO-58	<3.3	CO-58	<3.9	CO-58	<2.3
FE-59	<8.5	FE-59	<5.8	FE-59	<2.9
CO-60	<5.6	CO-60	<3.7	CO-60	<3.5
ZN-65	<7.6	ZN-65	<8.9	ZN-65	<4.4
ZR-95	<4.2	ZR-95	<7.3	ZR-95	<3.6
I-131	<7.8	I-131	<8.4	I-131	<7.7
CS-134	<4.6	CS-134	<6.7	CS-134	<3.4
CS-137	<5.3	CS-137	<4.5	CS-137	<4.1
BA-140	<3.9	BA-140	<8.2	BA-140	<8.8
H-3	14300+-342	H-3	13377+-320	H-3	13679+-331

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Surface Water
(pCi/Liter)
STATION NUMBER SP
Gamma Spectrum and Tritium Analysis

SURFACE WATER	0417	SURFACE WATER	0515	SURFACE WATER	0619
MN-54	<1.7	MN-54	<2.6	MN-54	<2.4
CO-58	<2.2	CO-58	<3.8	CO-58	<1.3
FE-59	<2.2	FE-59	<2.9	FE-59	<6.1
CO-60	<2.2	CO-60	<2.1	CO-60	<2.9
ZN-65	<3.7	ZN-65	<2.9	ZN-65	<5.3
ZR-95	<1.5	ZR-95	<3.4	ZR-95	<3.2
I-131	<4.0	I-131	<8.9	I-131	<4.2
CS-134	<1.9	CS-134	<2.5	CS-134	<3.5
CS-137	<2.5	CS-137	<1.9	CS-137	<3.5
BA-140	<3.7	BA-140	<4.7	BA-140	<2.6
H-3	12954+-322	H-3	12372+-303	H-3	11394+-305

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Surface Water
(pCi/Liter)
STATION NUMBER SP
Gamma Spectrum and Tritium Analysis

SURFACE WATER	0717	SURFACE WATER	0821	SURFACE WATER	0918
MN-54	<2.3	MN-54	<1.4	MN-54	<3.0
CO-58	<2.3	CO-58	<1.2	CO-58	<2.5
FE-59	<3.7	FE-59	<4.4	FE-59	<3.5
CO-60	<3.0	CO-60	<1.6	CO-60	<1.4
ZN-65	<4.9	ZN-65	<2.5	ZN-65	<5.3
ZR-95	<3.2	ZR-95	<1.3	ZR-95	<2.8
I-131	<9.3	I-131	<4.2	I-131	<5.7
CS-134	<2.7	CS-134	<2.4	CS-134	<2.7
CS-137	<3.2	CS-137	<2.6	CS-137	<2.6
BA-140	<4.5	BA-140	<0.9	BA-140	<3.5
H-3	12960+-325	H-3	14720+-344	H-3	16308+-369

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Surface Water
(pCi/Liter)
STATION NUMBER SP
Gamma Spectrum and Tritium Analysis

SURFACE WATER	1016	SURFACE WATER	1120	SURFACE WATER	1219
MN-54	<3.7	MN-54	<4.8	MN-54	<4.9
CO-58	<4.5	CO-58	<4.7	CO-58	<4.6
FE-59	<6.8	FE-59	<7.6	FE-59	<11.5
CO-60	<4.2	CO-60	<3.8	CO-60	<5.5
ZN-65	<5.0	ZN-65	<9.2	ZN-65	<6.8
ZR-95	<3.9	ZR-95	<3.6	ZR-95	<5.7
I-131	<8.3	I-131	<8.4	I-131	<8.8
CS-134	<3.3	CS-134	<5.9	CS-134	<3.9
CS-137	<2.8	CS-137	<3.4	CS-137	<3.8
BA-140	<6.5	BA-140	<2.9	BA-140	<5.2
H-3	16192+-370	H-3	16419+-366	H-3	17277+-383

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne

Surface Water

(pCi/Liter)
STATION NUMBER SP
Gamma Spectrum and Tritium Analysis

SURFACE WATER DUP	0320
MN-54	<2.9
CO-58	<1.9
FE-59	<3.5
CO-60	<2.7
ZN-65	<2.0
ZR-95	<4.5
I-131	<4.9
CS-134	<3.8
CS-137	<2.6
BA-140	<3.3
H-3	14117+-237

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER B-12
Gamma Spectrum Analysis

GROUND WATER	0226	GROUND WATER	0515	GROUND WATER	0821
MN-54	<5.7	MN-54	<2.4	MN-54	<3.8
CO-58	<5.5	CO-58	<2.6	CO-58	<3.0
FE-59	<6.1	FE-59	<3.0	FE-59	<5.7
CO-60	<3.3	CO-60	<1.4	CO-60	<2.1
ZN-65	<8.4	ZN-65	<3.5	ZN-65	<5.7
ZR-95	<6.1	ZR-95	<3.0	ZR-95	<3.0
CS-134	<6.8	CS-134	<1.6	CS-134	<2.6
CS-137	<6.6	CS-137	<2.9	CS-137	<5.5
BA-140	<7.6	BA-140	<2.1	BA-140	<3.3

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER B-12
Gamma Spectrum Analysis

GROUND WATER	1112
MN-54	<1.8
CO-58	<2.4
FE-59	<3.7
CO-60	<3.1
ZN-65	<5.6
ZR-95	<3.9
CS-134	<3.9
CS-137	<3.5
BA-140	<3.0

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER C-10
Gamma Spectrum Analysis

GROUND WATER	0226	GROUND WATER	0515	GROUND WATER	0821
MN-54	<6.2	MN-54	<2.1	MN-54	<5.9
CO-58	<6.2	CO-58	<1.3	CO-58	<4.8
FE-59	<7.8	FE-59	<4.3	FE-59	<7.6
CO-60	<4.5	CO-60	<2.1	CO-60	<2.5
ZN-65	<9.2	ZN-65	<3.8	ZN-65	<6.6
ZR-95	<5.8	ZR-95	<1.9	ZR-95	<4.0
CS-134	<6.3	CS-134	<2.2	CS-134	<4.7
CS-137	<4.2	CS-137	<2.2	CS-137	<5.5
BA-140	<7.4	BA-140	<1.6	BA-140	<7.0

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER C-10
Gamma Spectrum Analysis

GROUND WATER	1112	GROUND WATER DUP	1112
MN-54	<2.5	MN-54	<5.1
CO-58	<2.2	CO-58	<5.2
FE-59	<5.7	FE-59	<3.9
CO-60	<3.2	CO-60	<4.4
ZN-65	<3.4	ZN-65	<12.2
ZR-95	<3.4	ZR-95	<4.2
CS-134	<1.9	CS-134	<4.9
CS-137	<2.2	CS-137	<5.6
BA-140	<1.6	BA-140	<5.8

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER C-49
Gamma Spectrum Analysis

GROUND WATER	0226	GROUND WATER	0515	GROUND WATER	0821
MN-54	<3.2	MN-54	<3.1	MN-54	<4.6
CO-58	<2.5	CO-58	<4.2	CO-58	<2.2
FE-59	<5.7	FE-59	<5.3	FE-59	<8.7
CO-60	<2.7	CO-60	<4.7	CO-60	<2.7
ZN-65	<5.4	ZN-65	<8.0	ZN-65	<6.7
ZR-95	<3.1	ZR-95	<5.1	ZR-95	<2.9
CS-134	<3.2	CS-134	<3.4	CS-134	<2.8
CS-137	<2.2	CS-137	<4.8	CS-137	<5.3
BA-140	<3.9	BA-140	<5.1	BA-140	<6.4

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne

Ground Water

(pCi/Liter)

STATION NUMBER C-49

Gamma Spectrum Analysis

GROUND WATER	1112
MN-54	<4.3
CO-58	<4.2
FE-59	<5.7
CO-60	<4.0
ZN-65	<4.9
ZR-95	<3.8
CS-134	<4.4
CS-137	<2.8
BA-140	<4.0

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER D-65
Gamma Spectrum Analysis

GROUND WATER	0307
MN-54	<5.8
CO-58	<3.1
FE-59	<6.1
CO-60	<4.0
ZN-65	<6.8
ZR-95	<6.8
CS-134	<4.6
CS-137	<3.9
BA-140	<7.6

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER J-1
Gamma Spectrum Analysis

GROUND WATER	0515	GROUND WATER	0820	GROUND WATER	1112
MN-54	<4.2	MN-54	<3.1	MN-54	<7.2
CO-58	<2.3	CO-58	<2.5	CO-58	<6.2
FE-59	<5.0	FE-59	<2.9	FE-59	<10.1
CO-60	<3.7	CO-60	<1.6	CO-60	<3.6
ZN-65	<4.0	ZN-65	<3.0	ZN-65	<3.5
ZR-95	<2.7	ZR-95	<3.2	ZR-95	<7.1
CS-134	<5.3	CS-134	<1.9	CS-134	<6.7
CS-137	<4.6	CS-137	<3.5	CS-137	<5.7
BA-140	<3.8	BA-140	<3.9	BA-140	<8.6

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER L-49
Gamma Spectrum Analysis

GROUND WATER	0226	GROUND WATER	0515	GROUND WATER	0821
MN-54	<2.6	MN-54	<3.7	MN-54	<2.4
CO-58	<4.0	CO-58	<4.4	CO-58	<3.1
FE-59	<7.5	FE-59	<3.7	FE-59	<5.3
CO-60	<4.3	CO-60	<3.8	CO-60	<2.9
ZN-65	<9.7	ZN-65	<7.6	ZN-65	<7.1
ZR-95	<3.3	ZR-95	<3.4	ZR-95	<2.8
CS-134	<1.9	CS-134	<2.9	CS-134	<2.8
CS-137	<6.1	CS-137	<5.8	CS-137	<2.0
BA-140	<4.9	BA-140	<4.4	BA-140	<2.3

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER L-49
Gamma Spectrum Analysis

GROUND WATER	1112
MN-54	<3.5
CO-58	<2.9
FE-59	<6.1
CO-60	<2.4
ZN-65	<4.1
ZR-95	<3.5
CS-134	<5.3
CS-137	<5.6
BA-140	<3.7

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER B-12
Tritium Analysis

Collection Date:	H-3
0226	<130
0515	<128
0821	<157
1112	<162

* Duplicate

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER C-10
Tritium Analysis

Collection Date:	H-3
0226	<130
0515	<128
0821	<157
1112*	<162
1112	<162

* Duplicate

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER C-49
Tritium Analysis

Collection Date:	H-3
0226	<130
0515	<128
0821	<157
1112	<162

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne

Ground Water

(pCi/Liter)
STATION NUMBER D-65
Tritium Analysis

Collection Date:	H-3
0307	<160

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER J-1
Tritium Analysis

Collection Date:	H-3
0515	<128
0820	<157
1112	<162

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER L-49
Tritium Analysis

Collection Date:	H-3
0226	<130
0515	<128
0821	<157
1112	<162

* Duplicate

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER B-12
Radiochemical Analysis

Collection Date:	I-131
0226	<0.3
0515	<0.3
0821	<0.3
1112	<0.4

*** Duplicate**

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER C-10
Radiochemical Analysis

Collection Date:	I-131
0226	<0.3
0515	<0.5
0821	<0.4
1112*	<0.4
1112	<0.4

* Duplicate

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER C-49
Radiochemical Analysis

Collection Date	I-131
0226	<0.4
0515	<0.5
0821	<0.3
1112	<0.4

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER D-65
Radiochemical Analysis

Collection Date	I-131
0307	<0.4

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne

Ground Water

(pCi/Liter)
STATION NUMBER J-1
Radiochemical Analysis

Collection Date	I-131
0515	<0.4
0820	<0.4
1112	<0.2

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Ground Water
(pCi/Liter)
STATION NUMBER L-49
Radiochemical Analysis

Collection Date:	I-131
0226	<0.3
0515	<0.4
0821	<0.4
1112	<0.3

*** Duplicate**

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER BW15
Gamma Spectrum Analysis

DRINKING WATER	0103 / 0205	DRINKING WATER	0205 / 0307	DRINKING WATER	0307 / 0402
MN-54	<3.5	MN-54	<4.7	MN-54	<5.8
CO-58	<5.0	CO-58	<4.4	CO-58	<3.9
FE-59	<6.6	FE-59	<6.2	FE-59	<3.3
CO-60	<3.7	CO-60	<6.3	CO-60	<4.2
ZN-65	<4.8	ZN-65	<6.9	ZN-65	<4.5
ZR-95	<6.8	ZR-95	<6.6	ZR-95	<6.2
CS-134	<5.4	CS-134	<5.6	CS-134	<5.0
CS-137	<5.5	CS-137	<6.2	CS-137	<4.2
BA-140	<6.1	BA-140	<3.5	BA-140	<3.3

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER BW15
Gamma Spectrum Analysis

DRINKING WATER	0402 / 0506	DRINKING WATER	0506 / 0604	DRINKING WATER	0604 / 0702
MN-54	<1.9	MN-54	<3.4	MN-54	<5.8
CO-58	<1.2	CO-58	<4.7	CO-58	<4.1
FE-59	<3.9	FE-59	<8.2	FE-59	<6.5
CO-60	<2.4	CO-60	<3.5	CO-60	<5.1
ZN-65	<2.9	ZN-65	<5.2	ZN-65	<3.1
ZR-95	<1.9	ZR-95	<2.8	ZR-95	<3.2
CS-134	<1.6	CS-134	<4.9	CS-134	<4.1
CS-137	<2.7	CS-137	<4.9	CS-137	<2.8
BA-140	<0.9	BA-140	<3.2	BA-140	<5.7

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER BW15
Gamma Spectrum Analysis

DRINKING WATER	0702 / 0806	DRINKING WATER	0806 / 0903	DRINKING WATER	0903 / 1001
MN-54	<2.3	MN-54	<2.8	MN-54	<3.4
CO-58	<2.4	CO-58	<1.5	CO-58	<2.8
FE-59	<3.7	FE-59	<4.1	FE-59	<8.3
CO-60	<2.6	CO-60	<2.1	CO-60	<2.3
ZN-65	<2.8	ZN-65	<3.0	ZN-65	<7.3
ZR-95	<1.9	ZR-95	<2.4	ZR-95	<3.4
CS-134	<2.6	CS-134	<3.7	CS-134	<4.5
CS-137	<2.9	CS-137	<1.8	CS-137	<5.0
BA-140	<1.6	BA-140	<2.1	BA-140	<3.8

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER BW15
Gamma Spectrum Analysis

DRINKING WATER	1001 / 1105	DRINKING WATER	1105 / 1203	DRINKING WATER	1203 / 0107
MN-54	<3.3	MN-54	<3.3	MN-54	<5.2
CO-58	<2.3	CO-58	<2.9	CO-58	<2.9
FE-59	<6.0	FE-59	<4.7	FE-59	<8.6
CO-60	<2.9	CO-60	<1.3	CO-60	<3.1
ZN-65	<2.4	ZN-65	<3.8	ZN-65	<7.6
ZR-95	<3.8	ZR-95	<2.8	ZR-95	<4.0
CS-134	<3.8	CS-134	<3.6	CS-134	<8.1
CS-137	<2.9	CS-137	<2.5	CS-137	<7.5
BA-140	<1.6	BA-140	<1.8	BA-140	<6.3

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER LW40
Gamma Spectrum Analysis

DRINKING WATER	0102 / 0205	DRINKING WATER	0205 / 0307	DRINKING WATER	0307 / 0402
MN-54	<3.2	MN-54	<1.7	MN-54	<2.4
CO-58	<3.9	CO-58	<3.4	CO-58	<3.6
FE-59	<5.3	FE-59	<8.0	FE-59	<5.7
CO-60	<4.9	CO-60	<4.0	CO-60	<4.6
ZN-65	<8.0	ZN-65	<5.3	ZN-65	<8.3
ZR-95	<5.2	ZR-95	<4.3	ZR-95	<3.3
CS-134	<3.9	CS-134	<5.2	CS-134	<1.8
CS-137	<4.2	CS-137	<5.9	CS-137	<4.9
BA-140	<3.6	BA-140	<4.9	BA-140	<5.5

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER LW40
Gamma Spectrum Analysis

DRINKING WATER	0402 / 0506	DRINKING WATER	0506 / 0604	DRINKING WATER	0604 / 0702
MN-54	<2.4	MN-54	<4.4	MN-54	<2.5
CO-58	<2.0	CO-58	<2.5	CO-58	<3.5
FE-59	<4.4	FE-59	<7.3	FE-59	<2.8
CO-60	<2.2	CO-60	<4.7	CO-60	<1.9
ZN-65	<2.4	ZN-65	<8.1	ZN-65	<3.0
ZR-95	<2.1	ZR-95	<4.1	ZR-95	<2.6
CS-134	<2.1	CS-134	<7.3	CS-134	<2.1
CS-137	<2.1	CS-137	<3.1	CS-137	<2.0
BA-140	<2.9	BA-140	<4.1	BA-140	<2.9

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER LW40
Gamma Spectrum Analysis

DRINKING WATER	0702 / 0806	DRINKING WATER	0806 / 0903	DRINKING WATER	0903 / 1001
MN-54	<2.6	MN-54	<3.3	MN-54	<3.6
CO-58	<1.5	CO-58	<4.5	CO-58	<3.7
FE-59	<4.1	FE-59	<4.8	FE-59	<10.2
CO-60	<2.5	CO-60	<4.4	CO-60	<5.3
ZN-65	<6.0	ZN-65	<5.1	ZN-65	<7.0
ZR-95	<3.2	ZR-95	<5.2	ZR-95	<3.1
CS-134	<2.4	CS-134	<5.5	CS-134	<6.5
CS-137	<1.9	CS-137	<5.3	CS-137	<2.4
BA-140	<4.7	BA-140	<4.0	BA-140	<6.7

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER LW40
Gamma Spectrum Analysis

DRINKING WATER	1001	/ 1105	DRINKING WATER	1105	/ 1203	DRINKING WATER	1203	/ 0107
MN-54	<1.9		MN-54	<4.7		MN-54	<5.7	
CO-58	<1.4		CO-58	<3.0		CO-58	<4.9	
FE-59	<5.7		FE-59	<5.3		FE-59	<9.8	
CO-60	<2.9		CO-60	<4.6		CO-60	<6.2	
ZN-65	<3.4		ZN-65	<6.1		ZN-65	<3.5	
ZR-95	<2.4		ZR-95	<2.7		ZR-95	<3.1	
CS-134	<3.3		CS-134	<6.9		CS-134	<5.6	
CS-137	<2.9		CS-137	<3.6		CS-137	<3.7	
BA-140	<2.5		BA-140	<6.0		BA-140	<6.7	

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER NFDW
Gamma Spectrum Analysis

DRINKING WATER	0102 / 0205	DRINKING WATER	0205 / 0307	DRINKING WATER	0307 / 0402
MN-54	<2.6	MN-54	<2.6	MN-54	<2.7
CO-58	<2.4	CO-58	<3.2	CO-58	<2.5
FE-59	<4.7	FE-59	<6.8	FE-59	<4.3
CO-60	<2.3	CO-60	<3.7	CO-60	<2.8
ZN-65	<2.3	ZN-65	<3.0	ZN-65	<3.7
ZR-95	<2.7	ZR-95	<1.8	ZR-95	<2.0
CS-134	<3.1	CS-134	<4.4	CS-134	<2.7
CS-137	<2.4	CS-137	<2.3	CS-137	<3.9
BA-140	<3.0	BA-140	<3.5	BA-140	<4.7

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER NFDW
Gamma Spectrum Analysis

DRINKING WATER	0402 / 0506	DRINKING WATER	0506 / 0604	DRINKING WATER	0604 / 0702
MN-54	<2.5	MN-54	<2.7	MN-54	<3.6
CO-58	<2.8	CO-58	<2.0	CO-58	<3.0
FE-59	<4.6	FE-59	<5.2	FE-59	<9.5
CO-60	<5.8	CO-60	<3.3	CO-60	<4.2
ZN-65	<6.3	ZN-65	<3.6	ZN-65	<3.7
ZR-95	<1.9	ZR-95	<3.6	ZR-95	<2.9
CS-134	<5.0	CS-134	<3.4	CS-134	<3.6
CS-137	<4.7	CS-137	<6.0	CS-137	<6.4
BA-140	<4.7	BA-140	<3.6	BA-140	<5.8

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER NFDW
Gamma Spectrum Analysis

DRINKING WATER	0702 / 0806	DRINKING WATER	0806 / 0903	DRINKING WATER	0903 / 1001
MN-54	<2.8	MN-54	<2.7	MN-54	<2.2
CO-58	<2.8	CO-58	<2.4	CO-58	<2.9
FE-59	<5.0	FE-59	<6.5	FE-59	<4.3
CO-60	<4.8	CO-60	<3.1	CO-60	<2.0
ZN-65	<7.2	ZN-65	<3.4	ZN-65	<6.7
ZR-95	<4.8	ZR-95	<2.3	ZR-95	<3.7
CS-134	<4.9	CS-134	<2.6	CS-134	<2.8
CS-137	<4.4	CS-137	<1.9	CS-137	<3.8
BA-140	<4.1	BA-140	<2.5	BA-140	<3.0

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER NFDW
Gamma Spectrum Analysis

DRINKING WATER	1001 / 1105
MN-54	<3.1
CO-58	<5.6
FE-59	<7.4
CO-60	<6.1
ZN-65	<6.0
ZR-95	<6.2
CS-134	<4.6
CS-137	<6.1
BA-140	<3.3

DRINKING WATER	1105 / 1203
MN-54	<3.3
CO-58	<3.3
FE-59	<6.4
CO-60	<3.2
ZN-65	<4.1
ZR-95	<3.5
CS-134	<4.8
CS-137	<4.8
BA-140	<3.4

DRINKING WATER	1203 / 0107
MN-54	<1.9
CO-58	<2.1
FE-59	<3.9
CO-60	<4.5
ZN-65	<5.0
ZR-95	<3.3
CS-134	<2.6
CS-137	<4.8
BA-140	<3.9

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER BW15
Radiochemical Analysis

Start Date:	Stop Date:	GR-B
0103	0205	5.5+-1.1
0205	0307	5.5+-1.2
0307	0402	4.0+-1.2
0402	0506	5.0+-1.2
0506	0604	5.7+-1.2
0604	0702	4.8+-1.3
0702	0806	5.0+-1.3
0806	0903	4.4+-1.0
0903	1001	4.9+-1.2
1001	1105	5.2+-1.1
1105	1203	3.5+-1.0
1203	0107	4.1+-1.1

*** Duplicate**

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER LW40
Radiochemical Analysis

Start Date:	Stop Date:	GR-B
0102	0205	5.6+-1.1
0205	0307	4.6+-1.2
0307	0402	5.0+-1.3
0402	0506	3.8+-1.2
0506	0604	3.7+-1.1
0604	0702	3.3+-1.1
0702	0806	4.4+-1.2
0806	0903	5.3+-1.1
0903	1001	4.2+-1.2
1001	1105	4.0+-1.0
1105	1203	3.9+-1.0
1203	0107	3.7+-1.2

* Duplicate

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER
NFDW
Radiochemical Analysis

Start Date:	Stop Date:	GR-B
0102	0205	5.3+-1.1
0205	0307	6.8+-1.4
0307	0402	7.8+-1.3
0402	0506	4.1+-1.1
0506	0604	4.0+-1.1
0604	0702	5.5+-1.2
0702	0806	4.3+-1.1
0806	0903	5.4+-1.1
0903	1001	4.4+-1.2
1001	1105	4.5+-1.0
1105	1203	3.1+-0.9
1203	0107	3.8+-1.1

* Duplicate

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne

Drinking Water

(pCi/Liter)
STATION NUMBER BW15
Tritium Analysis

Start Date:	Stop Date:	H-3
0103	0402	<157
0402	0702	<158
0702	1001	<159
1001	0107	<165

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER LW40
Tritium Analysis

Start Date:	Stop Date:	H-3
0102	0402	<157
0402	0702	<158
0702*	1001	<159
0702	1001	<159
1001	0107	<165

*** Duplicate**

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne

Drinking Water

(pCi/Liter)
STATION NUMBER
NFDW
Tritium Analysis

Start Date:	Stop Date:	H-3
0102	0402	<157
0402	0702	<158
0702	1001	<159
1001	0107	<165

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER BW15
Radiochemical Analysis

Start Date:	Stop Date:	I-131
0103	0205	<0.4
0205	0307	<0.4
0307	0402	<0.3
0402	0506	<0.3
0506	0604	<0.3
0604	0702	<0.3
0702	0806	<0.3
0806	0903	<0.2
0903	1001	<0.4
1001	1105	<0.5
1105	1203	<0.3
1203	0107	<0.3

* Duplicate

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER LW40
Radiochemical Analysis

Start Date:	Stop Date:	I-131
0102	0205	<0.4
0205	0307	<0.4
0307	0402	<0.3
0402	0506	<0.3
0506	0604	<0.4
0604	0702	<0.4
0702	0806	<0.3
0806	0903	<0.3
0903	1001	<0.4
1001	1105	<0.3
1105	1203	<0.3
1203	0107	<0.3

*** Duplicate**

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Drinking Water
(pCi/Liter)
STATION NUMBER
NFDW
Radiochemical Analysis

Start Date:	Stop Date:	I-131
0102	0205	<0.4
0205	0307	<0.3
0307	0402	<0.2
0402	0506	<0.3
0506	0604	<0.4
0604	0702	<0.4
0702	0806	<0.4
0806	0903	<0.2
0903	1001	<0.4
1001	1105	<0.3
1105	1203	<0.3
1203	0107	<0.4

*** Duplicate**

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Shoreline Sediment
(pCi/KG DRY)
STATION NUMBER DC
Gamma Spectrum Analysis

0612	SHORELINE SEDIMENT
K-40	10890.0+-811.0
MN-54	<27.5
CO-58	<35.7
FE-59	<51.1
CO-60	<18.1
ZN-65	<72.3
CS-134	<51.9
CS-137	<34.3
1119	SHORELINE SEDIMENT
K-40	11677.0+-921.2
MN-54	<40.5
CO-58	<38.0
FE-59	<80.5
CO-60	<44.1
ZN-65	<114.7
CS-134	<56.0
CS-137	<43.5

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Shoreline Sediment
(pCi/KG DRY)
STATION NUMBER EEA
Gamma Spectrum Analysis

0624	SHORELINE SEDIMENT
K-40	11321.0+-1077.0
MN-54	<43.5
CO-58	<37.0
FE-59	<79.3
CO-60	<23.1
ZN-65	<117.1
CS-134	<59.0
CS-137	144.1+-58.1

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne
Shoreline Sediment
(pCi/KG DRY)
STATION NUMBER JRR
Gamma Spectrum Analysis

0630	SHORELINE SEDIMENT
K-40	11960.0+-987.7
MN-54	<35.7
CO-58	<59.0
FE-59	<80.5
CO-60	<37.4
ZN-65	<82.5
CS-134	<57.9
CS-137	<36.7
1111	SHORELINE SEDIMENT
K-40	4565.7+-463.3
MN-54	<23.6
CO-58	<24.5
FE-59	<44.6
CO-60	<22.2
ZN-65	<62.4
CS-134	<35.0
CS-137	<28.0

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Waterborne

Shoreline Sediment

(pCi/KG DRY)
STATION NUMBER MUDS
Gamma Spectrum Analysis

SHORELINE SEDIMENT	0612
K-40	10623.0+-886.4
MN-54	<29.6
CO-58	<28.3
FE-59	<84.3
CO-60	<24.3
ZN-65	<59.8
CS-134	<48.0
CS-137	<29.8

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Fish
(pCi/KG WET)
STATION NUMBER JRR
Gamma Spectrum and Tritium Analysis

CHANNEL CATFISH	0612	CHANNEL CATFISH	1111
K-40	2734.5+-354.1	K-40	3220.5+-347.8
MN-54	<10.3	MN-54	<7.9
CO-58	<8.8	CO-58	<9.9
FE-59	<16.6	FE-59	<30.8
CO-60	<10.0	CO-60	<9.4
ZN-65	<18.4	ZN-65	<16.4
CS-134	<14.3	CS-134	<16.2
CS-137	<16.3	CS-137	<13.2
H-3	<112	H-3	<88

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Fish
(pCi/KG WET)
STATION NUMBER JRR
Gamma Spectrum and Tritium Analysis

COMMON CARP	0612	COMMON CARP	1111	LM BASS	0612
K-40	3118.8+-430.3	K-40	3266.1+-424.3	K-40	3045.0+-272.6
MN-54	<12.0	MN-54	<13.6	MN-54	<6.0
CO-58	<17.4	CO-58	<20.4	CO-58	<7.8
FE-59	<29.0	FE-59	<24.6	FE-59	<9.4
CO-60	<7.9	CO-60	<14.4	CO-60	<5.2
ZN-65	<18.3	ZN-65	<28.9	ZN-65	<18.1
CS-134	<12.9	CS-134	<10.4	CS-134	<9.1
CS-137	<18.7	CS-137	<10.7	CS-137	<8.6
H-3	<118	H-3	<128	H-3	<95

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Fish
(pCi/KG WET)
STATION NUMBER JRR
Gamma Spectrum and Tritium Analysis

WHITE CRAPPIE	1111
K-40	3816.3+-474.2
MN-54	<14.1
CO-58	<11.0
FE-59	<39.0
CO-60	<13.7
ZN-65	<28.0
CS-134	<19.6
CS-137	<8.8
H-3	<129

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Fish
(pCi/KG WET)
STATION NUMBER WCL
Gamma Spectrum and Tritium Analysis

CHANNEL CATFISH	0729	CHANNEL CATFISH	1021	COMMON CARP	0729
K-40	3488.7+-405.0	K-40	2633.4+-588.1	K-40	2911.5+-345.7
MN-54	<13.5	MN-54	<22.6	MN-54	<11.4
CO-58	<16.3	CO-58	<14.6	CO-58	<16.6
FE-59	<28.8	FE-59	<32.6	FE-59	<37.0
CO-60	<13.6	CO-60	<21.6	CO-60	<7.8
ZN-65	<24.3	ZN-65	<28.2	ZN-65	<28.0
CS-134	<15.1	CS-134	<24.8	CS-134	<7.8
CS-137	<11.9	CS-137	<20.0	CS-137	<8.2
H-3	9267+-239	H-3	7995.0+-188.0	H-3	6463+-171

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Fish
(pCi/KG WET)
STATION NUMBER WCL
Gamma Spectrum and Tritium Analysis

FLATHEAD CATFISH	0729	SM BASS	0729	SM BUFFALO	1021
K-40	3013.0+-305.9	K-40	3101.6+-362.1	K-40	2504.8+-395.1
MN-54	<12.7	MN-54	<7.1	MN-54	<10.5
CO-58	<14.8	CO-58	<9.4	CO-58	<8.8
FE-59	<29.1	FE-59	<40.8	FE-59	<9.8
CO-60	<9.7	CO-60	<13.9	CO-60	<13.0
ZN-65	<20.4	ZN-65	<20.7	ZN-65	<14.2
CS-134	<7.8	CS-134	<12.5	CS-134	<15.9
CS-137	<11.8	CS-137	<14.6	CS-137	<10.8
H-3	6799+-176	H-3	5852+-161	H-3	10069.0+-224.0

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Fish
(pCi/KG WET)
STATION NUMBER WCL
Gamma Spectrum and Tritium Analysis

WALLEYE	1021	WHITE BASS	1021	WHITE CRAPPIE	1021
K-40	3725.8+-344.7	K-40	3001.9+-534.2	K-40	3637.1+-532.7
MN-54	<5.8	MN-54	<17.7	MN-54	<22.8
CO-58	<9.2	CO-58	<12.4	CO-58	<15.0
FE-59	<12.6	FE-59	<25.6	FE-59	<25.4
CO-60	<9.2	CO-60	<11.2	CO-60	<7.6
ZN-65	<16.2	ZN-65	<33.3	ZN-65	<25.6
CS-134	<6.6	CS-134	<23.4	CS-134	<20.6
CS-137	<8.5	CS-137	<19.1	CS-137	<16.3
H-3	8798.0+-198.0	H-3	11620.0+-234.0	H-3	8911.0+-205.0

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Fish
(pCi/KG WET)
STATION NUMBER WCL
Gamma Spectrum and Tritium Analysis

WIPER	1021
K-40	3080.5+-377.0
MN-54	<12.8
CO-58	<14.7
FE-59	<19.4
CO-60	<12.0
ZN-65	<26.4
CS-134	<16.0
CS-137	<12.3
H-3	10928.0+-243.0

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Food/Garden Crops
(pCi/KG WET)
STATION NUMBER D-1
Gamma Spectrum Analysis

0515	RHUBARB	0709	RHUBARB	0910	RHUBARB
BE-7	<153.8	BE-7	<127.2	BE-7	<138.9
K-40	3248.6+-465.6	K-40	2880.5+-326.3	K-40	2110.9+-309.7
MN-54	<14.4	MN-54	<9.8	MN-54	<10.6
CO-58	<15.4	CO-58	<10.8	CO-58	<13.5
FE-59	<35.9	FE-59	<23.5	FE-59	<15.4
CO-60	<16.1	CO-60	<7.8	CO-60	<10.3
ZN-65	<29.6	ZN-65	<16.5	ZN-65	<17.0
ZR-95	<17.5	ZR-95	<10.3	ZR-95	<9.4
I-131	<25.3	I-131	<17.7	I-131	<17.6
CS-134	<17.9	CS-134	<9.7	CS-134	<7.9
CS-137	<9.3	CS-137	<11.7	CS-137	<12.3
0611	RHUBARB	0820	RHUBARB	1016	RHUBARB
BE-7	<144.7	BE-7	286.3+-130.1	BE-7	306.8+-130.9
K-40	2584.8+-395.7	K-40	2565.2+-275.2	K-40	4769.8+-482.0
MN-54	<15.9	MN-54	<9.5	MN-54	<14.1
CO-58	<14.3	CO-58	<7.7	CO-58	<13.1
FE-59	<21.2	FE-59	<16.8	FE-59	<17.1
CO-60	<24.9	CO-60	<11.3	CO-60	<17.1
ZN-65	<33.6	ZN-65	<15.7	ZN-65	<22.1
ZR-95	<16.1	ZR-95	<7.6	ZR-95	<7.4
I-131	<19.6	I-131	<12.9	I-131	<21.3
CS-134	<15.2	CS-134	<10.3	CS-134	<15.7
CS-137	<14.5	CS-137	<9.9	CS-137	<14.4

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Food/Garden Crops
(pCi/KG WET)
STATION NUMBER D-1
Gamma Spectrum Analysis

1112	RHUBARB
BE-7	<277.5
K-40	4782.7+-714.5
MN-54	<20.6
CO-58	<22.9
FE-59	<49.1
CO-60	<13.5
ZN-65	<48.8
ZR-95	<17.7
I-131	<39.7
CS-134	<13.2
CS-137	<18.6

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Food/Garden Crops
(pCi/KG WET)
STATION NUMBER G-1
Gamma Spectrum Analysis

0611	CABBAGE	0820	TURNIP GREENS
BE-7	<146.0	BE-7	<194.9
K-40	2618.8+-350.0	K-40	4652.5+-588.5
MN-54	<10.9	MN-54	<21.4
CO-58	<11.2	CO-58	<10.9
FE-59	<22.4	FE-59	<26.6
CO-60	<8.5	CO-60	<17.2
ZN-65	<22.7	ZN-65	<26.6
ZR-95	<10.7	ZR-95	<19.4
I-131	<15.8	I-131	<35.7
CS-134	<11.2	CS-134	<27.5
CS-137	<12.1	CS-137	<17.5
0709	CABBAGE	0910	TURNIP GREENS
BE-7	<144.2	BE-7	<179.0
K-40	2292.9+-311.8	K-40	4899.8+-504.1
MN-54	<12.0	MN-54	<17.0
CO-58	<6.1	CO-58	<7.4
FE-59	<15.7	FE-59	<19.4
CO-60	<8.8	CO-60	<16.7
ZN-65	<24.6	ZN-65	<27.2
ZR-95	<8.7	ZR-95	<13.0
I-131	<13.1	I-131	<31.4
CS-134	<16.5	CS-134	<14.3
CS-137	<11.1	CS-137	<16.7

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Food/Garden Crops
(pCi/KG WET)
STATION NUMBER G-1 (Duplications)
Gamma Spectrum Analysis

0611	CABBAGE DUP
BE-7	<169.4
K-40	3173.6+-576.5
MN-54	<12.4
CO-58	<15.9
FE-59	<51.3
CO-60	<8.2
ZN-65	<34.6
ZR-95	<17.5
I-131	<37.5
CS-134	<15.4
CS-137	<13.6
0820	**TURNIP GREENS DUP**
BE-7	<241.6
K-40	4462.4+-610.6
MN-54	<17.2
CO-58	<12.8
FE-59	<30.9
CO-60	<21.4
ZN-65	<60.2
ZR-95	<13.2
I-131	<24.8
CS-134	<16.0
CS-137	<24.5

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Food/Garden Crops
(pCi/KG WET)
STATION NUMBER H-1
Gamma Spectrum Analysis

0611	LETTUCE
BE-7	<162.9
K-40	3465.6+-373.4
MN-54	<10.4
CO-58	<7.9
FE-59	<17.2
CO-60	<7.8
ZN-65	<21.0
ZR-95	<9.6
I-131	<23.4
CS-134	<11.2
CS-137	<14.0

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Food/Garden Crops
(pCi/KG WET)
STATION NUMBER N-1
Gamma Spectrum Analysis

0611	LETTUCE
BE-7	<149.0
K-40	3369.5+-369.9
MN-54	<10.9
CO-58	<8.9
FE-59	<25.8
CO-60	<11.3
ZN-65	<25.3
ZR-95	<8.6
I-131	<24.1
CS-134	<12.8
CS-137	<12.3
0820	SQUASH LEAVES
BE-7	<262.6
K-40	4026.7+-609.2
MN-54	<21.6
CO-58	<18.7
FE-59	<22.1
CO-60	<9.5
ZN-65	<52.3
ZR-95	<26.4
I-131	<22.4
CS-134	<19.3
CS-137	<23.4

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Food/Garden Crops
(pCi/KG WET)
STATION NUMBER S-4
Gamma Spectrum Analysis

0515	RHUBARB	0709	RHUBARB	0910	RHUBARB
BE-7	<204.1	BE-7	<166.9	BE-7	214.1+-116.3
K-40	3642.2+-613.3	K-40	2364.7+-494.3	K-40	2831.6+-406.0
MN-54	<7.4	MN-54	<13.3	MN-54	<12.5
CO-58	<18.0	CO-58	<12.7	CO-58	<13.6
FE-59	<13.8	FE-59	<26.1	FE-59	<20.7
CO-60	<21.6	CO-60	<14.4	CO-60	<10.5
ZN-65	<36.5	ZN-65	<23.0	ZN-65	<27.1
ZR-95	<16.5	ZR-95	<8.8	ZR-95	<14.7
I-131	<28.9	I-131	<30.1	I-131	<29.7
CS-134	<12.3	CS-134	<14.9	CS-134	<16.2
CS-137	<16.6	CS-137	<14.4	CS-137	<15.7
0611	RHUBARB	0820	RHUBARB	1016	RHUBARB
BE-7	<180.2	BE-7	282.9+-161.2	BE-7	<272.4
K-40	4155.8+-523.3	K-40	2495.6+-342.3	K-40	5447.2+-774.5
MN-54	<8.2	MN-54	<9.9	MN-54	<23.3
CO-58	<9.6	CO-58	<7.5	CO-58	<16.4
FE-59	<20.5	FE-59	<14.0	FE-59	<46.1
CO-60	<6.8	CO-60	<10.7	CO-60	<18.3
ZN-65	<52.4	ZN-65	<15.1	ZN-65	<45.2
ZR-95	<10.9	ZR-95	<9.2	ZR-95	<18.8
I-131	<24.5	I-131	<19.2	I-131	<38.9
CS-134	<11.1	CS-134	<12.1	CS-134	<36.4
CS-137	<12.2	CS-137	<12.4	CS-137	<29.6

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Food/Garden Crops
(pCi/KG WET)
STATION NUMBER S-4
Gamma Spectrum Analysis

1112	RHUBARB
BE-7	379.5+-227.6
K-40	6343.1+-533.4
MN-54	<20.1
CO-58	<11.3
FE-59	<33.7
CO-60	<12.1
ZN-65	<26.8
ZR-95	<10.8
I-131	<38.1
CS-134	<18.5
CS-137	<9.6

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Food/Garden Crops
(pCi/KG WET)
STATION NUMBER S-4 (Duplications)
Gamma Spectrum Analysis

0910	RHUBARB DUP
BE-7	<201.7
K-40	3156.1+-408.8
MN-54	<15.6
CO-58	<8.1
FE-59	<12.9
CO-60	<13.2
ZN-65	<20.7
ZR-95	<13.0
I-131	<16.5
CS-134	<14.6
CS-137	<13.4

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Feed and Forage
(pCi/KG WET)
STATION NUMBER NR-D1
Gamma Spectrum Analysis

CORN (IRRIGATED)	0829
BE-7	<50.6
K-40	2495.9+-247.0
MN-54	<4.3
CO-58	<6.7
FE-59	<6.2
CO-60	<6.3
ZN-65	<6.0
ZR-95	<6.2
I-131	<18.4
CS-134	<4.0
CS-137	<5.3

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Feed and Forage
(pCi/KG WET)
STATION NUMBER NR-D2
Gamma Spectrum Analysis

CORN (IRRIGATED)	0829
BE-7	<65.4
K-40	2457.1+-238.4
MN-54	<3.9
CO-58	<5.0
FE-59	<11.4
CO-60	<4.6
ZN-65	<8.5
ZR-95	<5.5
I-131	<16.6
CS-134	<4.7
CS-137	<5.6

SOYBEAN (IRRIGATED)	1022
BE-7	<90.0
K-40	14559.0+-454.7
MN-54	<10.2
CO-58	<8.1
FE-59	<23.4
CO-60	<12.4
ZN-65	<33.5
ZR-95	<7.4
I-131	<10.3
CS-134	<10.3
CS-137	<10.8

SOYBEAN (IRRIGATED) DUP	1022
BE-7	<149.4
K-40	14696.0+-951.9
MN-54	<13.4
CO-58	<20.1
FE-59	<44.3
CO-60	<17.5
ZN-65	<29.3
ZR-95	<14.1
I-131	<26.2
CS-134	<14.3
CS-137	<22.8

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Feed and Forage
(pCi/KG WET)
STATION NUMBER NR-U1
Gamma Spectrum Analysis

CORN	0829
BE-7	<61.2
K-40	3540.7+-365.6
MN-54	<11.8
CO-58	<7.6
FE-59	<16.3
CO-60	<9.6
ZN-65	<25.4
ZR-95	<10.3
I-131	<23.1
CS-134	<5.6
CS-137	<11.3

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Aquatic
Sediment/Silt
(pCi/KG DRY)
STATION NUMBER DC
Gamma Spectrum Analysis

0612	BOTTOM SEDIMENT
K-40	11506.0+-990.5
MN-54	<40.9
CO-58	<38.2
FE-59	<70.3
CO-60	327.2+-47.1
ZN-65	<67.6
CS-134	<56.8
CS-137	237.1+-44.6
1119	**BOTTOM SEDIMENT**
K-40	14629.0+-756.0
MN-54	<31.2
CO-58	<32.7
FE-59	<83.9
CO-60	358.8+-35.5
ZN-65	<64.5
CS-134	<46.2
CS-137	310.2+-40.7

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Aquatic
Sediment/Silt
(pCi/KG DRY)
STATION NUMBER EEA
Gamma Spectrum Analysis

0624	BOTTOM SEDIMENT
K-40	12608.0+-1080.0
MN-54	<38.2
CO-58	<37.5
FE-59	<63.5
CO-60	<42.6
ZN-65	<114.9
CS-134	<54.6
CS-137	69.1+-33.8

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Aquatic
Sediment/Silt
(pCi/KG DRY)
STATION NUMBER JRR
Gamma Spectrum Analysis

0718	BOTTOM SEDIMENT
K-40	17294.0+-1039.0
MN-54	<42.7
CO-58	<25.6
FE-59	<102.9
CO-60	<35.5
ZN-65	<63.8
CS-134	<53.5
CS-137	143.0+-52.6
1111	**BOTTOM SEDIMENT**
K-40	14603.0+-977.0
MN-54	<23.8
CO-58	<23.8
FE-59	<24.1
CO-60	<28.2
ZN-65	<56.7
CS-134	<38.2
CS-137	123.6+-52.3

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Aquatic
Sediment/Silt
(pCi/KG DRY)
STATION NUMBER MUDS
Gamma Spectrum Analysis

0612	BOTTOM SEDIMENT
K-40	8981.5+-796.7
MN-54	<36.7
CO-58	<26.9
FE-59	<33.1
CO-60	<35.2
ZN-65	<74.7
CS-134	<48.7
CS-137	<41.4

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Aquatic
Vegetation - Aquatic
(pCi/KG WET)
STATION NUMBER EEA
Gamma Spectrum Analysis

0623	CATTAILS
BE-7	<222.2
K-40	2440.8+-584.6
MN-54	<25.2
CO-58	<12.4
FE-59	<55.9
CO-60	<17.0
ZN-65	<22.8
ZR-95	<22.7
I-131	<37.3
CS-134	<25.4
CS-137	<23.0

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Terrestrial
Vegetation - Terrestrial
(pCi/KG WET)
STATION NUMBER EEA
Gamma Spectrum Analysis

0624	PASTURAGE
BE-7	865.1+-364.2
K-40	8657.3+-698.0
MN-54	<17.7
CO-58	<17.7
FE-59	<51.6
CO-60	<15.4
ZN-65	<31.4
ZR-95	<25.5
I-131	<49.7
CS-134	<23.9
CS-137	<21.5

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Terrestrial

Soil

(pCi/KG DRY)
STATION NUMBER EEA
Gamma Spectrum Analysis

0623	SOIL
K-40	10080.0+-851.6
MN-54	<31.1
CO-58	<32.5
FE-59	<32.1
CO-60	<28.0
ZN-65	<79.9
CS-134	<54.2
CS-137	187.9+-48.2

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Terrestrial

Soil

(pCi/KG DRY)
STATION NUMBER MUDS
Gamma Spectrum Analysis

0624	SOIL
K-40	11562.0+-855.3
MN-54	<31.1
CO-58	<39.1
FE-59	<50.5
CO-60	<12.1
ZN-65	<65.9
CS-134	<51.9
CS-137	153.7+-43.6

Wolf Creek Nuclear Operating Corporation
Exposure Pathway - Ingestion
Deer
(pCi/KG WET)
STATION NUMBER A2.1
Gamma Spectrum

DEER	1113
K-40	2708.1+-320.2
MN-54	<10.6
CO-58	<12.6
FE-59	<15.7
CO-60	<9.3
ZN-65	<27.9
CS-134	<7.8
CS-137	<12.6

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