WOLF CREEK
NUCLEAR OPERATING CORPORATION

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Vice President
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U. S. Nuclear Regulatory Commission
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Subject: Docket No. 50-482: Annual Radiological Environmental Operating Report

Gentlemen:

Attached is the Annual Radiological Environmental Operating Report which is being submitted pursuant to Wolf Creek Generating Station (WCGS) Technical Specification 6.9.1.6. This report covers the operation of Wolf Creek Generating Station (WCGS) for the period of January 1, 1990, through December 31, 1990.

Very truly yours,

Forrest T. Rhodes
Vice President
Engineering & Technical Services

FTR/aem

Attachment

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# WOLF CREEK NUCLEAR OPERATING CORPORATION

# WOLF CREEK GENERATING STATION

# 1990 ANNUAL RADIOLOGICAL

# ENVIRONMENTAL OPERATING REPORT

APRIL 18, 1991

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## INTRODUCTION

This is the 1990 Annual Radiological Environmental Operating Report for Wolf Creek Generating Station (WCGS) covering the period from January 1 to December 31, 1990. WCGS is located in Coffey County, Kansas, approximately five miles northeast of Burlington, Kansas.

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

This report contains a description of the Radiological Environmental Monitoring Program conducted by Wolf Creek Nuclear Operating Corporation (WCNOC), results of sample analyses performed by Teledyne Isotopes, a discussion of monitoring program results, a discussion of program deviations and revisions, and a discussion of the results of the Environmental Protection Agency (EPA) Interlaboratory Comparison Program. Individual sample results and a summary of results in the Nuclear Regulatory Commission (NRC) Branch Technical Position specified format are included as appendices to the report.

No effects of plant operation were seen in air filters (particulate and charcoal), direct radiation, broadleaf vegetation, irrigated crops, and ground water.

Tritium from routine plant releases was detected in Wolf Creek Cooling Lake (WCCL) surface water samples throughout the year. Tritium was also detected in the third quarter drinking water composite samples at both the control (Burlington) and indicator (LeRoy) locations. The activity measured at LeRoy was at the detection limit with a large measurement error. The activity measured at Burlington was two times the detection capability with a relatively small error. It is believed the tritium detected at both locations are from the same source but not attributable to Wolf Creek since the activity detected upstream of WCCL discharge was greater than the activity detected downstream. There was one elevated gross beta measurement for drinking water in February. The cause for the elevated gross beta measurement has not been identified and no other radionuclide analysis for this sample had any elevated levels. All nuclide concentrations were below applicable reporting levels.

Activation products (Co-58 and Co-60) were detected in WCCL bottom sediment and shoreline soil and in algae samples obtained in the WCCL discharge cove Mn-54, Co-58, and Co-60 were detected. Also, one fish sample from WCCL contained Cs-137 which is assumed to be due to WCGS operation, although fallout Cs-137 (which is regularly detected in other sampling media) is probably also partially reflected in the measured concentrations. All of the concentrations were below applicable reporting levels.

No measurable impact on human exposure due to plant operation was seen for the year.

## I. PROGRAM DESCRIPTION

Radiological environmental samples were collected according to the schedule in the Offsite Dose Calculation Manual. Some additional sample collections were made to support a cooperative sampling program with the State of Kansas and plant activities. All samples were collected by WCNOC's Radiological Services, Emergency Planning, and Environmental Management Groups and sent to Teledyne Isotopes of Westwood, New Jersey for analysis. Table 1 lists sampling pathways and frequencies of sampling and analysis. Table 2 lists the sample location direction and distances.

The following is a description of the sampling and analysis program by individual pathways. Deviations are permitted from the required sampling schedule if specimens are not obtainable due to hazardous conditions, seasonal unavailability, malfunction of automatic sampling equipment, and other legitimate reasons. Deviations from the routine sampling schedule and other problems encountered during the year are described in Section IV Monitoring Program Deviations.

### Airborne:

Low volume air sampling pumps continuously collected particulate samples on 47 mm glass fiber filters; samples were then drawn through charcoal canisters to collect I-131. Filters and charcoal canisters were changed out weekly, labeled, and shipped to Teledyne Isotopes for analysis. Total sample volume used to calculate air concentrations was determined from the average of the initial and final sampling flow rate and the total time of collection.

Gross beta analysis of the air particulate samples was performed after a period of at least 24 hours following filter collection to allow decay of radon and thoron daughter products. Each filter was mounted on a stainless steel planchet and counted on an automatic alpha-beta counter. If the gross beta activity for a sample would have been greater than 10 times the yearly mean of control samples, a gamma isotopic analysis would have been performed on the individual sample.

Weekly air particulate filters were combined into quarterly composites for each location and analyzed for gamma emitting isotopes on a Ge(Li) detector.

Charcoal canisters were routinely counted in groups of five to determine the presence or absence of I-131. Positive indication of airborne I-131 would have been supplemented by separate analysis of individual canisters for each location.

Air samples were collected from the three sectors with the highest ground level D/Q, the nearby community of New Strawn, and a control location. Distances and directions to sampling locations from the plant site are

listed in Table 2; locations are shown in Figure 1 (nearby locations) and Figure 5 (distant locations).

Direct Radiation:

The thermoluminescent dosimeter (TLDs) used during 1990 were provided by Teledyne Isotopes. The TLDs consisted of rectangular teflon wafers impregnated with CaSO4:Dy. Prior to placement in the field, the dosimeters were annealed for at least one hour at between 250 and 260 degrees centigrade, then placed in polyethylene pouches and holders containing 0.022 or 0.093 inches of copper shielding to filter out low energy radiation. New field dosimeters were exchanged with the exposed dosimeters and the exposed dosimeters were returned to Teledyne Isotopes for analysis. Freshly annealed control dosimeters were sent with the exposed TLDs to record transit exposures received during shipment as well as system background of the TLD reader.

Gamma exposures were measured on a Teledyne Model 8300 TLD reader; individual dosimeters were then re-irradiated with a known exposure from a Cs-137 source and read again to determine individual dosimeter calibration factors.

In general, TLDs were located 3-4 feet above the ground on utility poles; they were placed inside either plastic thermostat boxes or fiberglass air particulate sampler housings to protect them from moisture and tampering. Two TLDs were placed at each location to provide duplicate measurements. TLD locations are shown on Figure 2 (plant vicinity and Figure 5 (distant). Table 2 provides distances and directions of each location from the WCGS site.

Waterborne:

Drinking, Surface, and Ground Water:

Monthly composite samples of drinking water were obtained by collecting aliquots at one hour intervals. Grab samples of surface and ground water were collected on a monthly and quarterly basis, respectively. All samples were sent to Teledyne Isotopes for analysis.

All water samples were analyzed on a Ge(Li) detector to determine if gamma emitters were present. In addition to gamma analysis, a 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 by liquid scintillation counting on a quarterly basis for drinking water and on a monthly basis for surface water. Tritium analysis for ground water was performed quarterly by gas counting.

Drinking water sampling locations are at the water treatment stations for the towns of Burlington (upstream control location) and LeRoy (downstream indicator location). Surface water sampling locations are at the John Redmond Reservoir outfall (control), Wolf Creek Cooling Lake discharge cove (indicator), and Wolf Creek Cooling Lake main dam (indicator). Ground water is sampled from three wells located hydrologically downgradient from Wolf Creek Cooling Lake and from an upgradient control well. All water sampling locations are listed in Table 2 and shown in Figures 3 and 5.

Shoreline and Bottom Sediment:

Semiannual samples of shoreline and bottom sediment were collected from the discharge cove area (location "DC" on Figure 3) of Wolf Creek Cooling Lake. Control samples were added for shoreline and bottom sediment at John Redmond Reservoir during the last half of 1990. Also, special bottom sediment samples were obtained in the Ultimate Heat Sink (UHS). Gamma analysis was performed on each sample.

Aquatic Vegetation/Algae:

Semiannual samples of aquatic vegetation/algae were collected from the discharge cove area (location "DC" on Figure 3) of Wolf Creek Cooling Lake. Gamma analysis was performed on each sample.

Ingestion:

Milk:

Milk samples were collected on a semi-monthly basis from April through November (while milk animals were on pasture grass) and on a monthly basis the remainder of the year (when animals were on stored feed). Samples were sent to Teledyne Isotopes where radiochemical analyses for I-131 and gamma analyses were performed on each sample. Locations are shown in Figures 4 and 5.

Broadleaf Vegetation and Irrigated Crops:

Broadleaf vegetation samples were collected monthly during the growing season. Alternate sampling locations were also used when quantities of vegetation were limited, such as early or late in the growing season or during dry periods. Additionally, samples of crops irrigated with water from the Neosho River upstream and downstream of the discharge from Wolf Creek Cooling Lake were collected during harvest. All vegetation samples were sent to Teledyne Isotopes and analyzed by gamma spectroscopy. Locations are shown in Figures 4 and 5.

Fish:

Fish samples were collected semi-annually from Wolf Creek Cooling Lake (indicator) and John Redmond Reservoir (control) with several important recreational species being sampled. Samples of boneless meat portions were sent to Teledyne Isotopes and analyzed by gamma spectroscopy. Locations are shown in Figure 4.

Game Animals and Birds:

Annual samples of endemic game animals and birds were obtained from the immediate vicinity of Wolf Creek Cooling Lake (indicator) and John Redmond Reservoir (control). Samples of boneless meat portions were sent to Teledyne Isotopes and analyzed by gamma spectroscopy.

## II. DISCUSSION OF RESULTS

Analysis results for all pathways are summarized in Appendix A using the format described in NRC Radiological Assessment Branch Technical Position, Revision 1, November 1979; results for individual samples are listed in Appendix B.

In this section, results are discussed by pathway and analysis type. Operational results are related to control location results, preoperational values, sources of radioactivity, and effluent releases when applicable. Trends or seasonal effects seen in the data are also discussed.

### Airborne:

Results of gross beta analysis of weekly air particulate filters are shown in Table 3. In addition, the four indicator locations are averaged and plotted graphically with the control location in Figure 6. Finally, Figure 7 shows the percent of the indicator average to the control location measurement. Both of these figures demonstrate how closely the indicator and control locations track together.

Results from the weekly analysis of charcoal filters for I-131 showed no concentration above the detection limit during the year.

Results of the quarterly gamma analysis of air particulate filter composites are summarized in Table 4, which shows that naturally occurring Be-7 and K-40, were detected regularly, as was the case during preoperational monitoring.

No effects of plant operation were seen via the airborne pathway for the year.

### Direct Radiation:

Quarterly gamma exposures measured at each location for 1990 are shown in Table 5. Values are normalized to a standard 90-day quarter.

Results from TLDs located near the plant site (less than approximately three mile distant), which would be most sensitive to changes due to plant operation, were combined into quarterly averages. These nearsite averages, using locations 1, 2, 7, 8, 9, 10, 11, 12, 13, 14, 18, 25, 27, 28, 29, 30, 37, and 38, are compared to control TLD (locations 39 and 40) results in Figure 8. In addition, the percentage of the nearsite averages to the control locations results are displayed graphically in Figure 9. These figures also include preoperational data for comparison.

A change has been made to the shielding thickness used with the TLDs. The

old thickness (0.022 inches) was undercompensating for the over-response to low energy gammas; therefore, the proper shield (0.093 inches) was installed the fourth quarter of 1990. This has caused an average drop in the measurements of less than 2 mrem over the standard quarter when compared to measurements taken using the 0.022 inch shield during the same time period. This change is described fully in the program deviation section of this report but is mentioned here since the results have been affected slightly, but insignificantly, by the shielding change.

No changes to area gamma exposure rates as a result of plant operation were identified.

Waterborne:

Since tritium has been appearing in water samples surrounding Wolf Creek a detailed evaluation of tritium monitoring and concentrations in the environment was performed during 1990. The results of this evaluation are in Appendix C.

Drinking Water:

Results of gross beta analysis of drinking water samples are listed in Table 6; Figure 10 depicts these results graphically along with preoperational values for comparison.

There was an unusually high value for gross beta seen in the February sample at LeRoy (LW-40). This value was verified with a follow-up analysis for gross beta. The gamma isotopic analysis for the sample failed to show any detectable gamma emitters and a visual inspection of the residue used for the measurement did not show any abnormal colors or densities. Also the quarterly composite for tritium was less than detectable. In summary, the gross beta must be considered a valid result but none of the other testing supports the higher value obtained for February.

Tritium was detected at both BW-15 (control) and LW-40 (indicator) in the third quarter composite. At BW-15 the concentration was 1600 $\pm$ 400 pCi/liter and at LW-40 the concentration was 860 $\pm$ 340 pCi/liter; the detection limit is 700-900 pCi/liter. The tritium detected at these locations are not due to plant effluents since the tritium was seen at the control location as well as the indicator location.

Surface Water:

Tritium, attributable to WCGS operation, was detected in all surface water samples collected from WCCL in 1990. A total of 590 Curies were released to WCCL during the year. Measured concentrations are shown in Table 7. In

Figure 11, WCCL tritium concentrations are plotted since WCGS began operation.

It can be seen in Figure 11 that monthly surface water tritium concentrations appear to be slightly increasing since plant startup. This is expected until the lake concentration reaches equilibrium. (See discussion on equilibrium concentrations in Appendix C, page C-4.)

A peak concentration of 9,000 pCi/liter occurred in November when the monthly grab sample was obtained shortly after the termination of a batch release. Since the sample point is just beyond the near field mixing zone, complete mixing had not occurred. The peak concentration is seen in Table 7 and Figure 11.

All tritium concentrations measured were below applicable reporting levels.

There were no gamma emitters related to plant operation detected in surface water for the year.

An additional surface water location was added to the sample collections in August in preparation for moving the location along the WCCL Main Dam several yards east of the present location. The new location is beside the auxiliary spillway which allows discharges into Wolf Creek. The results obtained from August through December indicate moving the sample location will not have any affect on the analysis results.

Ground Water:

No tritium or gamma emitters were detected in any of the quarterly ground water samples in 1990.

Shoreline Sediment:

Table 8 shows gamma emitters detected in shoreline sediment collected from Wolf Creek Cooling Lake and John Redmond Reservoir during 1990. In addition to the naturally occurring nuclides (Be-7, K-40, Ra-226, and Th-228), two other radionuclides were detected.

Co-60, an activation product, was detected in the sample collected on October 16, 1990. This activity is attributed to plant operations rather than fallout from nuclear weapons testing.

The other nuclide, Cs-137, was detected in both samples but the activity measured is considered to be primarily due to fallout rather than plant operations since the concentration is at or below preoperation concentrations. Also, Cs-134 was not detected, although it would be expected if the occurrence of Cs-137 was related to plant operation.

Bottom Sediment:

Table 8 shows gamma emitters detected in bottom sediment samples collected from Wolf Creek Cooling Lake and John Redmond Reservoir during 1990. In addition to the naturally occurring nuclides (K-40, Ra-226, and Th-228), several other radionuclides were detected.

Co-58 and Co-60 are activation products whose presence in the WCCL samples is attributed to plant operation.

The Cs-137 concentrations measured are considered to be primarily due to fallout rather than plant operation since they are at or below concentrations measured preoperationally and are comparable to the concentrations seen in the control sample from John Redmond Reservoir. Also, Cs-134 was not detected although it would be expected if the occurrence of Cs-137 was related to plant operation.

Aquatic Vegetation:

A combination of naturally occurring nuclides, fission products, and activation products were detected in algae samples from the WCCL discharge cove during the year. Rooted aquatic vegetation was not available again this year. A summary of the concentrations measured is shown in Table 9.

Naturally occurring nuclides measured were Be-7, K-40, Ra-226, and Th-228.

Activation products seen in the samples were Mn-54, Co-58, and Co-60; all of these are attributable to operational releases.

Fission product Cs-137 was detected in both algae samples while Cs-134 was only seen in the sample collected 9/18/90. The fission products seen in the algae samples are due to fallout and possibly plant effluents. The concentration of Cs-137 measured in both algae samples is within the range of concentrations measured during the preoperational phase of environmental monitoring but the detection of Cs-134 implies a recent source of activity.

Ingestion:

Milk:

There were no indicator samples available during 1990 (see Program Deviation section for explanation). A control sample was routinely obtained for analysis. All milk samples analyzed contained naturally occurring K-40 at concentrations consistent with preoperational levels. The yearly average concentration was 1260 pCi/liter.

No other gamma emitters were detected.

Broadleaf Vegetation:

Gamma analysis of broadleaf vegetation samples revealed naturally occurring gamma emitters K-40 and Be-7 at concentrations comparable to preoperational and background levels.

Cs-137 was also detected at Locations R-1 (indicator) and S-4 (control) during May. The concentrations were 0.0175 pCi/gm and 0.323 pCi/gm respectively. These concentrations for Cs-137 are attributed to fallout for the following reasons: 1) The range of fallout Cs-137 seen in preoperational samples was 0.0131 to 0.0478 pCi/gm. 2) Cs-137 was not detected in the airborne effluent releases from the plant during the second quarter of 1990. 3) Cs-134 was not detected, although it would be expected if the occurrence of Cs-137 was related to plant operation (Cs-134 decays with a shorter halflife than Cs-137; detection of Cs-137 alone indicates fallout as opposed to newly produced fission products).

No other gamma emitters were detected for the remainder of the year, and no effects of plant operation were identified.

Irrigated Crops:

Gamma analysis revealed naturally occurring K-40 to be present in the samples, with no nuclides detected which could be attributable to plant operation.

Fish:

Naturally occurring K-40 was found in all fish samples collected with an average concentration of 4.05 pCi/gm (wet weight) for WCCL samples and 4.81 pCi/gm (wet weight) for the control samples. These concentrations are within the range seen during the preoperational period.

In addition, one sample from WCCL, collected on 10/2/90, contained detectable levels of Cs-137 at 0.0404 pCi/gm (wet weight). Although fallout Cs-137 is regularly measured in other environmental media and is probably reflected in these values, it is assumed that these concentrations are attributable to WCGS operational releases since Cs-137 was not detected during the preoperational testing or in control samples.

A dose calculation for a hypothetical individual, assuming a maximum ingestion rate (16 kg per year from Reg. Guide 1.109) at the measured Cs-137 concentration results in an annual dose of 0.096 mrem (critical age group = teen, critical organ = liver).

No other radionuclides were detected in fish during the year.

Game Animal and Bird:

Naturally occurring K-40 was measured in all game animal and bird samples at concentrations consistent with preoperational levels.

No other radionuclides were detected and no effects of plant operation were seen for this pathway.

## III. ANNUAL LAND USE SURVEY RESULTS AND PROGRAM REVISIONS

The purpose of the Land Use Census is to identify within a distance of 5 miles the location in each of the 16 meteorological sectors of the nearest residence, the nearest milk animal and the nearest garden of greater than 50 square meters producing broadleaf vegetation.

The 1990 Annual Land Use Survey was completed in October. Information was collected using a combination of mailed survey forms, telephone contacts, and door-to-door contacts.

Comparing the 1989 census results to this year the nearest resident has changed in Sectors B and P. In Sector B the nearest resident is no longer 1.8 miles from the plant at location B-10; the new location (B-2) is further from the plant at 3.1 miles. In Sector P the distance to the nearest resident decreased from 2.9 to 2.8 miles. The nearest resident is at P-26 just south of New Strawn. The previous nearest resident was at P-2 just east of New Strawn.

Several changes were noted in the distance to the nearest milk animal. Milk animals were identified in Sectors A and B this year where they had not been identified in the 1989 Land Use Census. As in 1989, milk animals were identified in Sectors D, F, and M, but the distance to the nearest milk animal in Sector D increased from 2.3 miles to 2.4 miles. Milk animals are no longer present in Sector G, specifically location G-6.

At location F-13, the resident has one female goat. The resident did not indicate whether the goat was producing milk but the owner did indicate any milk produced would not be used for human consumption. The milk from the cows in Sectors A and B is used only to nurse the young animals and will not be used for human consumption. Therefore as samples are unavailable, sampling at these locations is not possible.

At location M-19, the cattle are for breeding purposes only and the milk will not be used for human consumption. This is a change from last year when the cattle were allowed to graze at that location until they were ready to produce milk, they were then transferred to a location near LeRoy and fed on stored feed during the lactation period. Sampling at this location is not possible.

In Sector D the nearest milk animal has moved from D-2, where the resident indicated he no longer kept milk animals, to location D-3 which is slightly further from the plant. The resident at D-3 indicated he does occasionally drink the milk from these cows even though the milk is used primarily to nurse young calves. When asked to participate in the Radiological Environmental Monitoring Program the resident refused, therefore sampling at this location will not be possible.

Several location changes were noted for the nearest garden in Sectors C, E, H, J, L, N, and Q. In all of these sectors (except N) the distance to the

nearest garden either remained the same, even though the actual location changed, or increased. In sector N there are no gardens within five miles of the plant producing broadleaf vegetation. None of the existing broadleaf vegetation sampling locations are affected by the location changes in these sectors.

Based on the data obtained from the 1990 Land Use Census no changes are required for the Radiological Environmental Monitoring Program. As in the past, it should be noted that dose calculations are performed for airborne and liquid pathways for a hypothetical individual at the exclusion area boundary in the highest X/Q and D/Q sector (for airborne pathways) and at the circulating water discharge point (for liquid pathways). Calculated doses are therefore not affected by changes in residence, milk animal, and broadleaf vegetation locations identified by the Annual Land Use Survey.

## IV. MONITORING PROGRAM DEVIATIONS

Airborne:

Location 37 (1/23/90 - 1/30/90): The charcoal canister was not seated properly on the gasket, allowing air leakage in the sampling train. Deposition on the filter was light and the measured gross beta concentration was approximately 60% lower than the average concentration for the four other indicator locations. The reported value for location 37 during this week was therefore considered to be erroneously low.

All personnel involved in sample collections were informed of this event and cautioned to check the air samplers for proper suction when performing air samples changeouts.

All Locations ( 6/26/90 - 7/10/90): When performing air sample changeouts on 7/3/90 air sample flows were determined incorrectly. The error occurred when the calibration graph was misinterpreted. The graph reads Pump Flowmeter Reading vs Mass Flowmeter Reading (or indicated flow vs actual flow). The graphs were interpreted as actual vs indicated. This error caused total sample volumes calculated for two sample periods (6/26/90 - 7/3/90 and 7/3/90 - 7/10/90) to be erroneously high and consequently the sample activity per unit volume to be low.

The high pump flows were noted when reviewed by the Program Coordinator on 7/9/90 but discussions with personnel involved did not indicate a problem with the sampler or sample techniques. It was not discovered until 7/10/90, during another training session on air sampling, that the calibration graph had been interpreted incorrectly.

All personnel involved in sample collections were informed of this event and assigned required reading for graph interpretation. The correct volumes for those two weeks were determined and used to correct the sample analysis results for air particulate gross beta and charcoal filter radioiodine.

Location 37 (10/16/90 - 10/23/90): The air sample pump at this location was removed from service on 10/23/90 when a significant flow increase was noted for the week. The air sampler was examined and the calibration curve was verified. The calibration curve was still valid but the seal around the charcoal filter was difficult to achieve. The charcoal filter holder was replaced to alleviate this problem. The sample activity results were reviewed for this week and the results at this location were consistent with the results at the other indicator locations.

Direct Radiation:

Location 10 (First Quarter): One of the TLDs at this location was

missing, probably due to an act of vandalism. The second TLD was located on the ground at the sample location and sent in for analysis. Since vandalism is beyond the control of WCGS there were no corrective actions taken.

Location 16 (First Quarter): One the of TLDs was missing, probably due to an act of vandalism. The second TLD was still attached to the utility pole and sent in for analysis. Again, since vandalism is beyond the control of WCGS and appears to be an infrequent occurrence, there were no corrective actions taken.

Location 21 (First Quarter): One of the TLDs at this location was apparently not removed at the end of the fourth quarter of 1989 and left for two quarters. The results from the TLD in question were approximately two times higher than the second TLD at this location and the wrong color label was on the TLD. Also, as noted in the 1989 Annual Radiological Environmental Operating Report one of the TLDs at this location for the fourth quarter of 1989 was analyzed as having a negative dose and had the wrong color label, indicating the TLD had never been in the field. The value from the second TLD at this location was used as the recorded exposure at this location.

Location 16 (Third Quarter): On one of the TLDs at this location half of the copper shield in the holder was missing. A review of the results did not show any significant difference between the two TLDs at this location therefore both TLDs were used in determining the recorded exposure.

All Locations: During the reporting period, it was determined the TLD cases did not have the proper shield thickness to prevent the TLDs from over-responding to low energy gamma radiation. The WCGS program includes a requirement that the detection capabilities for thermoluminescent dosimeters used for environmental measurements to be in accordance with the recommendations of Regulatory Guide 4.13, Revision 1, July 1977, "Performance, Testing, and Procedural Specifications for Thermoluminescent Dosimetry: Environmental Applications" and ANSI N545-1975, "Performance, Testing, and Procedural Specifications for Thermoluminescence Dosimetry (environmental applications)". Vendor documentation indicates the copper shield thickness for the TLD cases necessary to meet the requirements for energy response in the Regulatory Guide and ANSI standard is 0.093 inches. Contrary to this requirement, the thickness of copper shields used was 0.022 inches. The 0.022 inch shields for the TLD cases were purchased prior to the issuance of the WCGS Technical Specifications and have been used since 1981. This deviation constitutes a program deviation since the TLDs did not fully meet the recommendations of Regulatory Guide 4.13.

Since the discovery of this programmatic deviation, several corrective actions have taken place:

Discussions with the vendor to determine the impact of the 0.022 inch shield on the TLD measurements have indicated the error associated with the shield variation would be in a conservative direction since the TLD would over

respond by up to 2.5 times depending on the gamma ray energy for that component of the gamma ray spectrum. The vendor indicated that when exposed to cosmic rays and normal terrestrial background, TLDs, whether shielded by 0.022 inch or 0.093 inch copper, read the same dose. TLD results, when compared to TLD results of the Kansas Department of Health and Environment and Nuclear Regulatory Commission, measured for the past several years are at normal background exposure levels.

New TLD cases with the 0.093 inch shield were placed in the field for the fourth quarter of 1990 along with the 0.022 inch shield to make an actual comparison of the exposure measurements. This will continue through the second quarter of 1991 to determine the magnitude of the difference. At this time the difference is not believed to be significant. WCGS has acquired cases with 0.093 shields and will be using them in conjunction with the current TLD type in future measurements in order to meet the TLD response characteristics listed in Regulatory Guide 4.13.

This program deviation was evaluated against the WCGS Technical Specification reporting requirements for the Radiological Environmental Monitoring Program. It was determined that reporting this program deviation in the Annual Radiological Environmental Operating Report under monitoring program deviations would fulfill the reporting requirements.

Waterborne:

Drinking Water:

Location LW-40 (2/90 - 3/90): A malfunction of the composite water sampler at LW-40 was discovered during a site visit on 2/26/90. The malfunction involved the submersion of electronic components of the sampler in water after a period of time during which water was pumped into the sampling chamber but was not removed during the purge cycle. Once the water level reached the electronic components at the top of the chamber, the sampler ceased to function. Upon discovery of the problem the sampler was drained of the excess water that had accumulated and removed from the sample location. It is thought that the malfunction may have been due to construction activities at the water treatment facility. The sampler had been moved from its normal location by painters and, in the process, the sample line had been at least partially pinched shut. The resulting restriction to flow may have prevented the sampler from completing the purge cycle properly. Another sampler could not be installed because of construction activities where the sampler is located.

Following the replacement of the electronic components of the sampler and the completion of construction activities, the sampler was reinstalled at LW-40 on 3/12/90. Due to the interruption of sampling caused by this malfunction, the February and March drinking water samples are not composite samples for the entire month.

Location LW-40 (12/90): During a routine check of the composite water sampler at LW-40 on December 18, 1990, it was noticed the sampler was not functioning. The sampler was not receiving power due to a failed breaker in the electrical circuit supplying power to the outlet. LeRoy city personnel repaired the breaker on 12/19/90 and the sampler was returned to service on 12/21/90. It is not known how long the sampler was out-of-service (the sampler was last checked 12/6/90) but the sampler container was half full on 12/18/90. This is normal after two weeks of operation and implies the out-of-service time was quite short. Since the root cause of the sampler malfunction was out of our control we have not taken any corrective actions to prevent recurrence.

Ingestion:

Milk:

There were no deviations in milk sampling; however, there are still no indicator sampling locations available within five miles on the plant. This is detailed in the Annual Land Use Survey Results and Program Revisions.

Broadleaf Vegetation:

The growing season for broadleaf vegetation was extremely poor this year therefore, several of the monthly samples were not available. Adverse growing conditions such as a wet spring followed by a very dry summer caused a short growing season at our sample locations.

All Locations (4/90): Samples were not available.

Location A-1 and G-1 (5/90): Samples were not available.

Location G-1 (8/90): Sample was not available.

Location R-1 (8/90): Unable to obtain enough sample to meet LLD.

Location S-4, R-1, and G-1 (9/90): Samples were not available.

Location S-4 and R-1 (10/90): Samples were not available.

Location S-4, R-1, and A-1 (11/90): Samples were not available.

No corrective actions were necessary since the schedule directs these samples to be collected 'as available' during the growing season and when the primary sample locations A-1 and R-1 were unavailable the alternate location G-1 was available.

## V. EPA INTERLABORATORY COMPARISON PROGRAM RESULTS

Teledyne Isotopes, contracted to perform analysis of radiological environmental samples for WCNOC, participated in the EPA Interlaboratory Comparison Program during 1990.

Table 11 shows intercomparison test results received during the year. The table lists the collection date, the sample media, the nuclide or analysis type, the known value reported by the EPA, and the measured value reported by Teledyne Isotopes (based on triplicate analysis). Results are listed in the table for the sample media and analysis types corresponding to those performed for WCNOC.

Ru-106 result for the water sample with a collection date of 2/9/90 was lower than the EPA value. No apparent cause for the low result was found. Three aliquots of the sample were counted on three separate detectors. The results of all three were similar. The calibration curve fit was good (0.997). Ruthenium-106 was obtained from the EPA. Results of spikes were acceptable. Subsequent EPA cross-checks did not exceed two normalized standard deviations. No additional follow-up is necessary but monitoring of results will continue.

Ba-133 result for the water sample with a collection date of 10/15/90 was lower than the EPA value. All other isotopes in the sample were measured accurately. The calculations were reconfirmed.

TABLE 1

1990 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
SAMPLE COLLECTION

| EXPOSURE PATHWAY/ SAMPLE | NUMBER OF SAMPLES AND SAMPLE LOCATIONS | SAMPLING AND COLLECTION FREQUENCY | TYPE AND FREQUENCY OF ANALYSIS |
|---|---|---|---|
| AIRBORNE | | | |
| Iodine & particulates | Samples from five locations<br><br>Samples from locations near the site boundary in three sectors having the highest calculated annual average D/Q (Locations 2, 3 and 37 on Figure 1);<br><br>Sample from the vicinity of a community having the highest calculated annual average D/Q (Location 32 on Figure 1, New Strawn);<br><br>Sample from a control location 10 - 20 miles distant in a low D/Q sector (Location 40 on Figure 5). | Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading. | Analyze radioiodine canister weekly for I-131.<br><br>Analyze particulate filter weekly for gross beta activity; perform quarterly gamma isotopic analysis composite (by location). |
| DIRECT RADIATION | | | |
| | 40 routine monitoring stations with two or more dosimeters measuring dose continuously, placed as follows: | Quarterly | Gamma dose quarterly |

TABLE 1 (cont'd)

1990 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
SAMPLE COLLECTION

| EXPOSURE PATHWAY/ SAMPLE | NUMBER OF SAMPLES AND SAMPLE LOCATIONS | SAMPLING AND COLLECTION FREQUENCY | TYPE AND FREQUENCY OF ANALYSIS |
|---|---|---|---|
| DIRECT RADIATION (cont'd) | | | |
| | An inner ring of stations, one in each meteorological sector 0 - 3 mile range from the site (Locations 1 - 14, 18, 26 - 31, 37, and 38 on Figure 2). | | |
| | An outer ring of stations, one in each meteorological sector 3 - 5 mile range from the site (Locations 15, 16, 17, 19 - 22, 24, 25, and 32 - 36 on Figure 2). | | |
| | The balance of the stations to be placed in special interest areas such as population centers (Locations 23 and 32), nearby residences (Many locations are near a residence), schools (Location 23), and in one or two areas to serve as control stations 10 - 20 miles distant from the site (Locations 39 and 40). (Locations are on Figures 2 and 5) | | |
| | Locations 41, 42, and 43 on Figure 2 are not part of the required program but have been added as special interest locations. | | |

TABLE 1 (cont'd)

1990 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
SAMPLE COLLECTION

| EXPOSURE PATHWAY/ SAMPLE | NUMBER OF SAMPLES AND SAMPLE LOCATIONS | SAMPLING AND COLLECTION FREQUENCY | TYPE AND FREQUENCY OF ANALYSIS |
|---|---|---|---|
| WATERBORNE | | | |
| Surface | One sample upstream (Location MUSH on Figure 3) and two samples downstream (Locations DC and SP on Figure 3)<br><br>An additional sample, SP(ALT), in the same vicinity as SP has been added in preparation for relocating SP. | 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.<br><br>Indicator samples at locations hydrologically downgradient of the site (Locations C-10, C-49 and D-65 on Figure 3); Control sample at a location hydrologically upgradient of the site (Location B-12 on Figure 3). | Quarterly | Quarterly gamma isotopic and tritium analysis. |
| 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 composite. |

TABLE 1 (cont'd)

1990 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
SAMPLE COLLECTION

| EXPOSURE PATHWAY/ SAMPLE | NUMBER OF SAMPLES AND SAMPLE LOCATIONS | SAMPLING AND COLLECTION FREQUENCY | TYPE AND FREQUENCY OF ANALYSIS |
|---|---|---|---|
| WATERBORNE (cont'd) | | | |
| Shoreline Sediment | One sample from the vicinity of Wolf Creek Cooling Lake discharge cove (Location DC on Figure 3) and one sample from John Redmond Reservoir (Location JRR on Figure 3). | Semiannually | Semiannual gamma isotopic analysis. |
| Bottom Sediment | One sample from the vicinity of Wolf Creek Cooling Lake discharge cove (Location DC on Figure 3) and one sample from John Redmond Reservoir (Location JRR on Figure 3). Special samples were taken in the vicinity of the Ultimate Heat Sink. | Semiannually | Semiannual gamma isotopic analysis. |
| Rooted Aquatics or Algae | One sample from the vicinity of Wolf Creek Cooling Lake discharge cove (Location DC on Figure 3). | Semiannually | Semiannual gamma isotopic analysis. |
| INGESTION | | | |
| Milk | Samples from milking animals at three indicator locations within 5 miles of the site having the highest dose potential (currently there | Semimonthly while animals are on pasture (April to November); monthly at other times (December to March). | Gamma isotopic analysis and I-131 analysis of each sample. |

TABLE 1 (cont'd)

1990 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
SAMPLE COLLECTION

| EXPOSURE PATHWAY/ SAMPLE | NUMBER OF SAMPLES AND SAMPLE LOCATIONS | SAMPLING AND COLLECTION FREQUENCY | TYPE AND FREQUENCY OF ANALYSIS |
|---|---|---|---|
| INGESTION (cont'd) | | | |
| Milk (cont'd) | 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 (Location S-3 on Figure 5). | | |
| Fish | Indicator samples of 1 to 3 recreationally important species from Wolf Creek Cooling Lake (several sampling areas indicated on Figure 4); control samples of similar species from John Redmond Reservoir indicated on Figure 4). | Semiannually | Gamma isotopic Analysis on edible portions. |
| Broadleaf Vegetation | Samples of available broadleaf vegetation from two indicator locations with highest calculated annual average D/Q (Locations A-1 and R-1 and alternate Location G-1 on Figure 4); sample of similar broadleaf vegetation from a control location greater than 10 miles from the site in a low D/Q sector (Location S-4 on Figure 5). | Monthly when available | Gamma isotopic analysis on edible portions. |

TABLE 1 (cont'd)

1990 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
SAMPLE COLLECTION

| EXPOSURE PATHWAY/ SAMPLE | NUMBER OF SAMPLES AND SAMPLE LOCATIONS | SAMPLING AND COLLECTION FREQUENCY | TYPE AND FREQUENCY OF ANALYSIS |
|---|---|---|---|
| INGESTION (cont'd) | | | |
| Irrigated Crops | Sample of crops irrigated with water from the Neosho River downstream of the Neosho River - Wolf Creek confluence (Location NR-D2 on Figure 5). Control sample of crops irrigated with water from the Neosho River upstream of the Neosho River - Wolf Creek confluence (Location NR-U1 on Figure 5). | At time of harvest | Gamma isotopic analysis on edible portions. |
| Game birds and animals | Indicator samples of region specific recreationally important species from the vicinity of Wolf Creek Lake; control samples of similar species from the vicinity of John Redmond Reservoir. | Annually | 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 |
|---|---|---|---|---|---|
| **TLD and Air Particulate** | | | | | |
| 1 | 1.4/N | 15 | 4.5/ESE | 29 | 2.6/SSW |
| 2 | 2.7/N | 16 | 4.2/E | 30 | 2.2/W |
| 3 | 3.0/NNE | 17 | 3.6/SE | 31 | 3.0/WNW |
| 4 | 4.0/NNE | 18 | 3.2/SSE | 32 | 3.2/WNW |
| 5 | 4.0/NE | 19 | 4.0/SSE | 33 | 3.7/WNW |
| 6 | 4.4/ENE | 20 | 3.3/S | 34 | 4.0/NW |
| 7 | 1.9/NE | 21 | 3.8/S | 35 | 4.6/NNW |
| 8 | 1.6/NNE | 22 | 4.1/SSW | 36 | 4.2/N |
| 9 | 2.0/ENE | 23 | 4.5/SW | 37 | 2.1/NNW |
| 10 | 2.4/ENE | 24 | 4.1/WSW | 38 | 1.2/NW |
| 11 | 1.5/E | 25 | 3.6/W | 39 | 13.0/N |
| 12 | 1.8/ESE | 26 | 2.6/WSW | 40 | >15.0/WNW |
| 13 | 1.5/SE | 27 | 2.1/SW | 41 | 0.8/NNW |
| 14 | 2.6/SE | 28 | 2.8/SW | 42 | 0.8/SSE |
| | | | | 43 | 0.8/WNW |
| **Ground Water** | | **Drinking Water** | | **Surface Water** | |
| B-12 | 2.2/NNE | BW-15 | 3.9/SW | MUSH | 3.6/W |
| C-10 | 2.8/W | LW-40 | 10/SSE | DC | 0.6/WNW |
| C-49 | 2.9/SW | | | SP | 2.9/S |
| D-65 | 3.9/S | | | SP(ALT) | 2.9/S |
| **Milk** | | **Broadleaf Vegetation** | | **Irrigated Crops** | |
| S-3 | >15.0/WNW | A-1 | 1.4/N | NR-U1 | 4.2/SW |
| | | R-1 | 2.1/NNW | NR-D2 | >10.0/S |
| | | G-1 | 1.6/SE | | |
| | | S-4 | >15.0/WNW | | |
| **Fish** | | **Shoreline and Bottom Sediment** | | **Aquatic Vegetation /Algae** | |
| WCCL | 0.6/WNW | DC | 0.6/WNW | DC | 0.6/WNW |
| JRR | 4/W | JRR | 4/W | | |
| | | UHS | 0.6/E | | |
| **Game Birds and Animals** | | | | | |
| WCCL | General Vicinity | | | | |
| JRR | General Vicinity | | | | |

TABLE 3

1990 AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS RESULTS

($pCi/m^3$)

| DATE | INDICATOR LOCATIONS LOC 2 | LOC 3 | LOC 32 | LOC 37 | INDICATOR AVERAGE | STANDARD DEVIATION | CONTROL LOC 40 |
|---|---|---|---|---|---|---|---|
| 1/2-1/9 | .033 | .038 | .032 | .034 | .0343 | .0026 | .031 |
| 1/9-1/16 | .024 | .027 | .023 | .024 | .0210 | .0017 | .021 |
| 1/16-1/23 | .050 | .047 | .045 | .050 | .0480 | .0024 | .043 |
| 1/23-1/30 | .026 | .026 | .026 | .010 | .0220 | .0080 | .024 |
| 1/30-2/6 | .035 | .036 | .032 | .034 | .0343 | .0017 | .034 |
| 2/6-2/13 | .032 | .031 | .034 | .031 | .0320 | .0014 | .032 |
| 2/13-2/20 | .033 | .031 | .033 | .033 | .0325 | .0010 | .033 |
| 2/20-2/27 | .026 | .025 | .028 | .031 | .0275 | .0026 | .029 |
| 2/27-3/6 | .033 | .029 | .032 | .033 | .0318 | .0019 | .032 |
| 3/6-3/13 | .023 | .024 | .026 | .020 | .0232 | .0025 | .023 |
| 3/13-3/20 | .021 | .019 | .019 | .023 | .0205 | .0019 | .021 |
| 3/20-3/27 | .025 | .029 | .032 | .029 | .0288 | .0029 | .030 |
| 3/27-4/3 | .015 | .017 | .014 | .025 | .0178 | .0050 | .024 |
| 4/3-4/10 | .027 | .029 | .024 | .028 | .0270 | .0022 | .029 |
| 4/10-4/17 | .027 | .025 | .032 | .034 | .0295 | .0042 | .033 |
| 4/17-4/24 | .026 | .024 | .027 | .024 | .0253 | .0015 | .024 |
| 4/24-5/1 | .018 | .015 | .019 | .020 | .0180 | .0022 | .015 |
| 5/1-5/8 | .023 | .022 | .025 | .023 | .0232 | .0013 | .020 |
| 5/8-5/15 | .019 | .018 | .020 | .019 | .0190 | .0008 | .019 |
| 5/15-5/22 | .019 | .021 | .021 | .024 | .0213 | .0021 | .021 |
| 5/22-5/29 | .027 | .022 | .029 | .024 | .0255 | .0031 | .024 |
| 5/29-6/5 | .022 | .022 | .023 | .022 | .0222 | .0005 | .023 |
| 6/5-6/12 | .021 | .021 | .020 | .022 | .0210 | .0008 | .024 |
| 6/12-6/19 | .019 | .021 | .019 | .022 | .0203 | .0015 | .021 |

TABLE 3 (cont'd)

1990 AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS RESULTS

($pCi/m^3$)

| DATE | INDICATOR LOCATIONS LOC 2 | LOC 3 | LOC 32 | LOC 37 | INDICATOR AVERAGE | STANDARD DEVIATION | CONTROL LOC 40 |
|---|---|---|---|---|---|---|---|
| 6/19-6/26 | .026 | .027 | .028 | .027 | .0270 | .0008 | .028 |
| 6/26-7/3 | .024 | .026 | .030 | .029 | .0272 | .0028 | .029 |
| 7/3-7/10 | .026 | .028 | .031 | .028 | .0283 | .0021 | .028 |
| 7/10-7/17 | .025 | .028 | .028 | .027 | .0270 | .0014 | .030 |
| 7/17-7/24 | .021 | .024 | .019 | .020 | .0210 | .0022 | .018 |
| 7/24-7/31 | .026 | .028 | .029 | .032 | .0288 | .0025 | .027 |
| 7/31-8/7 | .019 | .020 | .023 | .022 | .0210 | .0018 | .023 |
| 8/7-8/14 | .026 | .024 | .025 | .028 | .0258 | .0017 | .023 |
| 8/14-8/21 | .024 | .021 | .021 | .024 | .0225 | .0017 | .024 |
| 8/21-8/28 | .026 | .024 | .027 | .029 | .0265 | .0021 | .024 |
| 8/28-9/4 | .038 | .035 | .041 | .040 | .0385 | .0026 | .034 |
| 9/4-9/11 | .037 | .029 | .032 | .034 | .0330 | .0034 | .027 |
| 9/11-9/18 | .025 | .023 | .022 | .023 | .0232 | .0013 | .022 |
| 9/18-9/25 | .020 | .022 | .024 | .025 | .0227 | .0022 | .023 |
| 9/25-10/2 | .035 | .037 | .04 | .042 | .0385 | .0031 | .036 |
| 10/2-10/9 | .023 | .025 | .026 | .023 | .0243 | .0015 | .025 |
| 10/9-10/16 | .036 | .032 | .034 | .032 | .0335 | .0019 | .036 |
| 10/16-10/23 | .019 | .026 | .028 | .022 | .0238 | .0040 | .027 |
| 10/23-10/30 | .015 | .025 | .029 | .029 | .0245 | .0066 | .025 |
| 10/30-11/6 | .032 | .029 | .034 | .030 | .0312 | .0022 | .029 |
| 11/6-11/13 | .035 | .037 | .036 | .042 | .0375 | .0031 | .038 |
| 11/13-11/20 | .032 | .032 | .031 | .035 | .0325 | .0017 | .027 |
| 11/20-11/27 | .024 | .021 | .024 | .025 | .0235 | .0017 | .022 |
| 11/27-12/4 | .028 | .025 | .025 | .032 | .0275 | .0033 | .024 |

TABLE 3 (cont'd)

1990 AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS RESULTS

($pCi/m^3$)

| | INDICATOR LOCATIONS | | | | INDICATOR | STANDARD | CONTROL |
|---|---|---|---|---|---|---|---|
| DATE | LOC 2 | LOC 3 | LOC 32 | LOC 37 | AVERAGE | DEVIATION | LOC 40 |
| 12/4-12/11 | .031 | .024 | .029 | .032 | .0290 | .0036 | .028 |
| 12/11-12/18 | .039 | .036 | .040 | .042 | .0393 | .0025 | .038 |
| 12/18-12/26 | .040 | .042 | .040 | .046 | .0420 | .0028 | .037 |
| 12/26-1/2 | .036 | .041 | .041 | .039 | .0393 | .0024 | .040 |

TABLE 4

AIR PARTICULATE COMPOSITE SAMPLES
GAMMA ANALYSIS RESULTS

($pCi/m^3$)

| ISOTOPE | QTR | LOC 2 | LOC 3 | LOC 32 | LOC 37 | (CNTRL) LOC 40 |
|---|---|---|---|---|---|---|
| Be-7 | 1st | .0587 | .0565 | .0582 | .0712 | .0449 |
| | 2nd | .0493 | .0414 | .0133 | .0168 | .0668 |
| | 3rd | .0624 | .0535 | .0647 | .0529 | .0607 |
| | 4th | .0552 | .0484 | .0489 | .0553 | .0530 |
| K-40 | 1st | .00883 | .0130 | ND | ND | ND |
| | 2nd | .00935 | ND | ND | .00795 | ND |
| | 3rd | ND | ND | ND | ND | ND |
| | 4th | ND | ND | .00753 | ND | ND |

ND - Not Detected

NO OTHER GAMMA EMITTERS DETECTED.

TABLE 5

1990 TLD RESULTS

(mR/Standard Quarter*)

| LOCATION | 1ST QUARTER AVG | 1ST QUARTER SDEV | 2ND QUARTER AVG | 2ND QUARTER SDEV | 3RD QUARTER AVG | 3RD QUARTER SDEV | 4TH QUARTER AVG | 4TH QUARTER SDEV |
|---|---|---|---|---|---|---|---|---|
| 1 | 18.0 | 0.6 | 15.3 | 0.4 | 15.6 | 0.3 | 16.4 | 0.1 |
| 2 | 14.9 | 0.2 | 13.6 | 0.7 | 13.9 | 0.2 | 15.4 | 0.6 |
| 3 | 16.1 | 0.3 | 14.7 | 0.2 | 15.2 | 0.4 | 15.2 | 0.8 |
| 4 | 18.0 | 0.3 | 15.3 | 0.3 | 17.0 | 0.8 | 15.4 | 0.8 |
| 5 | 15.4 | 0.3 | 14.9 | 0.2 | 14.8 | 0.5 | 15.1 | 0.4 |
| 6 | 15.7 | 0.3 | 14.4 | 0.3 | 14.4 | 0.4 | 13.8 | 0.7 |
| 7 | 15.3 | 0.3 | 13.8 | 0.3 | 14.0 | 0.6 | 14.5 | 0.7 |
| 8 | 17.4 | 0.4 | 14.5 | 0.8 | 16.0 | 0.5 | 17.2 | 1.2 |
| 9 | 17.1 | 0.6 | 14.7 | 0.5 | 14.1 | 0.3 | 16.6 | 1.0 |
| 10 | 17.9 | 0.3 | 15.7 | 0.3 | 15.7 | 0.2 | 16.4 | 0.3 |
| 11 | 19.2 | 1.0 | 17.1 | 0.4 | 17.4 | 0.9 | 18.3 | 0.8 |
| 12 | 17.8 | 0.5 | 15.3 | 0.3 | 15.4 | 0.4 | 16.4 | 0.5 |
| 13 | 17.5 | 0.3 | 15.7 | 0.4 | 15.9 | 0.3 | 16.7 | 0.5 |
| 14 | 17.2 | 0.5 | 15.8 | 0.2 | 15.9 | 0.4 | 16.4 | 0.4 |
| 15 | 16.7 | 0.3 | 15.5 | 0.3 | 16.8 | 0.5 | 15.4 | 0.4 |
| 16 | 16.9 | 0.6 | 16.1 | 0.6 | 17.6 | 0.2 | 14.9 | 2.8 |
| 17 | 16.7 | 0.9 | 15.1 | 0.3 | 14.2 | 1.0 | 15.1 | 1.2 |
| 18 | 17.9 | 0.7 | 16.5 | 0.5 | 16.7 | 0.5 | 16.7 | 3.2 |
| 19 | 20.1 | 1.0 | 16.2 | 0.4 | 17.0 | 0.4 | 14.3 | 0.9 |
| 20 | 17.5 | 0.5 | 15.4 | 0.2 | 15.2 | 0.7 | 15.8 | 0.7 |
| 21 | 15.1** | 0.1 | 13.5 | 0.4 | 14.0 | 0.4 | 13.1 | 1.3 |
| 22 | 17.3 | 0.6 | 14.8 | 0.2 | 15.5 | 0.3 | 14.1 | 1.2 |
| 23 | 17.3 | 0.2 | 14.9 | 0.3 | 15.5 | 0.3 | 14.7 | 0.9 |
| 24 | 16.6 | 0.3 | 15.3 | 0.3 | 18.8 | 1.0 | 15.4 | 0.9 |

* 90 days per Standard Quarter
** Based on the results of one TLD

TABLE 5 (cont'd)

1990 TLD RESULTS

(mR/Standard Quarter*)

| LOCATION | 1ST QUARTER AVG | 1ST QUARTER SDEV | 2ND QUARTER AVG | 2ND QUARTER SDEV | 3RD QUARTER AVG | 3RD QUARTER SDEV | 4TH QUARTER AVG | 4TH QUARTER SDEV |
|---|---|---|---|---|---|---|---|---|
| 25 | 15.3 | 1.2 | 12.0 | 0.3 | 13.7 | 1.1 | 11.8 | 0.9 |
| 26 | 15.6 | 0.5 | 13.8 | 0.4 | 14.3 | 0.3 | 13.7 | 1.1 |
| 27 | 17.5 | 0.5 | 15.3 | 0.6 | 16.2 | 0.2 | 15.6 | 0.4 |
| 28 | 15.7 | 0.2 | 14.9 | 0.2 | 13.6 | 0.5 | 13.0 | 0.5 |
| 29 | 14.1 | 0.2 | 13.3 | 0.5 | 13.8 | 0.4 | 13.2 | 0.3 |
| 30 | 15.6 | 0.3 | 14.6 | 0.3 | 15.2 | 0.2 | 13.6 | 1.2 |
| 31 | 15.9 | 0.9 | 14.6 | 0.4 | 14.9 | 1.0 | 15.1 | 0.5 |
| 32 | 14.9 | 0.4 | 13.6 | 0.6 | 14.4 | 0.5 | 14.9 | 0.3 |
| 33 | 17.9 | 0.2 | 15.8 | 0.3 | 17.2 | 0.2 | 16.0 | 0.6 |
| 34 | 17.6 | 0.5 | 14.6 | 0.9 | 16.3 | 0.4 | 14.9 | 1.8 |
| 35 | 17.5 | 0.4 | 16.4 | 0.2 | 15.7 | 0.6 | 15.6 | 0.3 |
| 36 | 16.1 | 0.4 | 14.9 | 0.4 | 16.5 | 0.3 | 15.8 | 0.6 |
| 37 | 16.1 | 0.1 | 13.6 | 0.3 | 14.8 | 0.1 | 15.2 | 0.8 |
| 38 | 17.3 | 1.0 | 17.0 | 0.5 | 17.4 | 0.3 | 16.1 | 0.6 |
| 39 | 15.9 | 0.3 | 15.3 | 0.7 | 15.8 | 0.3 | 15.6 | 0.5 |
| 40 | 15.5 | 0.7 | 12.8 | 0.2 | 12.8 | 0.5 | 14.2 | 0.4 |
| 41 | 16.9 | 0.3 | 11.6 | 1.4 | 15.3 | 0.3 | 16.4 | 0.6 |
| 42 | 10.8 | 0.7 | 10.1 | 0.2 | 10.0 | 0.2 | 11.1 | 0.5 |
| 43 | 9.9 | 0.2 | 8.9 | 0.3 | 9.0 | 0.2 | 9.7 | 0.4 |

* 90 days per Standard Quarter

TABLE 6

DRINKING WATER SAMPLES
GROSS BETA ANALYSIS RESULTS

(pCi/liter)

| MONTH | INDICATOR LW-40 | CONTROL BW-15 |
|---|---|---|
| JAN | 6.2 ± 1.2 | 7.1 ± 1.3 |
| FEB | 50 ± 3.0 | 8.3 ± 1.6 |
| MAR | 6.4 ± 1.3 | 6.5 ± 1.3 |
| APR | 5.6 ± 1.4 | 6.0 ± 1.4 |
| MAY | 5.4 ± 1.2 | 6.3 ± 1.2 |
| JUN | 7.2 ± 1.4 | 5.1 ± 1.2 |
| JUL | 4.8 ± 1.3 | 6.3 ± 1.4 |
| AUG | 4.8 ± 1.2 | 6.5 ± 1.3 |
| SEP | 4.0 ± 1.2 | 6.3 ± 1.3 |
| OCT | 7.2 ± 1.4 | 13 ± 7.0 |
| NOV | 7.3 ± 1.5 | 6.1 ± 1.3 |
| DEC | 6.2 ± 1.5 | 7.5 ± 1.4 |

TABLE 6A

DRINKING WATER SAMPLES
TRITIUM ANALYSIS RESULTS*

(pCi/liter)

| QUARTER | INDICATOR LW-40 | CONTROL BW-15 |
|---|---|---|
| 1st | < 200 | < 900 |
| 2nd | < 900 | < 900 |
| 3rd | 860 ± 340 | 1600 ± 400 |
| 4th | < 700 | < 700 |

* Detection Limit - 700-900 pCi/liter
  Reporting Level - 20000 pCi/liter

TABLE 7

SURFACE WATER SAMPLES
TRITIUM ANALYSIS RESULTS

(pCi/liter)

| DATE | DC (INDICATOR) | SP (INDICATOR) | SP(ALT) (INDICATOR) | MUSH (CONTROL) |
|---|---|---|---|---|
| 1/16/90 | 7000 ± 500 | 6800 ± 500 | N/A | < 500 |
| 2/20/90 | 7500 ± 700 | 8100 ± 700 | N/A | < 900 |
| 3/20/90 | 7900 ± 600 | 7700 ± 600 | N/A | < 800 |
| 4/17/90 | 7800 ± 600 | 7500 ± 600 | N/A | < 900 |
| 5/15/90 | 7400 ± 600 | 7100 ± 600 | N/A | < 800 |
| 6/19/90 | 6600 ± 600 | 7600 ± 600 | N/A | < 800 |
| 7/17/90 | 6200 ± 1400 | 6600 ± 1400 | N/A | < 900 |
| 8/21/90 | 5600 ± 500 | 5600 ± 500 | 5600 ± 500 | < 600 |
| 9/18/90 | 5800 ± 500 | 6200 ± 500 | 6100 ± 500 | < 600 |
| 10/16/90 | 5300 ± 600 | 5100 ± 600 | 5500 ± 600 | < 900 |
| 11/20/90 | 9000 ± 600 | 5600 ± 500 | 5900 ± 500 | < 600 |
| 12/18/90 | 5500 ± 500 | 5300 ± 500 | 5400 ± 500 | < 600 |

TABLE 8

BOTTOM SEDIMENT/SHORELINE SOIL
GAMMA ANALYSIS RESULTS

(pCi/gram - dry weight)

| DATE | SAMPLE TYPE | NUCLIDE | INDICATOR WCCL CONCENTRATION | CONTROL JRR CONCENTRATION |
|---|---|---|---|---|
| 4/17/90 | Shoreline Soil Discharge Cove | K-40 | 9.96 ± 1.00 | N/A |
| | | Co-60 | 0.177 ± 0.029 | N/A |
| | | Ra-226 | 1.58 ± 0.51 | N/A |
| | | Th-228 | 1.14 ± 0.11 | N/A |
| 6/26/90 | Bottom Sediment Discharge Cove | K-40 | 12.2 ± 1.2 | N/A |
| | | Co-58 | 0.0686 ± 0.0402 | N/A |
| | | Co-60 | 0.345 ± 0.054 | N/A |
| | | Cs-137 | 0.411 ± 0.047 | N/A |
| | | Ra-226 | 1.57 ± 0.55 | N/A |
| | | Th-228 | 1.32 ± 0.13 | N/A |
| 6/27/90 | Bottom Sediment Ultimate Heat Sink Canal | K-40 | 12.5 ± 1.3 | N/A |
| | | Co-60 | 0.082 ± 0.0266 | N/A |
| | | Cs-137 | 0.311 ± 0.031 | N/A |
| | | Ra-226 | 2.05 ± 0.36 | N/A |
| | | Th-228 | 1.11 ± 0.11 | N/A |
| 6/27/90 | Bottom Sediment Ultimate Heat Sink Dam Area | K-40 | 12.3 ± 1.2 | N/A |
| | | Co-60 | 0.0728 ± 0.0323 | N/A |
| | | Cs-137 | 0.555 ± 0.056 | N/A |
| | | Ra-226 | 2.66 ± 0.6 | N/A |
| | | Th-228 | 1.51 ± 0.15 | N/A |
| 9/25/90 | Bottom Sediment Discharge Cove | K-40 | 11.3 ± 1.1 | N/A |
| | | Co-60 | 0.253 ± 0.049 | N/A |
| | | Cs-137 | 0.280 ± 0.034 | N/A |
| | | Ra-226 | 1.37 ± 0.75 | N/A |
| | | Th-228 | 1.12 ± 0.11 | N/A |
| 10/1/90 | Bottom Sediment John Redmond Reservoir | K-40 | N/A | 4.7 ± 1.5 |
| | | Cs-137 | N/A | 0.188 ± 0.019 |
| | | Ra-226 | N/A | 1.82 ± 0.37 |
| | | Th-228 | N/A | 1.46 ± 0.15 |

TABLE 8

BOTTOM SEDIMENT/SHORELINE SOIL
GAMMA ANALYSIS RESULTS

(pCi/gram - dry weight)

| DATE | SAMPLE TYPE | NUCLIDE | INDICATOR WCCL CONCENTRATION | CONTROL JRR CONCENTRATION |
|---|---|---|---|---|
| 10/16/90 | Shoreline Soil Discharge Cove | K-40 | 10.5 ± 1.1 | N/A |
| | | Co-60 | 0.151 ± 0.027 | N/A |
| | | Cs-137 | 0.0958 ± 0.0282 | N/A |
| | | Ra-226 | 2.13 ± 0.47 | N/A |
| | | Th-228 | 1.13 ± 0.11 | N/A |
| 10/15/90 | Shoreline Soil John Redmond Reservoir | K-40 | N/A | 10.7 ± 1.1 |
| | | Ra-226 | N/A | 1.96 ± 0.73 |
| | | Th-228 | N/A | 1.40 ± 0.14 |

TABLE 9

AQUATIC VEGETATION FROM WCCL DISCHARGE COVE
GAMMA ANALYSIS RESULTS

(pCi/gram - wet weight)

| DATE | VEGETATION TYPE | NUCLIDE | CONCENTRATION |
|---|---|---|---|
| 6/26/90 | Algae | Be-7 | 1.13 ± 0.11 |
| | | K-40 | 1.85 ± 0.18 |
| | | Co-58 | 0.0444 ± 0.0083 |
| | | Co-60 | 0.0488 ± 0.0086 |
| | | Cs-137 | 0.0589 ± 0.008 |
| | | Ra-226 | 0.215 ± 0.125 |
| | | Th-228 | 0.119 ± 0.012 |
| 9/18/90 | Algae | Be-7 | 0.750 ± 0.088 |
| | | K-40 | 1.88 ± 0.19 |
| | | Mn-54 | 0.0121 ± 0.0053 |
| | | Co-58 | 0.0433 ± 0.0072 |
| | | Co-60 | 0.118 ± 0.012 |
| | | Cs-134 | 0.0416 ± 0.0071 |
| | | Cs-137 | 0.113 ± 0 011 |
| | | Ra-226 | 0.45 ± 0.119 |
| | | Th-228 | 0.201 ± 0.020 |

TABLE 10

RESULTS OF THE 1990 LAND USE CENSUS

| SECTOR | DIRECTION FROM PLANT | DISTANCE (MILES) TO NEAREST: RESIDENCE | MILK ANIMAL | GARDEN |
|---|---|---|---|---|
| A | N | 1.4* | 4.5* | 1.4 |
| B | NNE | 3.1* | 4.1* | 3.1* |
| C | NE | 1.9 | NONE* | 2.2* |
| D | ENE | 2.1 | 2.4* | 2.1 |
| E | E | 1.8 | NONE | 1.8 |
| F | ESE | 1.6 | 4.7* | 1.6 |
| G | SE | 1.6 | NONE* | 1.6* |
| H | SSE | 3.1 | NONE | 4.3* |
| J | S | 3.3 | NONE | 3.8* |
| K | SSW | 2.6 | NONE | 4.1* |
| L | SW | 2.1 | NONE | 3.1* |
| M | WSW | 1.6 | 1.6 | 2.4* |
| N | W | 2.1* | NONE | NONE* |
| P | WNW | 2.8* | NONE | 2.8* |
| Q | NW | 1.4 | NONE | 3.2* |
| R | NNW | 1.9 | NONE | 2.1 |

* Indicates a change from 1989 data.

TABLE 11

RESULTS OF EPA INTERLABORATORY COMPARISON TESTS

| COLLECTION DATE | MEDIA | NUCLIDE | EPA RESULTS(a) | TELEDYNE RESULTS(b) | |
|---|---|---|---|---|---|
| 10/31/90 | Water | Gr. Beta | 32.00 ± 5.00 | 30.33 ± 0.58 | |
| | | Cs-134 | 5.00 ± 5.00 | 5.33 ± 1.15 | |
| | | Cs-137 | 5.00 ± 5.00 | 7.00 ± 0.00 | |
| 1/26/90 | Water | Gr. Beta | 12.0 ± 5.0 | 12.33 ± 1.73 | |
| 2/9/90 | Water | Co-60 | 15.00 ± 5.00 | 15.00 ± 3.46 | |
| | | Zn-65 | 139.00 ± 14.00 | 131.33 ± 9.07 | |
| | | Ru-106 | 139.00 ± 14.00 | 113.67 ± 4.04 | (c) |
| | | Cs-134 | 18.00 ± 5.00 | 15.33 ± 2.31 | |
| | | Cs-137 | 18.00 ± 5.00 | 19.33 ± 3.21 | |
| | | Ba-133 | 74.00 ± 7.00 | 66.00 ± 3.46 | |
| 2/23/90 | Water | H-3 | 4976.00 ± 498.00 | 4900.00 ± 100.00 | |
| 3/30/90 | Air Filter | Gr. Beta | 31.0 ± 5.0 | 31.67 ± 0.58 | |
| | | Cs-137 | 10.0 ± 5.0 | 10.67 ± 1.15 | |
| 4/17/90 | Water | Gr. Beta | 52.0 ± 5.0 | 53.33 ± 1.53 | |
| | | Cs-134 | 15.0 ± 5.0 | 12.67 ± 1.53 | |
| | | Cs-137 | 15.0 ± 5.0 | 16.33 ± 1.15 | |
| 4/27/90 | Milk | I-131 | 99.0 ± 10.0 | 89.67 ± 3.21 | |
| | | Cs-137 | 24.0 ± 5.0 | 27.33 ± 2.52 | |
| | | K | 1550.0 ± 78.0 | 1483.33 ± 75.06 | |
| 5/11/90 | Water | Gr. Beta | 15.0 ± 5.0 | 17.00 ± 1.00 | |
| 6/8/90 | Water | Co-60 | 24.0 ± 5.0 | 25.33 ± 2.52 | |
| | | Zn-65 | 148.0 ± 15.0 | 148.67 ± 3.06 | |
| | | Ru-106 | 210.0 ± 21.0 | 196.00 ± 20.66 | |
| | | Cs-134 | 24.0 ± 5.0 | 23.67 ± 2.89 | |
| | | Cs-137 | 25.0 ± 5.0 | 24.67 ± 2.08 | |
| | | Ba-133 | 99.0 ± 10.0 | 93.00 ± 6.08 | |
| 6/22/90 | Water | H-3 | 2933.0 ± 358.0 | 2900 ± 100.00 | |
| 8/10/90 | Water | I-131 | 39.0 ± 6.0 | 36.00 ± 3.00 | |
| 8/31/90 | Water | Gr. Beta | 62.0 ± 5.0 | 63.33 ± 1.53 | |
| | | Cs-137 | 20.0 ± 5.0 | 18.33 ± 3.21 | |

Footnotes at end of table.

TABLE 11 (cont'd)

RESULTS OF EPA INTERLABORATORY COMPARISON TESTS

| COLLECTION DATE | MEDIA | NUCLIDE | EPA RESULTS(a) | TELEDYNE RESULTS(b) | |
|---|---|---|---|---|---|
| 9/21/90 | Water | Gr. Beta | 10.0 ± 5.0 | 11.00 ± 1.00 | |
| 9/28/90 | Milk | I-131 | 58.0 ± 6.0 | 54.67 ± 1.53 | |
| | | Cs-137 | 20.0 ± 5.0 | 23.00 ± 1.73 | |
| | | K | 1700 0 ± 85.0 | 1710.00 ± 65.51 | |
| 10/15/90 | Water | Co-60 | 20.0 ± 5.0 | 21.00 ± 1.00 | |
| | | Zn-65 | 115.0 ± 12.0 | 115.00 ± 11.53 | |
| | | Ru-106 | 151.0 ± 15.0 | 142.00 ± 8.66 | |
| | | Cs-134 | 12.0 ± 5.0 | 11.00 ± 0.00 | |
| | | Cs-137 | 12.0 ± 5.0 | 16.33 ± 2.52 | |
| | | Ba-133 | 110.0 ± 11.0 | 94.67 ± 5.13 | (d) |
| 10/19/90 | Water | H-3 | 7203.0 ± 720.0 | 7133.33 ± 251.66 | |
| 10/30/90 | Water | Gr. Beta | 53.0 + 5.0 | 51.00 + 2.31 | |
| | | Cs-134 | 7.0 + 5.0 | 9.00 + 0.00 | |
| | | Cs-137 | 5.0 + 5.0 | 7.67 + 1.15 | |

FOOTNOTES:

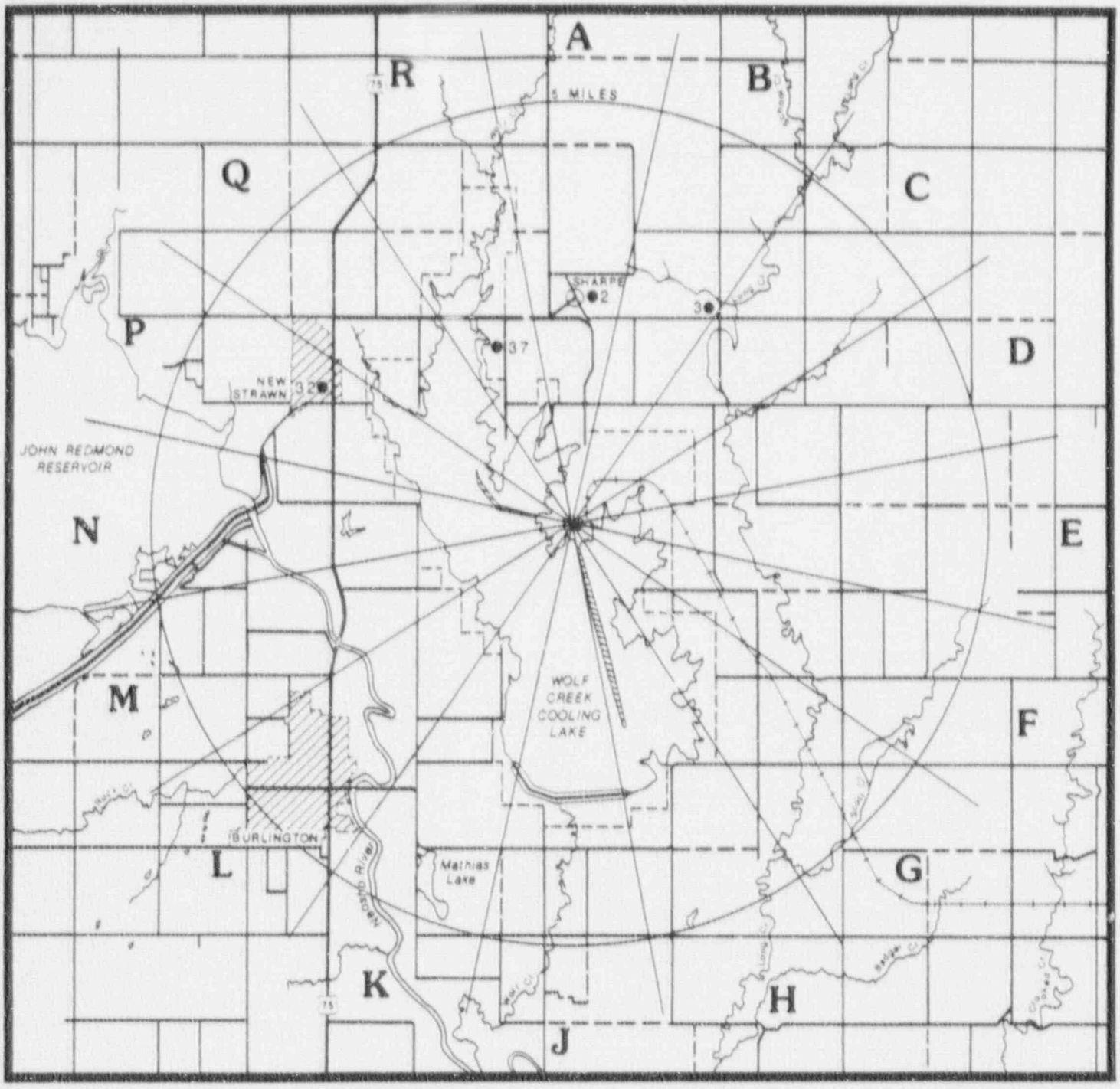
(a) EPA Results - Expected laboratory precision (1 sigma). Units are pCi/liter for water, and milk except K (total) is in mg/liter. Units are total pCi for air particulate filters.

(b) Teledyne Results - Average +/- one sigma. Units are pCi/liter for water and milk except K is in mg/liter. Units are total pCi for air particulate filters.

(c) No apparent cause for the low results were found. Three aliquots of the sample were counted on three separate detectors. The results of all three were similar. The calibration curve fit is good (0.997). Ruthenium-106 was obtained from the EPA. Results of spikes were acceptable. Subsequent cross-checks from the EPA did not exceed two normalized standard deviations. No additional follow-up is necessary, but Teledyne will continue to monitor the results. New calibrations were completed in March, 1991.

(d) There is no apparent reason for the deviation between the EPA and Teledyne Isotopes values. Other isotopes in the sample were measured accurately. The calculations were reviewed and activities calculated from other Ba-133 gamma rays. Results were reproduced as reported.

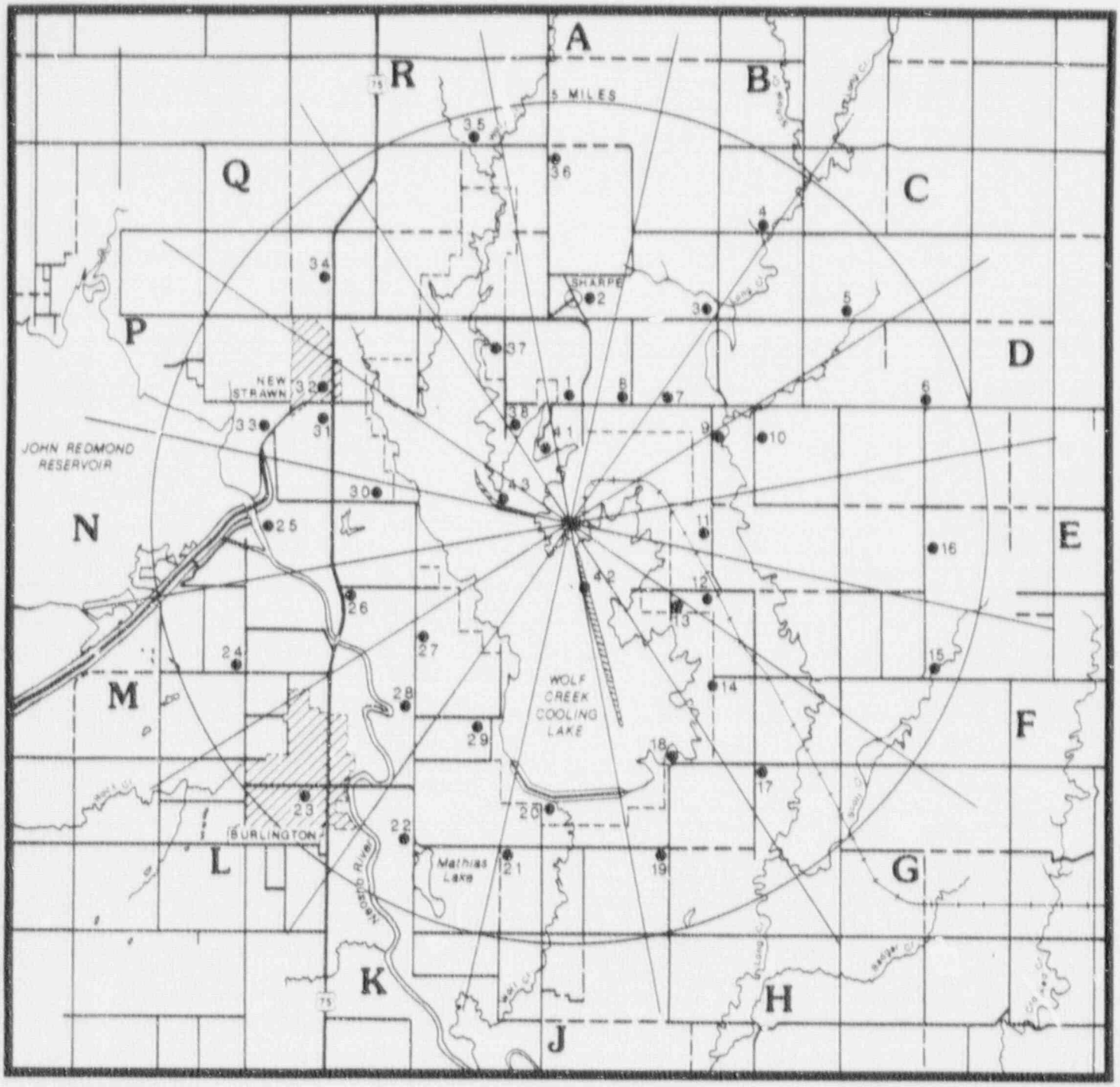
FIGURE 1




## AIRBORNE PATHWAY SAMPLING LOCATIONS

●-AIRBORNE PARTICULATE AND RADIOIODINE

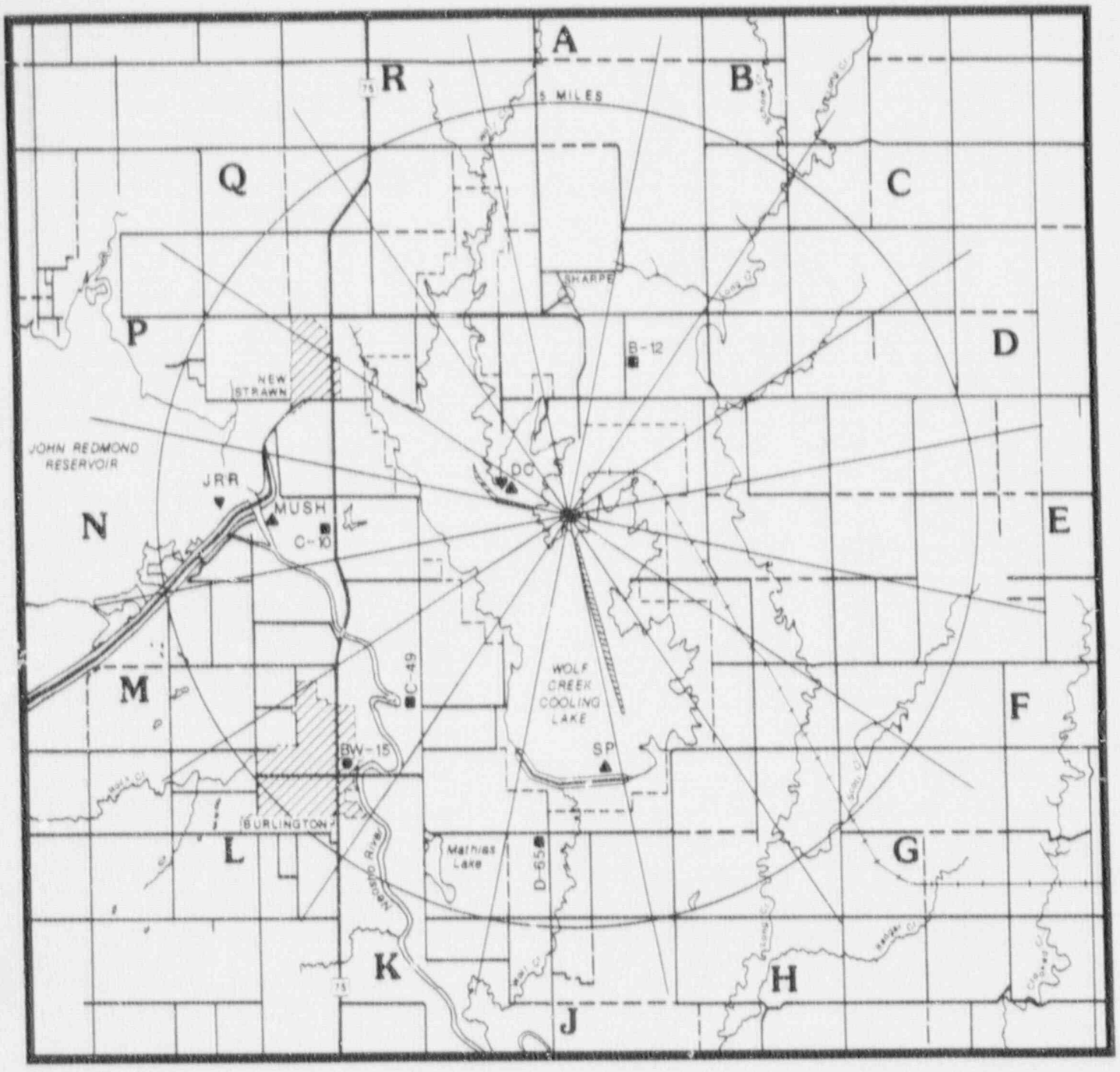
FIGURE 2




## DIRECT RADIATION PATHWAY SAMPLING LOCATIONS

●-TLD LOCATIONS

FIGURE 3



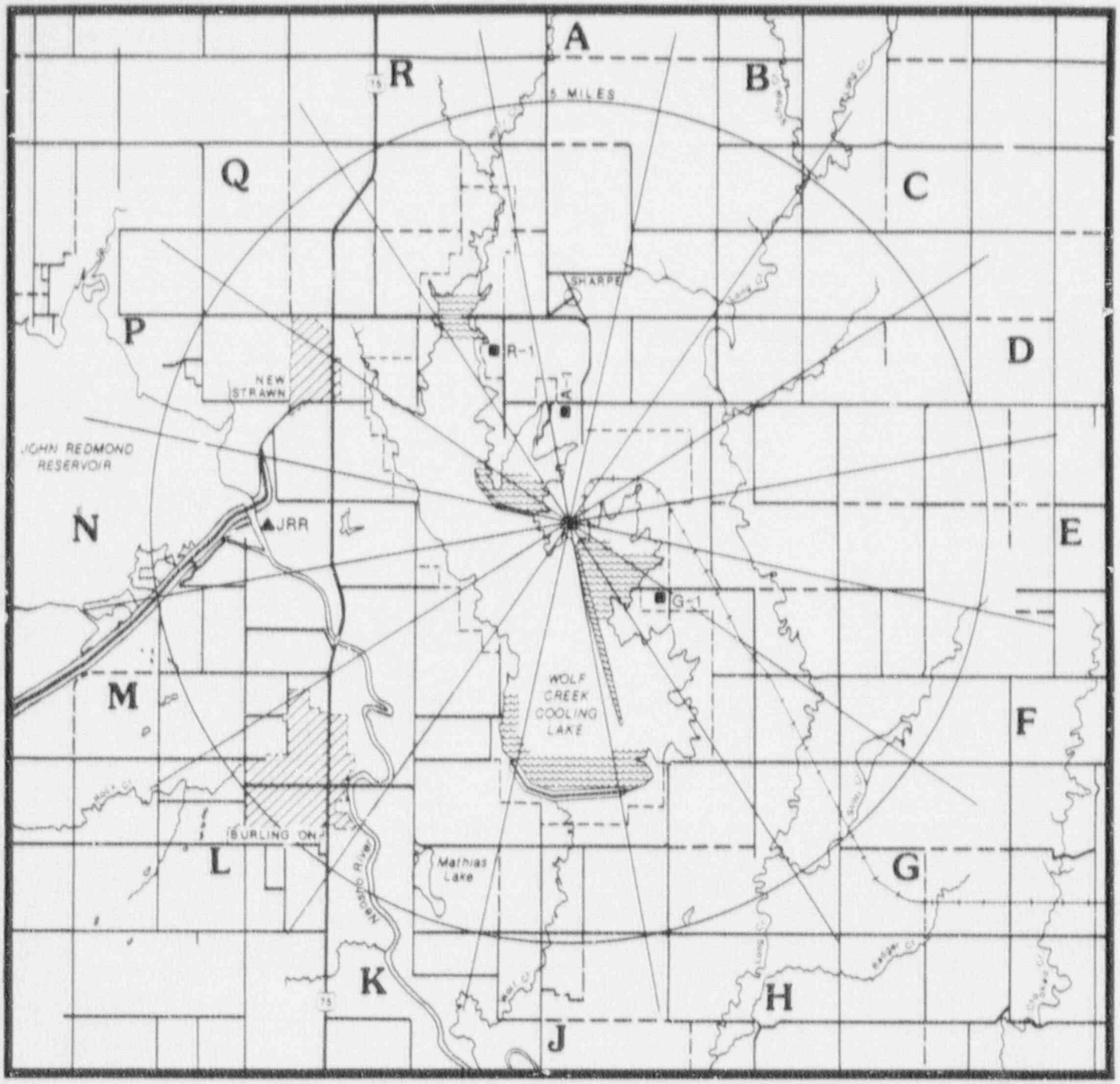

## WATERBORNE PATHWAY SAMPLING LOCATIONS

●-DRINKING WATER ▲-SURFACE WATER

■-GROUND WATER ▼-SHORELINE SEDIMENT

BOTTOM SEDIMENT

AQUATIC VEGETATION

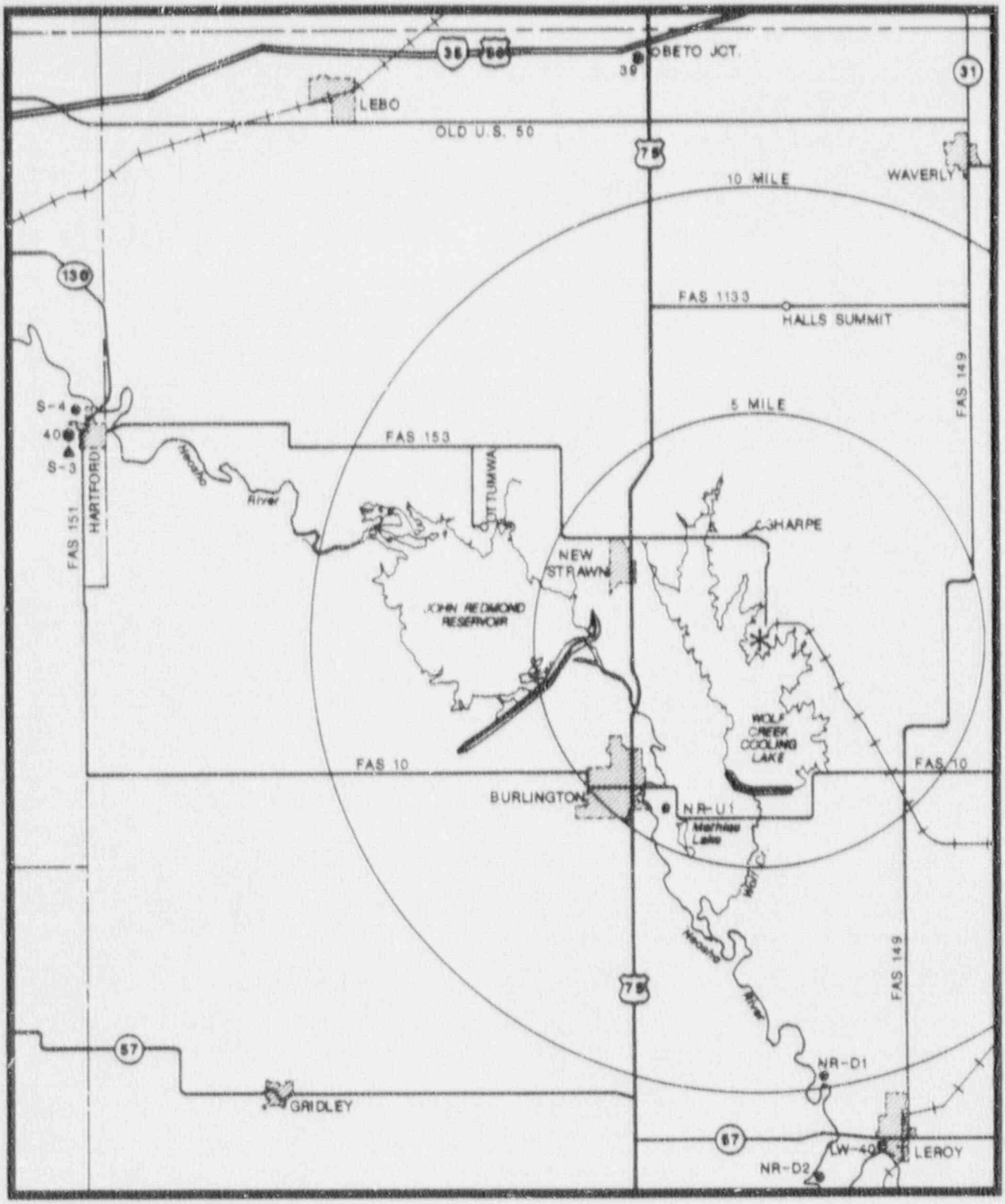



## INGESTION PATHWAY SAMPLING LOCATIONS

■-FOOD PRODUCTS

≋-FISH (WCCL) ▲-FISH (JRR)

FIGURE 5




## DISTANT SAMPLING LOCATIONS

●-TLD ■-DRINKING WATER

▲-MILK ●-BROADLEAF VEGETATION/ IRRIGATED CROPS

# 1990 AIRBORNE PARTICULATE ACTIVITY

## WEEKLY GROSS BETA ANALYSIS RESULTS

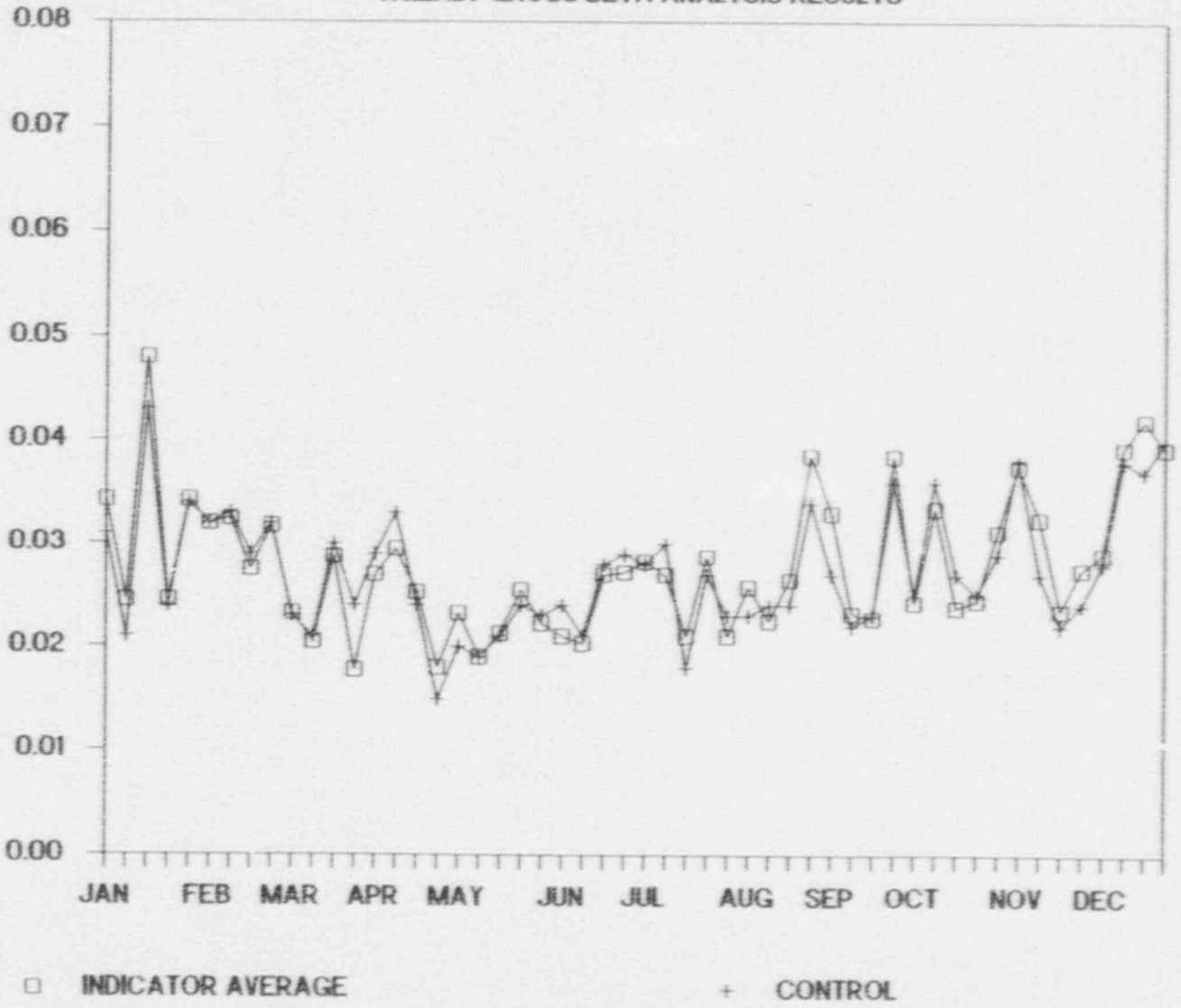
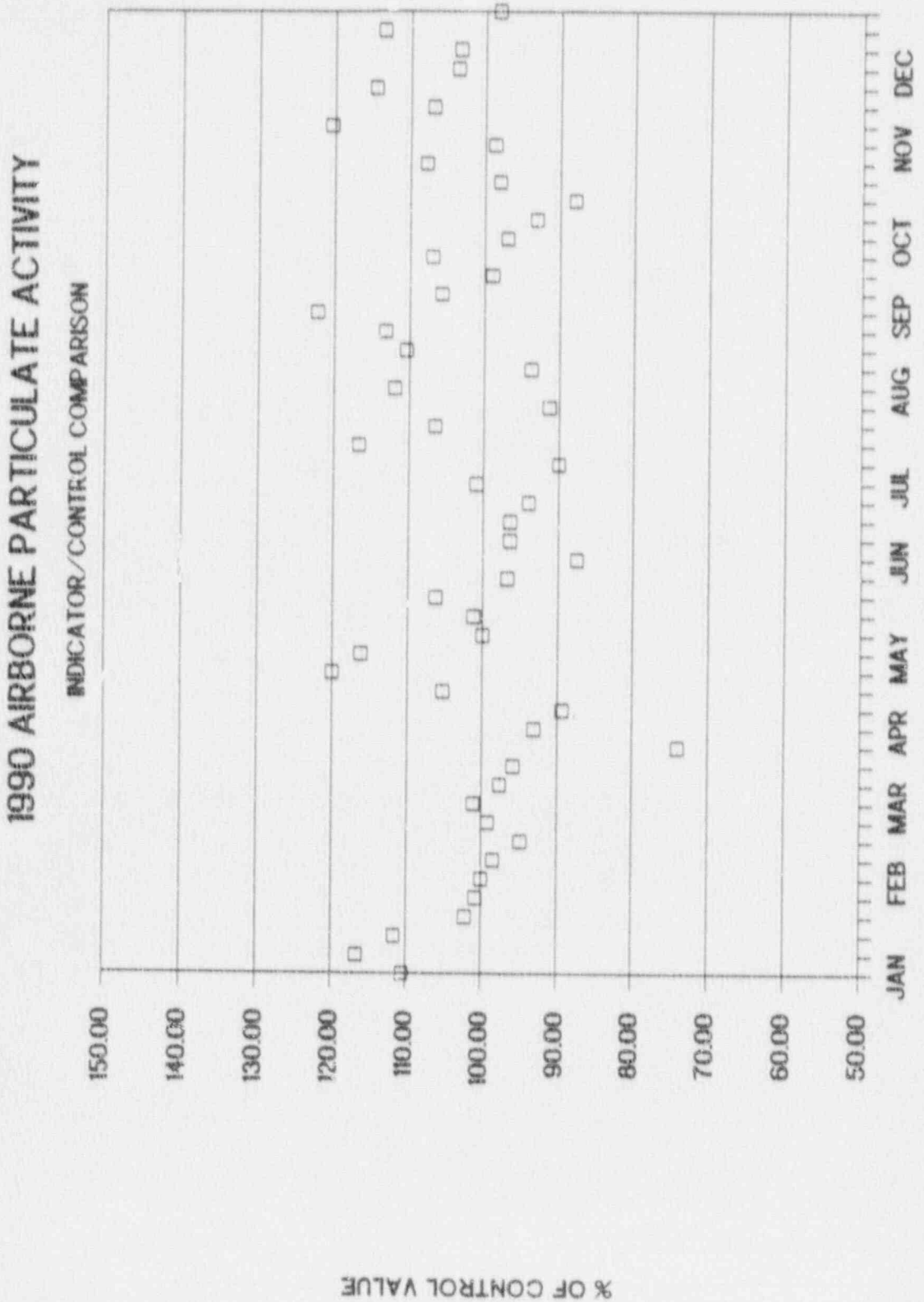



FIGURE 6

FIGURE 7


1990 AIRBORNE PARTICULATE ACTIVITY
INDICATOR/CONTROL COMPARISON
% OF CONTROL VALUE
150.00
140.00
130.00
120.00
110.00
100.00
90.00
80.00
70.00
60.00
50.00
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
IND/CONTROL (%)

# OPERATIONAL TLD RESULTS

(NEARSITE & CONTROL LOCATION AVERAGES)

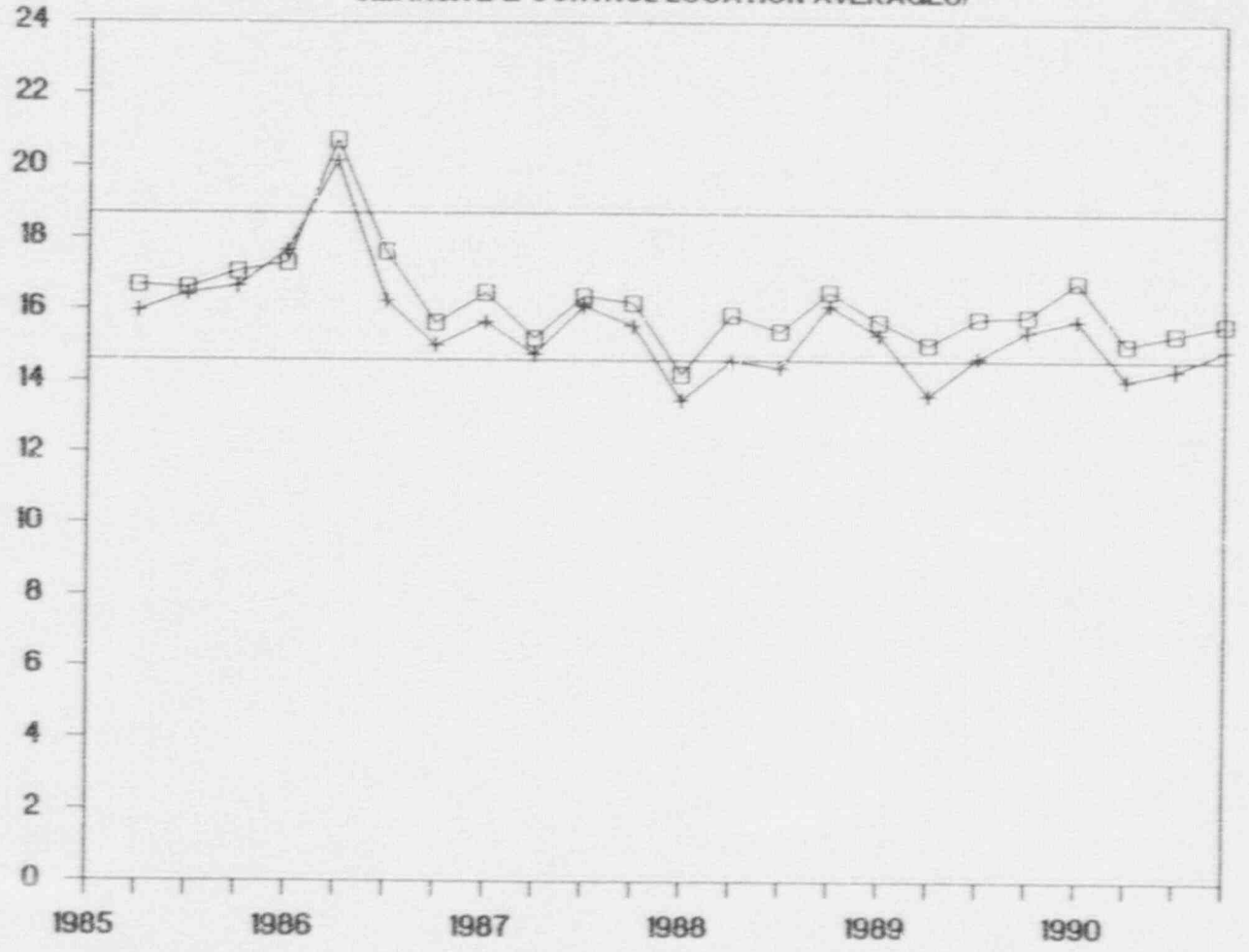
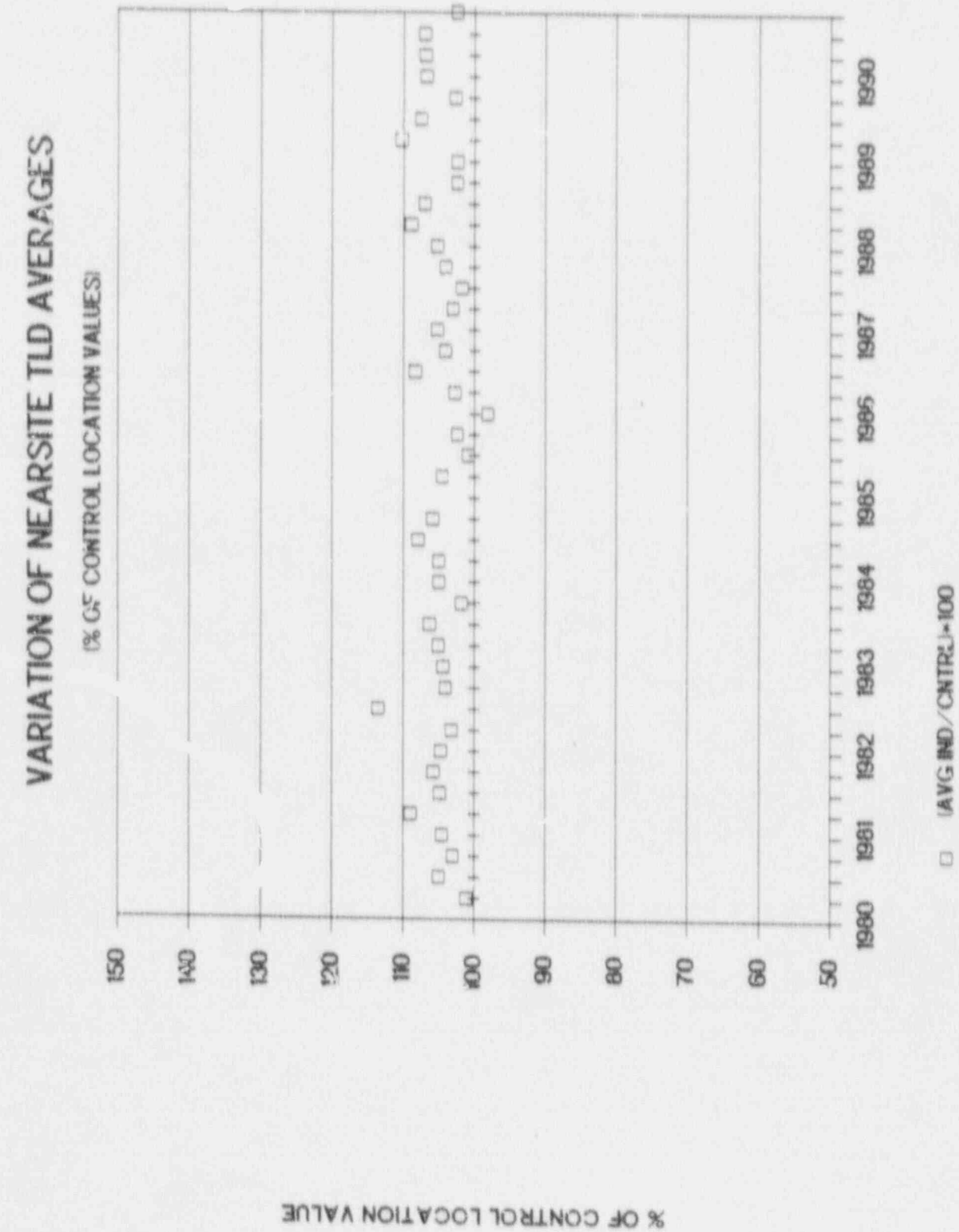



FIGURE 8

FIGURE 9


VARIATION OF NEARSITE TLD AVERAGES
(% OF CONTROL LOCATION VALUES)
150
140
130
120
110
100
90
80
70
60
50
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
(AVG IND/CNTRL)*100
% OF CONTROL LOCATION VALUE

# 1990 DRINKING WATER ANALYSIS

GROSS BETA

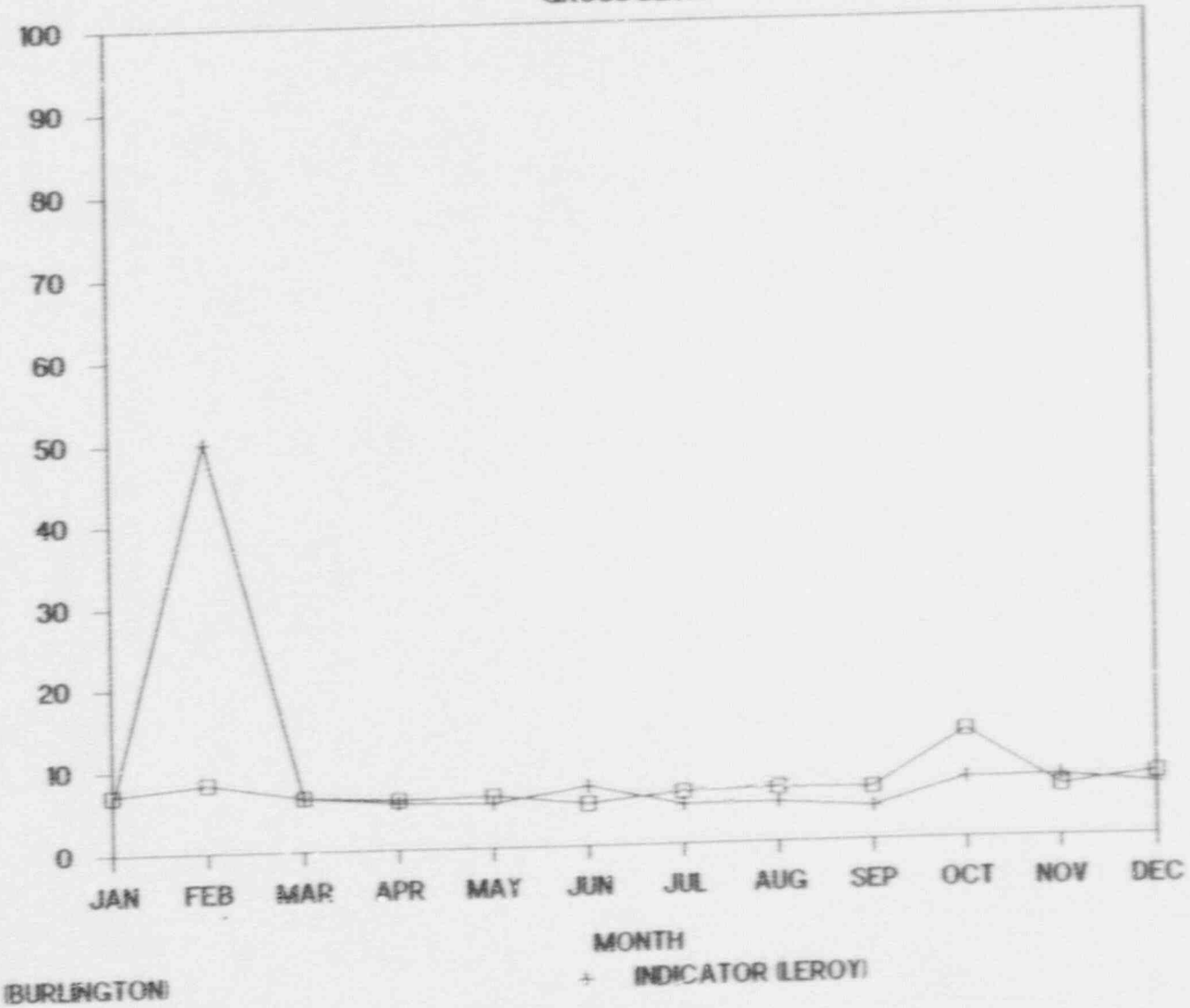
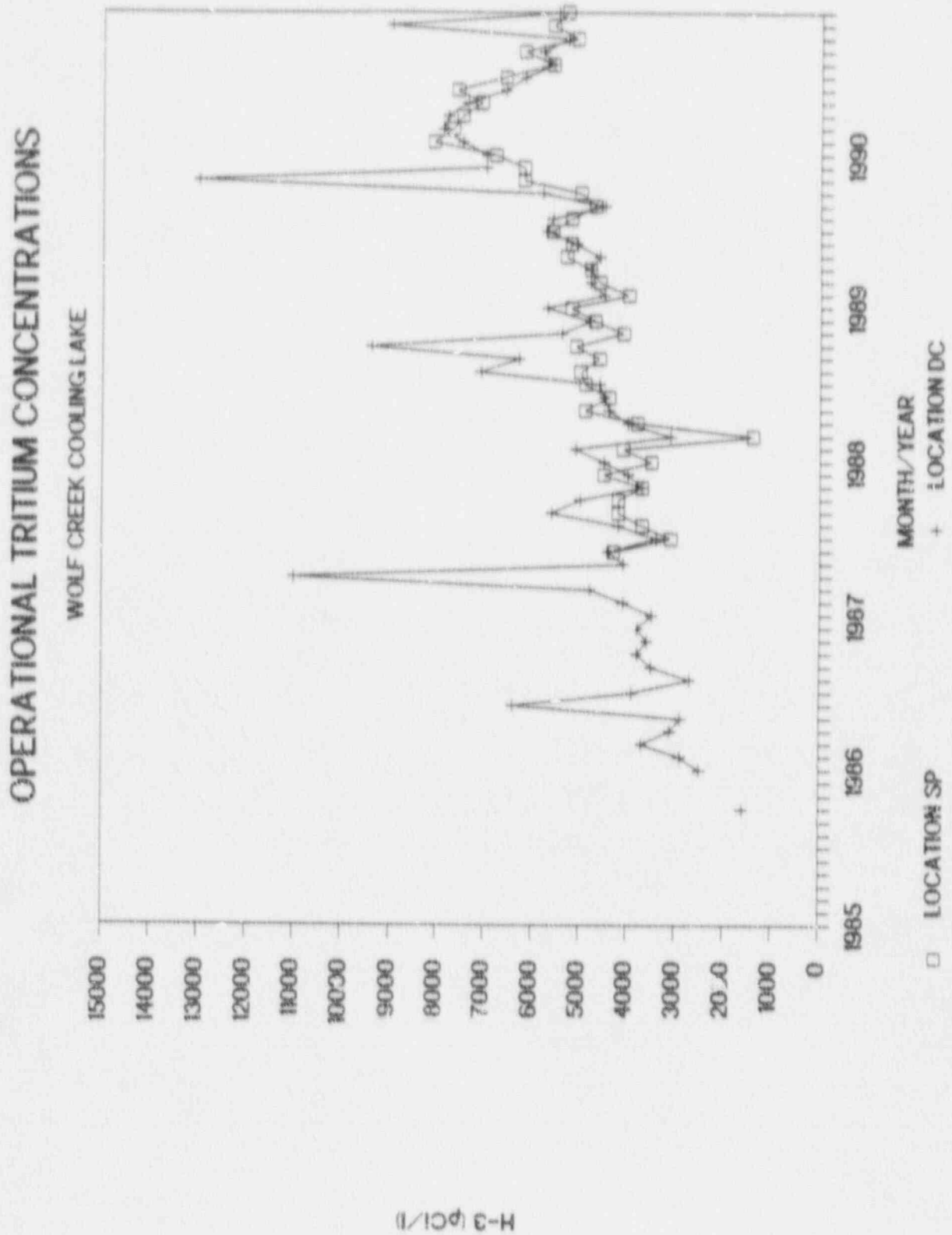



FIGURE 10

FIGURE 11


OPERATIONAL TRITIUM CONCENTRATIONS
WOLF CREEK COOLING LAKE
H-3 (pCi/l)
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
1985
1986
1987
1988
1989
1990
MONTH/YEAR
LOCATION SP
LOCATION DC

# Appendix A

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

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

Name of Facility Wolf Creek Nuclear Docket No.STN 50-482

Location of Facility Coffey County, Kansas Reporting Period Annual 1990
(County, State)

| Medium of Pathway Sampled (Unit of Measurement) | Analysis and Total Number of Analysis Performed | Lower Limit of Detection (LLD) | All Indicator Locations ** Mean (f) **Range | Location with Highest Annual Mean Name Distance and Directions | **Mean (f) **Range | Control Locations **Mean (f) **Range | Number of Nonroutine Reported Measurements** |
|---|---|---|---|---|---|---|---|
| | | | | | | Station No. 40 | |
| Air Particulate (X10$^{-3}$ pCi/Cu.M.) | Gross (260) Beta | 3 | 28(208/208) (10-50) | 37 2.1 miles NNW | 29(52/52) (10-50) | 27(52/52) (15-43) | 0 |
| | I-131 (260) | 7 | -(0/208) | N/A | N/A | -(0/52) | - |
| | Gamma (20) | | | | | | |
| | Be-7 | 1 | 50(16/16) (13-71) | 40 >15 miles WNW | 56(4/4) (45-67) | 56(4/4) (45-67) | 0 |
| | K-40 | 24 | 9.3(5/16) (7.5-13) | 03 3.0 miles NNE | 13(1/4) -- | -(0/4) -- | 0 |
| | | | | | | Stations 39 and 40 | |
| External Radiation (mR/day) | TLD (318) Quarterly | 0.05 | 0.18(302/302) (0.13-0.25) | 11 1.6 miles E | 0.20(8/8) (0.19-0.21) | 0.16(16/16) (0.14-0.18)[ | 0 |

* Nominal Lower Limit of Detection (LLD)

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

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

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| Medium of Pathway Sampled (Unit of Measurement) | Analysis and Total Number of Analysis Performed | Lower Limit of Detection (LLD)* | All Indicator Locations ** Mean (f) **Range | Location with Highest Annual Mean Name Distance and Directions | **Mean (f) **Range | Control Locations **Mean (f) **Range | Number of Nonroutine Reported Measurements** |
|---|---|---|---|---|---|---|---|
| | | | | | | J. Redmond Reservoir | |
| Fish (pCi/g wet) | Gamma (12) | | | | | | |
| | K-40 | 0.5 | 4.0(7/7) (2.9-5.2) | JRR 4.0 miles W | 4.8(5/5) (3.7-5.9) | 4.8(5/5) (3.7-5.9) | 0 |
| | CS-137 | | 0.040(1/7) -- | WOCL | 0.040(1/7) -- | (0/5) -- | 0 |
| | | | | | | S-4 | |
| Food and Garden Crops (pCi/g wet weight) | Gamma (17) | | | | | | |
| | Be-7 | 0.09 | 0.37(10/13) (0.25-0.55) | S-4 >15.0 miles WNW | 0.53(4/4) (0.39-0.77) | 0.53(4/4) (0.39-0.77) | 0 |
| | K-40 | 0.5 | 4.0(13/13) (2.0-6.3) | R-1 2.1 miles NNW | 4.7(4/4) (3.2-6.3) | 3.8(4/4) (2.9-4.6) | 0 |
| | Cs-137 | 0.08 | 0.018(1/13) -- | S-4 -- | 0.032(1/4) -- | 0.032(1/4) -- | 0 |
| | Ra-226 | | (0/13) -- | S-4 -- | 0.40(1/4) -- | 0.40(1/4) -- | 0 |
| | Th-228 | | (0/13) -- | S-4 -- | 0.11(1/4) -- | 0.11(1/4) -- | 0 |
| | | | | | | NRU1 | |
| Irrigated Crop (pCi/g dry weight) | Gamma (2) | | | | | | |
| | K-40 | 0.5 | 3.5(1/1) -- | NRD2 > 10 miles S | 3.5(1/1) -- | 2.6(1/1) -- | 0 |

* Nominal Lower Limit of Detection (LLD)

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

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

Name of Facility Wolf Creek Nuclear Docket No.STN 50-482

Location of Facility Coffey County, Kansas Reporting Period Annual 1990
(County, State)

| Medium of Pathway Sampled (Unit of Measurement) | Analysis and Total Number of Analysis Performed | Lower Limit of Detection (LLD) | All Indicator Locations ** Mean (f) **Range | Location with Highest Annual Mean Name Distance and Directions | **Mean (f) **Range | Control Locations **Mean (f) **Range | Number of Nonroutine Reported Measurements** |
|---|---|---|---|---|---|---|---|
| | | | | | | Station S-3 | |
| Milk (pCi/l) | I-131 (20) | 3 | -- | -- | | -(0/20) | 0 |
| | Gamma (20) | | | | | | |
| | K-40 | 100 | -- | -- | | 1263(20/20 (917-1410) | 0 |

* Nominal Lower Limit of Detection (LLD)

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

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

Name of Facility Wolf Creek Nuclear Docket No.STN 50-482

Location of Facility Coffey County, Kansas (County, State) Reporting Period Annual 1990

| Medium of Pathway Sampled (Unit of Measurement) | Analysis and Total Number of Analysis Performed | Lower Limit of Detection (LLD)* | All Indicator Locations ** Mean (f) **Range | Location with Highest Annual Mean Name Distance and Directions | **Mean (f) **Range | Control Locations **Mean (f) **Range | Number of Nonroutine Reported Measurements** |
|---|---|---|---|---|---|---|---|
| | | | | | | Station No. JRR | |
| Sediment/Silt (pCi/g dry weight)) | Gamma (5) | | | | | | |
| | K-40 | 0.5 | 12(4/4) (11-13) | JRR | 15(1/1) -- | 15(1/1) -- | 0 |
| | Co-58 | 0.02 | 0.069(1/4) -- | DC 0.6 mile WNW | 0.069(1/2) -- | -(0/1) -- | 0 |
| | Co-60 | 0.02 | 0.19(4/4) (0.073-0.35) | DC 0.6 mile WNW | 0.30(2/2) (0.25-0.35) | -(0/1) -- | 0 |
| | Cs-137 | 0.06 | 0.39(4/4) (0.28-0.56) | UHSD | 0.56(1/1) -- | 0.19(1/1) -- | 0 |
| | Ra-226 | 0.5 | 1.9(4/4) (1.4-2.7) | UHSD | 2.7(1/1) -- | 1.8(1/1) -- | 0 |
| | Th-228 | 0.04 | 1.3(4/4) (1.1-1.5) | UHSD | 1.5(1/1) -- | 1.5(1/1) -- | 0 |

* Nominal Lower Limit of Detection (LLD)

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

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

Name of Facility Wolf Creek Nuclear Docket No.STN 50-482

Location of Facility Coffey County, Kansas Reporting Period Annual 1990
(County, State)

| Medium of Pathway Sampled (Unit of Measurement) | Analysis and Total Number of Analysis Performed | Lower Limit of Detection (LLD)* | All indicator Locations ** Mean (f) **Range | Location with Highest Name Distance and Directions | Annual Mean **Mean (f) **Range | Control Locations **Mean (f) **Range | Number of Nonroutine Reported Measurements** |
|---|---|---|---|---|---|---|---|
| | | | | | | Station No. JRR | |
| Shoreline Soil (pCi/g dry weight)) | Gamma (3) | | | | | | |
| | K-40 | 0.5 | 10(2/2) (10-11) | JRR 4.0 miles W | 11(1/1) -- | 11(1/1) -- | 0 |
| | Co-60 | | 0.16(2/2) (0.15-0.18) | DC 0.6 miles WNW | 0.16(2/2) (0.15-0.18) | -(0/1) -- | 0 |
| | Cs-137 | 0.06 | 0.096(1/2) -- | DC 0.6 miles WNW | 0.096(1/2) -- | -(0/1) -- | 0 |
| | Ra-226 | 0.5 | 1.9(2/2) (1.6-2.1) | JRR 4.0 miles W | 2.0(1/1) -- | 2.0(1/1) -- | 0 |
| | Th-228 | 0.04 | 1.1(2/2) (1.13-1.14) | JRR 4.0 miles W | 1.4(1/1) -- | 1.4(1/1) -- | 0 |

* Nominal Lower Limit of Detection (LLD)

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

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

Name of Facility Wolf Creek Nuclear Docket No.STN 50-482

Location of Facility Coffey County, Kansas Reporting Period Annual 1990
(County, State)

| Medium of Pathway Sampled (Unit of Measurement) | Analysis and Total Number of Analysis Performed | Lower Limit of Detection (LLD) | All Indicator Locations ** Mean (f) **Range | Location with Highest Annual Mean Name Distance and Directions | **Mean (f) **Range | Control Locations **Mean (f) **Range | Number of Nonroutine Reported Measurements** |
|---|---|---|---|---|---|---|---|
| | | | | | | No Control | |
| Vegetation Aquatic (pCi/g wet weight)) | Gamma (2) | | | | | | |
| | Be-7 | 0.1 | 0.94(2/2) (0.75-1.1) | DC 0.6 miles WNW | 0.94(2/2) (0.75-1.1) | -- | 0 |
| | K-40 | 0.5 | 1.9(2/2) (1.85-1.88) | DC 0.6 miles WNW | 1.9(2/2) (1.85-1.88) | -- | 0 |
| | Mn-54 | | 0.012(1/2) -- | DC 0.6 miles WNW | 0.012(1/2) -- | -- | 0 |
| | Co-58 | 0.01 | 0.044(2/2) (0.043-0.044) | DC 0.6 miles WNW | 0.044(2/2) (0.043-0.044) | -- | 0 |
| | Co-60 | 0.01 | 0.083(2/2) (0.049-0.12) | DC 0.6 miles WNW | 0.083(2/2) (0.049-0.12) | -- | 0 |
| | Cs-134 | | 0.042(1/2) -- | DC 0.6 miles WNW | 0.042(1/2) -- | -- | 0 |
| | Cs-137 | 0.01 | 0.086(2/2) (0.059-0.11) | DC 0.6 miles WNW | 0.086(2/2) (0.059-0.11) | -- | 0 |
| | Ra-226 | 0.2 | 0.33(2/2) (0.22-0.45) | DC 0.6 miles WNW | 0.33(2/2) (0.22-0.45) | -- | 0 |
| | Th-228 | 0.02 | 0.16(2/2) (0.12-0.20) | DC 0.6 miles WNW | 0.16(2/2) (0.12-0.20) | -- | 0 |

* Nominal Lower Limit of Detection (LLD)

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

## ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

Name of Facility Wolf Creek Nuclear Docket No.STN 50-482

Location of Facility Coffey County, Kansas Reporting Period Annual 1990
(County, State)

| Medium of Pathway Sampled (Unit of Measurement) | Analysis and Total Number of Analysis Performed | Lower Limit of Detection (LLD) | All Indicator Locations ** Mean (f) **Range | Location with Highest Annual Mean Name Distance and Directions | **Mean (f) **Range | Control Locations **Mean (f) **Range | Number of Nonroutine Reported Measurements** |
|---|---|---|---|---|---|---|---|
| | | | | | | BW-18 | |
| Water Drinking (pCi/l) | I-131 (24) | 0.5 | -(0/12) | NA | NA | -(0/12) | 0 |
| | Gross (24) Beta | 2 | 9.6(12/12) (4.0-50) | LW40 11.3 miles SSE | 9.6(12/12) (4.0-50) | 7.1(12/12) (5.1-13) | 0 |
| | Gamma (24) | -- | -(0/12) | NA | NA | -(0/12) | 0 |
| | Tritium (8) | 1000 | 860(1/4) -- | BW15 3.9 miles SW | 1600(1/4) -- | 1600(1/4) -- | 0 |
| | | | | | | B-12 | |
| Water, Ground (pCi/l) | I-131 (16) | 0.5 | -(0/12) -- | NA | NA | -(0/4) -- | 0 |
| | Gamma (16) | -- | -(0/12) -- | NA | NA | -(0/4) -- | 0 |
| | Tritium (16) | 1000 | -(0/12) -- | NA | NA | -(0/4) -- | 0 |

* Nominal Lower Limit of Detection (LLD)

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

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

Name of Facility Wolf Creek Nuclear Docket No.STN 50-482

Location of Facility Coffey County, Kansas Reporting Period Annual 1990
(County, State)

| Medium of Pathway Sampled (Unit of Measurement) | Analysis and Total Number of Analysis Performed* | Lower Limit of Detection (LLD) | All Indicator Locations ** Mean (f) **Range | Location with Highest Annual Mean Name Distance and Directions | **Mean (f) **Range | Control Locations **Mean (f) **Range | Number of Nonroutine Reported Measurements** |
|---|---|---|---|---|---|---|---|
| Water Surface (pCi/l) | Gamma (41) | | (0/29) -- | NA | NA | (0/12) -- | 0 |
| | Tritium (41) | 1000 | 6500(29/29) (5100-9000) | DC 0.6 miles WNW | 6800(12/12) (5300-9000) | (0/12) -- | 0 |

* Nominal Lower Limit of Detection (LLD)

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

# Appendix B

## Individual Sample Results

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 02

| COLLECTION START DATE | DATE STOP DATE | VOLUME | UNITS | MID-COUNT TIME DATE | A P FILTER GROSS BETA (PCI/CU.M.) | MID-COUNT TIME DATE | CHARCOAL FILTER I-131 (PCI/CU.M.) |
|---|---|---|---|---|---|---|---|
| 01/02 | 01/09 | 3.15E 08 | CC | 01/19 | 3.3 +-0.3 E-02 | 01/13 | L.T. 2. E-02 |
| 01/09 | 01/16 | 2.97E 0[illegible] | [illegible] | [illegible]29 | 2.4 +-0.3 E-02 | 01/21 | L.T. 2. E-02 |
| 01/16 | 01/23 | 2.89E 08 | CC | [illegible]5 | 5.0 +-0.4 E-02 | 01/27 | L.T. 3. E-02 |
| 01/23 | 01/30 | 3.07E 08 | CC | 02/20 | 2.6 +-0.3 E-02 | 02/04 | L.T. 3. E-02 |
| 01/30 | 02/06 | 2.97E 08 | CC | 02/16 | 3.5 +-0.3 E-02 | 02/10 | L.T. 2. E-02 |
| 02/06 | 02/13 | 3.02E 08 | CC | 02/27 | 3.2 +-0.3 E-02 | 02/17 | L.T. 2. E-02 |
| 02/13 | 02/20 | 3.02E 08 | CC | 03/02 | 3.3 +-0.3 E-02 | 02/24 | L.T. 2. E-02 |
| 02/20 | 02/27 | 2.95E 08 | CC | 03/08 | 2.6 +-0.3 E-02 | 03/03 | L.T. 2. E-02 |
| 02/27 | 03/06 | 2.92E 08 | CC | 03/16 | 3.3 +-0.3 E-02 | 03/10 | L.T. 2. E-02 |
| 03/06 | 03/13 | 2.93E 08 | CC | 03/23 | 2.3 +-0.3 E-02 | 03/16 | L.T. 2. E-02 |
| 03/13 | 03/20 | 3.05E 08 | CC | 03/30 | 2.1 +-0.3 E-02 | 03/24 | L.T. 2. E-02 |
| 03/20 | 03/27 | 3.01E 08 | CC | 04/07 | 2.5 +-0.3 E-02 | 03/29 | L.T. 2. E-02 |
| 03/27 | 04/03 | 3.00E 08 | CC | 04/19 | 1.5 +-0.2 E-02 | 04/07 | L.T. 2. E-02 |
| 04/03 | 04/10 | 3.00E 08 | CC | 04/24 | 2.7 +-0.3 E-02 | 04/12 | L.T. 2. E-02 |
| 04/10 | 04/17 | 3.35E 08 | CC | 04/28 | 2.7 +-0.3 E-02 | 04/21 | L.T. 2. E-02 |
| 04/17 | 04/24 | 3.18E 08 | CC | 05/04 | 2.6 +-0.3 E-02 | 04/26 | L.T. 2. E-02 |
| 04/24 | 05/01 | 3.31E 08 | CC | 05/14 | 1.8 +-0.3 E-02 | 05/04 | L.T. 2. E-02 |
| 05/01 | 05/08 | 3.26E 08 | CC | 05/18 | 2.3 +-0.3 E-02 | 05/11 | L.T. 2. E-02 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 02

| COLLECTION START DATE | DATE STOP DATE | VOLUME | UNITS | MID-COUNT TIME DATE | A P FILTER GROSS BETA (PCI/CU.M.) | MID-COUNT TIME DATE | CHARCOAL FILTER I-131 (PCI/CU.M.) |
|---|---|---|---|---|---|---|---|
| (A)05/01 | 05/08 | 3.[illegible]E 08 | CC | 05/18 | 1.3 +-0.2 E-02 | 05/12 | L.T. 2. E-02 |
| 05/08 | 05/15 | 3.11E 08 | CC | 05/26 | 1.9 +-0.3 E-02 | 05/19 | L.T. 2. E-02 |
| 05/15 | 05/22 | 3.32E 08 | CC | 06/01 | 1.9 +-0.3 E-02 | 05/26 | L.T. 2. E-02 |
| 05/22 | 05/29 | 3.02E 08 | CC | 06/11 | 2.7 +-0.3 E-02 | 06/01 | L.T. 2. E-02 |
| 05/29 | 06/05 | 3.02E 08 | CC | 06/15 | 2.2 +-0.3 E-02 | 06/07 | L.T. 2. E-02 |
| 06/05 | 06/12 | 3.16E 08 | CC | 06/22 | 2.1 +-0.3 E-02 | 06/15 | L.T. 2. E-02 |
| 06/12 | 06/19 | 3.19E 08 | CC | 06/27 | 1.9 +-0.3 E-02 | 06/22 | L.T. 2. E-02 |
| 06/19 | 06/26 | 3.05E 08 | CC | 07/06 | 2.6 +-0.3 E-02 | 06/30 | L.T. 2. E-02 |
| 06/26 | 07/03 | 3.04E 08 | CC | 07/13 | 2.4 +-0.3 E-02 | 07/06 | L.T. 2. E-02 |
| 07/03 | 07/10 | 3.15E 08 | CC | 07/24 | 2.6 +-0.3 E-02 | 07/12 | L.T. 2. E-02 |
| 07/10 | 07/17 | 3.09E 08 | CC | 07/26 | 2.5 +-0.3 E-02 | 07/21 | L.T. 2. E-02 |
| 07/17 | 07/24 | 3.19E 08 | CC | 08/03 | 2.1 +-0.3 E-02 | 07/28 | L.T. 2. E-02 |
| 07/24 | 07/31 | 3.02E 08 | CC | 08/10 | 2.6 +-0.3 E-02 | 08/02 | L.T. 2. E-02 |
| 07/31 | 08/07 | 3.07E 08 | CC | 08/21 | 1.9 +-0.3 E-02 | 08/10 | L.T. 2. E-02 |
| (A)07/31 | 08/07 | 3.07E 08 | CC | 08/21 | 2.4 +-0.3 E-02 | 08/14 | L.T. 3. E-02 |
| 08/07 | 08/14 | 3.10E 08 | CC | 08/27 | 2.8 +-0.3 E-02 | 08/17 | L.T. 2. E-02 |
| 08/14 | 08/21 | 3.00E 08 | CC | 08/30 | 2.4 +-0.3 E-02 | 08/26 | L.T. 2. E-02 |
| 08/21 | 08/28 | 3.05E 08 | CC | 09/14 | 2.6 +-0.3 E-02 | 08/30 | L.T. 2. E-02 |

(A) DUPLICATE ANALYSIS

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 02

| COLLECTION START DATE | DATE STOP DATE | VOLUME | UNITS | MID-COUNT TIME DATE | A P FILTER GROSS BETA (PCI/CU.M.) | MID-COUNT TIME DATE | CHARCOAL FILTER I-131 (PCI/CU.M.) |
|---|---|---|---|---|---|---|---|
| 09/28 | 09/04 | 3.01E 08 | CC | 09/13 | 3.8 +-0.4 E-02 | 09/06 | L.T. 2. E-02 |
| 09/04 | 09/11 | 3.00E 08 | CC | 09/21 | 3.7 +-0.4 E-02 | 09/14 | L.T. 2. E-02 |
| 09/11 | 09/18 | 3.00E 08 | CC | 09/27 | 2.5 +-0.3 E-02 | 09/22 | L.T. 2. E-02 |
| 09/18 | 09/25 | 3.11E 08 | CC | 10/01 | 2.0 +-0.3 E-02 | 09/28 | L.T. 2. E-02 |
| 09/25 | 10/02 | 3.23E 08 | CC | 10/12 | 3.5 +-0.3 E-02 | 10/06 | L.T. 2. E-02 |
| 10/02 | 10/09 | 3.09E 08 | CC | 10/18 | 2.3 +-0.3 E-02 | 10/13 | L.T. 2. E-02 |
| 10/09 | 10/16 | 3.27E 08 | CC | 10/24 | 3.6 +-0.3 E-02 | 10/18 | L.T. 2. E-02 |
| 10/16 | 10/23 | 3.22E 08 | CC | 10/30 | 1.9 +-0.3 E-02 | 10/25 | L.T. 2. E-02 |
| 10/23 | 10/30 | 3.28E 08 | CC | 11/09 | 1.5 +-0.2 E-02 | 11/02 | L.T. 2. E-02 |
| 10/30 | 11/06 | 3.28E 08 | CC | 11/16 | 3.2 +-0.3 E-02 | 11/08 | L.T. 2. E-02 |
| 11/06 | 11/13 | 3.34E 08 | CC | 11/30 | 3.5 +-0.3 E-02 | 11/16 | L.T. 2. E-02 |
| 11/13 | 11/20 | 3.30E 08 | CC | 11/30 | 3.2 +-0.3 E-02 | 11/27 | L.T. 3. E-02 |
| 11/20 | 11/27 | 3.21E 08 | CC | 12/09 | 2.4 +-0.3 E-02 | 12/01 | L.T. 2. E-02 |
| 11/27 | 12/04 | 3.25E 08 | CC | 12/17 | 2.8 +-0.3 E-02 | 12/08 | L.T. 2. E-02 |
| 12/04 | 12/11 | 3.24E 08 | CC | 12/27 | 3.1 +-0.3 E-02 | 12/13 | L.T. 2. E-02 |
| 12/11 | 12/18 | 3.19E 08 | CC | 12/31 | 3.9 +-0.3 E-02 | 12/22 | L.T. 2. E-02 |
| 12/18 | 12/26 | 3.73E 08 | CC | 01/05 | 4.0 +-0.3 E-02 | 12/29 | L.T. 1. E-02 |
| 12/26 | 01/02 | 3.19E 08 | CC | 01/10 | 3.6 +-0.3 E-02 | 01/06 | L.T. 2. E-02 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 03

| COLLECTION START DATE | DATE STOP DATE | VOLUME | UNITS | MID-COUNT TIME DATE | A P FILTER GROSS BETA (PCI/CU.M.) | MID-COUNT TIME DATE | CHARCOAL FILTER I-131 (PCI/CU.M.) |
|---|---|---|---|---|---|---|---|
| 01/02 | 01/09 | 2.96E 08 | CC | 01/19 | 3.8 +-0.4 E-02 | 01/13 | L.T. 3. E-02 |
| 01/09 | 01/16 | 3.13E 08 | CC | 01/29 | 2.7 +-0.3 E-02 | 01/21 | L.T. 2. E-02 |
| 01/16 | 01/23 | 2.79E 08 | CC | 02/05 | 4.7 +-0.4 E-02 | 01/27 | L.T. 3. E-02 |
| 01/23 | 01/30 | 3.01E 08 | CC | 02/20 | 2.6 +-0.3 E-02 | 02/04 | L.T. 3. E-02 |
| 01/30 | 02/06 | 2.89E 08 | CC | 02/16 | 3.6 +-0.3 E-02 | 02/10 | L.T. 3. E-02 |
| 02/06 | 02/13 | 2.91E 08 | CC | 02/27 | 3.1 +-0.3 E-02 | 02/17 | L.T. 2. E-02 |
| 02/13 | 02/20 | 3.03E 08 | CC | 03/02 | 3.1 +-0.3 E-02 | 02/24 | L.T. 2. E-02 |
| 02/20 | 02/27 | 2.99E 08 | CC | 03/08 | 2.5 +-0.3 E-02 | 03/03 | L.T. 2. E-02 |
| 02/27 | 03/06 | 3.02E 08 | CC | 03/16 | 2.9 +-0.3 E-02 | 03/10 | L.T. 2. E-02 |
| 03/06 | 03/13 | 3.08E 08 | CC | 03/23 | 2.4 +-0.3 E-02 | 03/16 | L.T. 2. E-02 |
| 03/13 | 03/20 | 3.01E 08 | CC | 03/30 | 1.9 +-0.3 E-02 | 03/24 | L.T. 2. E-02 |
| 03/20 | 03/27 | 2.96E 08 | CC | 04/07 | 2.9 +-0.3 E-02 | 03/29 | L.T. 2. E-02 |
| 03/27 | 04/03 | 2.95E 08 | CC | 04/19 | 1.7 +-0.3 E-02 | 04/07 | L.T. 2. E-02 |
| 04/03 | 04/10 | 3.00E 08 | CC | 04/24 | 2.9 +-0.3 E-02 | 04/12 | L.T. 2. E-02 |
| 04/10 | 04/17 | 3.30E 08 | CC | 04/28 | 2.5 +-0.3 E-02 | 04/21 | L.T. 2. E-02 |
| 04/17 | 04/24 | 3.39E 08 | CC | 05/04 | 2.4 +-0.3 E-02 | 04/26 | L.T. 2. E-02 |
| 04/24 | 05/01 | 3.26E 08 | CC | 05/14 | 1.5 +-0.2 E-02 | 05/04 | L.T. 2. E-02 |
| 05/01 | 05/08 | 3.36E 08 | CC | 05/18 | 2.2 +-0.3 E-02 | 05/11 | L.T. 2. E-02 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 03

| COLLECTION START DATE | DATE STOP DATE | VOLUME | UNITS | MID-COUNT TIME DATE | A P FILTER GROSS BETA (PCI/CU.M.) | MID-COUNT TIME DATE | CHARCOAL FILTER I-131 (PCI/CU.M.) |
|---|---|---|---|---|---|---|---|
| 05/02 | 05/15 | 3.25E 08 | CC | 05/26 | 1.8 +-0.3 E-02 | 05/19 | L.T. 2. E-02 |
| 05/15 | 05/22 | 3.10E 08 | CC | 06/01 | 2.1 +-0.3 E-02 | 05/26 | L.T. 2. E-02 |
| (A)05/15 | 05/22 | 3.10E 08 | CC | 06/01 | 2.6 +-0.3 E-02 | 05/30 | L.T. 3. E-02 |
| 05/22 | 05/29 | 3.27E 08 | CC | 06/11 | 2.2 +-0.3 E-02 | 06/01 | L.T. 2. E-02 |
| 05/29 | 06/05 | 3.26E 08 | CC | 06/15 | 2.2 +-0.3 E-02 | 06/07 | L.T. 2. E-02 |
| 06/05 | 06/12 | 3.26E 08 | CC | 06/22 | 2.1 +-0.3 E-02 | 06/15 | L.T. 2. E-02 |
| 06/12 | 06/19 | 3.15E 08 | CC | 06/27 | 2.1 +-0.3 E-02 | 06/22 | L.T. 2. E-02 |
| 06/19 | 06/26 | 2.95E 08 | CC | 07/06 | 2.7 +-0.3 E-02 | 06/30 | L.T. 2. E-02 |
| 06/26 | 07/03 | 2.99E 08 | CC | 07/13 | 2.6 +-0.3 E-02 | 07/06 | L.T. 2. E-02 |
| 07/03 | 07/10 | 3.05E 08 | CC | 07/24 | 2.8 +-0.3 E-02 | 07/12 | L.T. 2. E-02 |
| 07/10 | 07/17 | 3.04E 08 | CC | 07/26 | 2.8 +-0.3 E-02 | 07/21 | L.T. 2. E-02 |
| 07/17 | 07/24 | 3.14E 08 | CC | 08/03 | 2.4 +-0.3 E-02 | 07/28 | L.T. 2. E-02 |
| 07/24 | 07/31 | 3.12E 08 | CC | 08/10 | 2.8 +-0.3 E-02 | 08/02 | L.T. 2. E-02 |
| 07/31 | 08/07 | 3.12E 08 | CC | 08/21 | 2.0 +-0.3 E-02 | 08/10 | L.T. 2. E-02 |
| 08/07 | 08/14 | 3.15E 08 | CC | 08/27 | 2.4 +-0.3 E-02 | 08/17 | L.T. 2. E-02 |
| 08/14 | 08/21 | 3.00E 08 | CC | 08/30 | 2.1 +-0.3 E-02 | 08/26 | L.T. 2. E-02 |
| 08/21 | 08/28 | 3.03E 08 | CC | 09/14 | 2.4 +-0.3 E-02 | 08/30 | L.T. 2. E-02 |
| 08/28 | 09/04 | 3.03E 08 | CC | 09/13 | 3.5 +-0.3 E-02 | 09/06 | L.T. 2. E-02 |

(A) DUPLICATE ANALYSIS

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 03

| COLLECTION START DATE | DATE STOP DATE | VOLUME | UNITS | MID-COUNT TIME DATE | A P FILTER GROSS BETA (PCI/CU.M.) | MID-COUNT TIME DATE | CHARCOAL FILTER I-131 (PCI/CU.M.) |
|---|---|---|---|---|---|---|---|
| 09/04 | 09/11 | 3.00E 08 | CC | 09/21 | 2.9 +-0.3 E-02 | 09/14 | L.T. 2. E-02 |
| 09/11 | 09/18 | 3.05E 08 | CC | 09/27 | 2.3 +-0.3 E-02 | 09/27 | L.T. 2. E-02 |
| 09/18 | 09/25 | 3.10E 08 | CC | 10/01 | 2.7 +-0.3 E-02 | 09/28 | L.T. 2. E-02 |
| 09/25 | 10/02 | 3.13E 08 | CC | 10/12 | 3.7 +-0.3 E-02 | 10/06 | L.T. 2. E-02 |
| (A)09/25 | 10/02 | 3.13E 08 | CC | 10/12 | 3.3 +-0.3 E-02 | 10/10 | L.T. 2. E-02 |
| 10/02 | 10/09 | 3.04E 08 | CC | 10/18 | 2.5 +-0.3 E-02 | 10/13 | L.T. 2. E-02 |
| 10/09 | 10/16 | 3.12E 08 | CC | 10/24 | 3.2 +-0.3 E-02 | 10/18 | L.T. 2. E-02 |
| 10/16 | 10/23 | 3.20E 08 | CC | 10/30 | 2.6 +-0.3 E-02 | 10/25 | L.T. 2. E-02 |
| 10/23 | 10/30 | 3.13E 08 | CC | 11/09 | 2.5 +-0.3 E-02 | 11/02 | L.T. 2. E-02 |
| 10/30 | 11/06 | 3.13E 08 | CC | 11/16 | 2.9 +-0.3 E-02 | 11/08 | L.T. 2. E-02 |
| 11/06 | 11/13 | 3.14E 08 | CC | 11/30 | 3.7 +-0.3 E-02 | 11/16 | L.T. 2. E-02 |
| 11/13 | 11/20 | 3.14E 08 | CC | 11/30 | 3.2 +-0.3 E-02 | 11/27 | L.T. 3. E-02 |
| 11/20 | 11/27 | 3.17E 08 | CC | 12/09 | 2.1 +-0.3 E-02 | 12/01 | L.T. 2. E-02 |
| 11/27 | 12/04 | 3.18E 08 | CC | 12/17 | 2.5 +-0.3 E-02 | 12/08 | L.T. 2. E-02 |
| 12/04 | 12/11 | 3.16E 08 | CC | 12/27 | 2.4 +-0.3 E-02 | 12/13 | L.T. 2. E-02 |
| 12/11 | 12/18 | 3.16E 08 | CC | 12/31 | 3.6 +-0.3 E-02 | 12/22 | L.T. 2. E-02 |
| 12/18 | 12/26 | 3.56E 08 | CC | 01/05 | 4.2 +-0.4 E-02 | 12/29 | L.T. 1. E-02 |
| 12/26 | 01/02 | 3.14E 08 | CC | 01/10 | 4.1 +-0.4 E-02 | 01/06 | L.T. 2. E-02 |

(A) DUPLICATE ANALYSIS

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 12

| COLLECTION START DATE | DATE STOP DATE | VOLUME | UNITS | MID-COUNT TIME DATE | A P FILTER GROSS BETA (PCI/CU.M.) | MID-COUNT TIME DATE | CHARCOAL FILTER I-131 (PCI/CU.M.) |
|---|---|---|---|---|---|---|---|
| 01/02 | 01/09 | 3.09E 08 | CC | 01/19 | 3.2 +-0.3 E-02 | 01/ | L.T. 2. E-02 |
| 01/09 | 01/16 | 3.03E 08 | CC | 01/29 | 2.3 +-0.3 E-02 | 01/2. | L.T. 3. E-02 |
| 01/16 | 01/23 | 3.11E 08 | CC | 02/05 | 4.5 +-0.4 E-02 | 01/27 | L.T. 2. E-02 |
| 01/23 | 01/30 | 3.04E 08 | CC | 02/20 | 2.6 +-0.3 E-02 | 02/04 | L.T. 3. E-02 |
| 01/30 | 02/06 | 3.03E 08 | CC | 02/16 | 3.2 +-0.3 E-02 | 02/10 | L.T. 2. E-02 |
| (a)01/30 | 02/06 | 3.03E 08 | CC | 02/16 | 3.5 +-0.3 E-02 | 02/13 | L.T. 3. E-02 |
| 02/06 | 02/13 | 3.03E 08 | CC | 02/27 | 3.4 +-0.3 E-02 | 02/17 | L.T. 2. E-02 |
| 02/13 | 02/20 | 3.01E 08 | CC | 03/02 | 3.3 +-0.3 E-02 | 02/24 | L.T. 2. E-02 |
| 02/20 | 02/27 | 3.04E 08 | CC | 03/08 | 2.8 +-0.3 E-02 | 03/03 | L.T. 2. E-02 |
| 02/27 | 03/06 | 3.03E 08 | CC | 03/16 | 3.2 +-0.3 E-02 | 03/10 | L.T. 2. E-02 |
| 03/06 | 03/13 | 3.03E 08 | CC | 03/23 | 2.6 +-0.3 E-02 | 03/16 | L.T. 2. E-02 |
| 03/13 | 03/20 | 2.93E 08 | CC | 03/30 | 1.9 +-0.3 E-02 | 03/24 | L.T. 2. E-02 |
| 03/20 | 03/27 | 3.01E 08 | CC | 04/07 | 3.2 +-0.3 E-02 | 03/29 | L.T. 2. E-02 |
| 03/27 | 04/03 | 3.05E 08 | CC | 04/19 | 1.4 +-0.2 E-02 | 04/07 | L.T. 2. E-02 |
| 04/03 | 04/10 | 3.21E 08 | CC | 04/24 | 2.4 +-0.3 E-02 | 04/12 | L.T. 2. E-02 |
| 04/10 | 04/17 | 3.03E 08 | CC | 04/28 | 3.2 +-0.3 E-02 | 04/21 | L.T. 2. E-02 |
| 04/17 | 04/24 | 3.12E 08 | CC | 05/04 | 2.7 +-0.3 E-02 | 04/26 | L.T. 2. E-02 |
| 04/24 | 05/01 | 3.12E 08 | CC | 05/14 | 1.9 +-0.3 E-02 | 05/04 | L.T. 2. E-02 |

(a) DUPLICATE ANALYSIS

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 32

| COLLECTION START DATE | DATE STOP DATE | VOLUME | UNITS | MID-COUNT TIME DATE | A P FILTER GROSS BETA (PCI/CU.M.) | MID-COUNT TIME DATE | CHARCOAL FILTER I-131 (PCI/CU.M.) |
|---|---|---|---|---|---|---|---|
| 05/01 | 05/06 | 3.13E 08 | CC | 05/18 | 2.5 +-0.3 E-02 | 05/11 | L.T. 3. E-02 |
| 05/08 | 05/15 | 2.99E 08 | CC | 05/26 | 2.0 +-0.3 E-02 | 05/19 | L.T. 2. E-02 |
| 05/15 | 05/22 | 3.09E 08 | CC | 06/01 | 2.1 +-0.3 E-02 | 05/26 | L.T. 2. E-02 |
| 05/22 | 05/29 | 3.12E 08 | CC | 06/11 | 2.9 +-0.3 E-02 | 06/01 | L.T. 2. E-02 |
| 05/29 | 06/05 | 3.06E 08 | CC | 06/15 | 2.3 +-0.3 E-02 | 06/07 | L.T. 2. E-02 |
| 06/05 | 06/12 | 3.03E 08 | CC | 06/22 | 2.0 +-0.3 E-02 | 06/15 | L.T. 2. E-02 |
| (A)06/05 | 06/12 | 3.03E 08 | CC | 06/22 | 2.0 +-0.3 E-02 | 06/17 | L.T. 2. E-02 |
| 06/12 | 06/19 | 3.02E 08 | CC | 06/27 | 1.9 +-0.3 E-02 | 06/22 | L.T. 2. E-02 |
| 06/19 | 06/26 | 3.05E 08 | CC | 07/06 | 2.8 +-0.3 E-02 | 06/30 | L.T. 2. E-02 |
| 06/26 | 07/03 | 3.02E 08 | CC | 07/13 | 3.0 +-0.3 E-02 | 07/06 | L.T. 2. E-02 |
| 07/03 | 07/10 | 3.09E 08 | CC | 07/24 | 3.1 +-0.3 E-02 | 07/12 | L.T. 2. E-02 |
| 07/10 | 07/17 | 2.99E 08 | CC | 07/26 | 2.8 +-0.3 E-02 | 07/21 | L.T. 2. E-02 |
| 07/17 | 07/24 | 3.00E 08 | CC | 08/03 | 1.9 +-0.3 E-02 | 07/28 | L.T. 2. E-02 |
| 07/24 | 07/31 | 3.02E 08 | CC | 08/10 | 2.9 +-0.3 E-02 | 08/02 | L.T. 2. E-02 |
| 07/31 | 08/07 | 3.09E 08 | CC | 08/21 | 2.3 +-0.3 E-02 | 08/10 | L.T. 2. E-02 |
| 08/07 | 08/14 | 3.10E 08 | CC | 08/27 | 2.5 +-0.3 E-02 | 08/17 | L.T. 2. E-02 |
| 08/14 | 08/21 | 2.93E 08 | CC | 08/30 | 2.1 +-0.3 E-02 | 08/26 | L.T. 2. E-02 |
| 08/21 | 08/28 | 3.03E 08 | CC | 09/14 | 2.7 +-0.3 E-02 | 08/30 | L.T. 2. E-02 |

(A) DUPLICATE ANALYSIS

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 32

| COLLECTION START DATE | DATE STOP DATE | VOLUME | UNITS | MID-COUNT TIME DATE | A P FILTER GROSS BETA (PCI/CU.M.) | MID-COUNT TIME DATE | CHARCOAL FILTER I-131 (PCI/CU.M.) |
|---|---|---|---|---|---|---|---|
| 08/28 | 09/04 | 2.97E 08 | CC | 09/13 | 4.1 +-0.4 E-02 | 09/06 | L.T. 2. E-02 |
| 09/04 | 09/11 | 2.95E 08 | CC | 09/21 | 3.2 +-0.3 E-02 | 09/14 | L.T. 2. E-02 |
| 09/11 | 09/18 | 3.04E 08 | CC | 09/27 | 2.2 +-0.3 E-02 | 09/22 | L.T. 2. E-02 |
| 09/18 | 09/25 | 3.02E 08 | CC | 10/01 | 2.4 +-0.3 E-02 | 09/28 | L.T. 2. E-02 |
| 09/25 | 10/02 | 3.03E 08 | CC | 10/12 | 4.0 +-0.4 E-02 | 10/06 | L.T. 2. E-02 |
| 10/02 | 10/09 | 3.05E 08 | CC | 10/18 | 2.6 +-0.3 E-02 | 10/13 | L.T. 2. E-02 |
| 10/09 | 10/16 | 3.08E 08 | CC | 10/24 | 3.4 +-0.3 E-02 | 10/19 | L.T. 2. E-02 |
| 10/16 | 10/23 | 3.18E 08 | CC | 10/30 | 2.8 +-0.3 E-02 | 10/25 | L.T. 2. E-02 |
| 10/23 | 10/30 | 3.30E 08 | CC | 11/09 | 2.9 +-0.3 E-02 | 11/02 | L.T. 2. E-02 |
| 10/30 | 11/06 | 3.20E 08 | CC | 11/16 | 3.4 +-0.3 E-02 | 11/08 | L.T. 2. E-02 |
| (A)10/30 | 11/06 | 3.20E 08 | CC | 11/16 | 3.2 +-0.3 E-02 | 11/11 | L.T. 9. E-03 |
| 11/06 | 11/13 | 3.19E 08 | CC | 11/30 | 3.6 +-0.3 E-02 | 11/16 | L.T. 2. E-02 |
| 11/13 | 11/20 | 3.22E 08 | CC | 11/30 | 3.1 +-0.3 E-02 | 11/27 | L.T. 3. E-02 |
| 11/20 | 11/27 | 3.19E 08 | CC | 12/09 | 2.4 +-0.3 E-02 | 12/01 | L.T. 2. E-02 |
| 11/27 | 12/04 | 3.27E 08 | CC | 12/17 | 2.5 +-0.3 E-02 | 12/08 | L.T. 2. E-02 |
| 12/04 | 12/11 | 3.27E 08 | CC | 12/27 | 2.9 +-0.3 E-02 | 12/13 | L.T. 2. E-02 |
| 12/11 | 12/18 | 3.22E 08 | CC | 12/31 | 4.0 +-0.3 E-02 | 12/22 | L.T. 2. E-02 |
| 12/18 | 12/26 | 3.67E 08 | CC | 01/05 | 4.0 +-0.4 E-02 | 12/29 | L.T. 1. E-02 |

(A) DUPLICATE ANALYSIS

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 32

| COLLECTION START DATE | DATE STOP DATE | VOLUME | UNITS | MID-COUNT TIME DATE | A P FILTER GROSS BETA (PCI/CU.M.) | MID-COUNT TIME DATE | CHARCOAL FILTER I-131 (PCI/CU.M.) |
|---|---|---|---|---|---|---|---|
| 12/26 | 01/02 | 3.24E 04 | CC | 01/10 | 4.1 +-0.4 E-02 | 01/06 | L.T. 2. E-02 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 37

| COLLECTION START DATE | DATE STOP DATE | VOLUME | UNITS | MID-COUNT TIME DATE | A P FILTER GROSS BETA (PCI/CU.M.) | MID-COUNT TIME DATE | CHARCOAL FILTER I-131 (PCI/CU.M.) |
|---|---|---|---|---|---|---|---|
| 01/02 | 01/09 | 3.15E 08 | CC | 01/19 | 3.4 +-0.3 E-02 | 01/13 | L.T. 2. E-02 |
| 01/09 | 01/16 | 3.02E 08 | CC | 01/29 | 2.4 +-0.3 E-02 | 01/21 | L.T. 3. E-02 |
| 01/16 | 01/23 | 3.09E 08 | CC | 02/05 | 5.0 +-0.4 E-02 | 01/27 | L.T. 2. E-02 |
| 01/23 | 01/30 | 3.06E 08 | CC | 02/20 | 1.0 +-0.2 E-02 | 02/04 | L.T. 3. E-02 |
| 01/30 | 02/06 | 2.89E 08 | CC | 02/16 | 3.4 +-0.3 E-02 | 02/10 | L.T. 3. E-02 |
| 02/06 | 02/13 | 2.96E 08 | CC | 02/27 | 3.1 +-0.3 E-02 | 02/17 | L.T. 2. E-02 |
| 02/13 | 02/20 | 2.97E 08 | CC | 03/02 | 3.3 +-0.3 E-02 | 02/24 | L.T. 2. E-02 |
| 02/20 | 02/27 | 2.90E 08 | CC | 03/08 | 3.1 +-0.3 E-02 | 03/03 | L.T. 2. E-02 |
| 02/27 | 03/06 | 2.91E 08 | CC | 03/16 | 3.3 +-0.3 E-02 | 03/10 | L.T. 2. E-02 |
| 03/06 | 03/13 | 2.97E 08 | CC | 03/23 | 2.0 +-0.3 E-02 | 03/16 | L.T. 3. E-02 |
| 03/13 | 03/20 | 2.97E 08 | CC | 03/30 | 2.3 +-0.3 E-02 | 03/24 | L.T. 2. E-02 |
| (A)03/13 | 03/20 | 2.97E 08 | CC | 03/30 | 2.2 +-0.3 E-02 | 03/29 | L.T. 2. E-02 |
| 03/20 | 03/27 | 2.96E 08 | CC | 04/07 | 2.9 +-0.3 E-02 | 03/29 | L.T. 2. E-02 |
| 03/27 | 04/03 | 2.90E 08 | CC | 04/19 | 2.5 +-0.3 E-02 | 04/07 | L.T. 2. E-02 |
| 04/03 | 04/10 | 2.99E 08 | CC | 04/24 | 2.8 +-0.3 E-02 | 04/12 | L.T. 2. E-02 |
| 04/10 | 04/17 | 3.15E 08 | CC | 04/28 | 3.4 +-0.3 E-02 | 04/21 | L.T. 2. E-02 |
| 04/17 | 04/24 | 2.98E 08 | CC | 05/04 | 2.4 +-0.3 E-02 | 04/26 | L.T. 2. E-02 |
| 04/24 | 05/01 | 3.16E 08 | CC | 05/14 | 2.0 +-0.3 E-02 | 05/04 | L.T. 2. E-02 |

(A) DUPLICATE ANALYSIS

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 37

| COLLECTION START DATE | DATE STOP DATE | VOLUME | UNITS | MID-COUNT TIME DATE | A P FILTER GROSS BETA (PCI/CU.M.) | MID-COUNT TIME DATE | CHARCOAL FILTER I-131 (PCI/CU.M.) |
|---|---|---|---|---|---|---|---|
| 05/01 | 05/08 | 3.36E 08 | CC | 05/18 | 2.3 +-0.3 E-02 | 05/11 | L.T. 2. E-02 |
| 05/08 | 05/15 | 3.21E 08 | CC | 05/26 | 1.9 +-0.3 E-02 | 05/19 | L.T. 2. E-02 |
| 05/15 | 05/22 | 2.99E 08 | CC | 06/01 | 2.4 +-0.3 E-02 | 05/26 | L.T. 2. E-02 |
| 05/22 | 05/29 | 3.18E 08 | CC | 06/11 | 2.4 +-0.3 E-02 | 06/01 | L.T. 2. E-02 |
| 05/29 | 06/05 | 3.06E 08 | CC | 06/15 | 2.2 +-0.3 E-02 | 06/07 | L.T. 2. E-02 |
| 06/05 | 06/12 | 3.15E 08 | CC | 06/22 | 2.2 +-0.3 E-02 | 06/15 | L.T. 2. E-02 |
| 06/12 | 06/19 | 3.20E 08 | CC | 06/27 | 2.2 +-0.3 E-02 | 06/22 | L.T. 2. E-02 |
| 06/19 | 06/26 | 3.10E 08 | CC | 07/06 | 2.7 +-0.3 E-02 | 06/30 | L.T. 2. E-02 |
| 06/26 | 07/03 | 3.19E 08 | CC | 07/13 | 2.9 +-0.3 E-02 | 07/06 | L.T. 2. E-02 |
| 07/03 | 07/10 | 3.30E 08 | CC | 07/24 | 2.8 +-0.3 E-02 | 07/12 | L.T. 2. E-02 |
| (A)07/03 | 07/10 | 3.30E 08 | CC | 07/24 | 3.1 +-0.3 E-02 | 07/13 | L.T. 3. E-02 |
| 07/10 | 07/17 | 2.99E 08 | CC | 07/26 | 2.7 +-0.3 E-02 | 07/21 | L.T. 2. E-02 |
| 07/17 | 07/24 | 3.04E 08 | CC | 08/03 | 2.0 +-0.3 E-02 | 07/28 | L.T. 2. E-02 |
| 07/24 | 07/31 | 2.97E 08 | CC | 08/10 | 3.2 +-0.3 E-02 | 08/02 | L.T. 2. E-02 |
| 07/31 | 08/07 | 2.98E 08 | CC | 08/21 | 2.2 +-0.3 E-02 | 08/10 | L.T. 2. E-02 |
| 08/07 | 08/14 | 2.95E 08 | CC | 08/27 | 2.8 +-0.3 E-02 | 08/17 | L.T. 2. E-02 |
| 08/14 | 08/21 | 2.96E 08 | CC | 08/30 | 2.4 +-0.3 E-02 | 08/26 | L.T. 2. E-02 |
| 08/21 | 08/28 | 3.03E 08 | CC | 09/14 | 2.9 +-0.3 E-02 | 08/30 | L.T. 2. E-02 |

(A) DUPLICATE ANALYSIS

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 37

| COLLECTION START DATE | DATE STOP DATE | VOLUME | UNITS | MID-COUNT TIME DATE | A P FILTER GROSS BETA (PCI/CU.M.) | MID-COUNT TIME DATE | CHARCOAL FILTER I-131 (PCI/CU.M.) |
|---|---|---|---|---|---|---|---|
| 08/28 | 09/04 | 2.98E 08 | CC | 09/13 | 4.0 +-0.4 E-02 | 09/06 | L.T. 2. E-02 |
| 09/04 | 09/11 | 2.95E 08 | CC | 09/21 | 3.4 +-0.3 E-02 | 09/14 | L.T. 2. E-02 |
| 09/11 | 09/18 | 3.00E 08 | CC | 09/27 | 2.3 +-0.3 E-02 | 09/22 | L.T. 2. E-02 |
| 09/18 | 09/25 | 3.00E 08 | CC | 10/01 | 2.5 +-0.3 E-02 | 09/28 | L.T. 2. E-02 |
| 09/25 | 10/02 | 3.03E 08 | CC | 10/12 | 4.? +-0.4 E-02 | 10/06 | L.T. 2. E-02 |
| 10/02 | 10/09 | 3.00E 08 | CC | 10/18 | 2.3 +-0.3 E-02 | 10/13 | L.T. 2. E-02 |
| 10/09 | 10/16 | 3.41E 08 | CC | 10/24 | 3.? +-0.3 E-02 | 10/18 | L.T. 2. E-02 |
| 10/16 | 10/23 | 3.98E 08 | CC | 10/30 | 2.2 +-0.2 E-02 | 10/25 | L.T. 1. E-02 |
| 10/23 | 10/30 | 3.30E 08 | CC | 11/09 | 2.9 +-0.3 E-02 | 11/02 | L.T. 2. E-02 |
| 10/30 | 11/06 | 3.18E 08 | CC | 11/16 | 3.0 +-0.3 E-02 | 11/08 | L.T. 2. E-02 |
| 11/06 | 11/13 | 3.19E 08 | CC | 11/30 | 4.2 +-0.4 E-02 | 11/16 | L.T. 2. E-02 |
| 11/13 | 11/20 | 3.15E 08 | CC | 12/30 | 3.5 +-0.3 E-02 | 11/27 | L.T. 3. E-02 |
| 11/20 | 11/27 | 3.07E 08 | CC | 12/09 | 2.5 +-0.3 E-02 | 12/01 | L.T. 2. E-02 |
| 11/27 | 12/04 | 3.04E 08 | CC | 12/17 | 3.2 +-0.3 E-02 | 12/08 | L.T. 2. E-02 |
| (A)11/27 | 12/04 | 3.04E 08 | CC | 12/17 | 3.2 +-0.3 E-02 | 12/11 | L.T. 3. E-02 |
| 12/04 | 12/11 | 3.24E 08 | CC | 12/27 | 3.2 +-0.3 E-02 | 12/13 | L.T. 2. E-02 |
| 12/11 | 12/18 | 3.18E 08 | CC | 12/31 | 4.2 +-0.3 E-02 | 12/22 | L.T. 2. E-02 |
| 12/18 | 12/26 | 3.50E 08 | CC | 01/05 | 4.6 +-0.4 E-02 | 12/29 | L.T. 1. E-02 |

(A) DUPLICATE ANALYSIS

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 37

| COLLECTION START DATE | DATE STOP DATE | VOLUME | UNITS | MID-COUNT TIME DATE | A P FILTER GROSS BETA (PCI/CU.M.) | MID-COUNT TIME DATE | CHARCOAL FILTER I-131 (PCI/CU.M.) |
|---|---|---|---|---|---|---|---|
| 12/26 | 01/02 | 3.19E 03 | CC | 01/10 | 3.9 +-0.3 E-02 | 01/06 | L.T. 2. E-02 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 40

| COLLECTION START DATE | DATE STOP DATE | VOLUME | UNITS | MID-COUNT TIME DATE | A P FILTER GROSS BETA (PCI/CU.M.) | MID-COUNT TIME DATE | CHARCOAL FILTER I-131 (PCI/CU.M.) |
|---|---|---|---|---|---|---|---|
| 01/02 | 01/09 | 3.26E 08 | CC | 01/19 | 3.1 +-0.3 E-02 | 01/13 | L.T. 2. E-02 |
| 01/09 | 01/16 | 3.24E 08 | CC | 01/29 | 2.1 +-0.3 E-02 | 01/21 | L.T. 2. E-02 |
| 01/16 | 01/23 | 3.25E 08 | CC | 02/05 | 4.3 +-0.4 E-02 | 01/27 | L.T. 2. E-02 |
| 01/23 | 01/30 | 3.17E 08 | CC | 02/20 | 2.4 +-0.3 E-02 | 02/04 | L.T. 2. E-02 |
| 01/30 | 02/06 | 3.10E 08 | CC | 02/16 | 3.4 +-0.3 E-02 | 02/10 | L.T. 2. E-02 |
| 02/06 | 02/13 | 2.94E 08 | CC | 02/27 | 3.2 +-0.3 E-02 | 02/17 | L.T. 2. E-02 |
| 02/13 | 02/20 | 3.07E 08 | CC | 03/02 | 3.3 +-0.3 E-02 | 02/24 | L.T. 2. E-02 |
| 02/20 | 02/27 | 3.10E 08 | CC | 03/08 | 2.9 +-0.3 E-02 | 03/03 | L.T. 2. E-02 |
| [A1] 02/20 | 02/27 | 3.10E 08 | CC | 03/08 | 2.8 +-0.3 E-02 | 03/07 | L.T. 3. E-02 |
| 02/27 | 03/06 | 3.02E 08 | CC | 03/16 | 3.2 +-0.3 E-02 | 03/10 | L.T. 2. E-02 |
| 03/06 | 03/13 | 2.94E 08 | CC | 03/23 | 2.3 +-0.3 E-02 | 03/16 | L.T. 2. E-02 |
| 03/13 | 03/20 | 2.90E 08 | CC | 03/30 | 2.1 +-0.3 E-02 | 03/24 | L.T. 2. E-02 |
| 03/20 | 03/27 | 2.91E 08 | CC | 04/07 | 3.0 +-0.3 E-02 | 03/29 | L.T. 2. E-02 |
| 03/27 | 04/03 | 2.95E 08 | CC | 04/19 | 2.4 +-0.3 E-02 | 04/07 | L.T. 1. E-02 |
| 04/03 | 04/10 | 3.01E 08 | CC | 04/24 | 2.9 +-0.3 E-02 | 04/12 | L.T. 2. E-02 |
| 04/10 | 04/17 | 3.01E 08 | CC | 04/28 | 3.3 +-0.3 E-02 | 04/21 | L.T. 2. E-02 |
| 04/17 | 04/24 | 2.97E 08 | CC | 05/04 | 2.4 +-0.3 E-02 | 04/26 | L.T. 2. E-02 |
| 04/24 | 05/01 | 3.12E 08 | CC | 05/14 | 1.5 +-0.3 E-02 | 05/04 | L.T. 2. E-02 |

[A1] DUPLICATE ANALYSIS

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 40

| COLLECTION START DATE | DATE STOP DATE | VOLUME | UNITS | MID-COUNT TIME DATE | A P FILTER GROSS BETA (PCI/CU.M.) | MID-COUNT TIME DATE | CHARCOAL FILTER I-131 (PCI/CU.M.) |
|---|---|---|---|---|---|---|---|
| (A)04/24 | 05/01 | 3.12E 08 | CC | 05/14 | 1.8 +-0.3 E-02 | 05/08 | L.T. 3. E-02 |
| 05/01 | 05/08 | 3.04E 08 | CC | 05/18 | 2.0 +-0.3 E-02 | 05/11 | L.T. 2. E-02 |
| 05/08 | 05/15 | 3.02E 08 | CC | 05/26 | 1.9 +-0.3 E-02 | 05/19 | L.T. 2. E-02 |
| 05/15 | 05/22 | 3.07E 08 | CC | 06/01 | 2.1 +-0.3 E-02 | 05/26 | L.T. 2. E-02 |
| 05/22 | 05/29 | 3.08E 08 | CC | 06/11 | 2.4 +-0.3 E-02 | 06/01 | L.T. 2. E-02 |
| 05/29 | 06/05 | 2.91E 08 | CC | 06/15 | 2.3 +-0.3 E-02 | 06/07 | L.T. 2. E-02 |
| 06/05 | 06/12 | 2.83E 08 | CC | 06/22 | 2.4 +-0.3 E-02 | 06/15 | L.T. 2. E-02 |
| 06/12 | 06/19 | 2.97E 08 | CC | 06/27 | 2.1 +-0.3 E-02 | 06/22 | L.T. 2. E-02 |
| 06/19 | 06/26 | 2.78E 08 | CC | 07/06 | 2.8 +-0.3 E-02 | 06/30 | L.T. 2. E-02 |
| 06/26 | 07/03 | 3.11E 08 | CC | 07/13 | 2.9 +-0.3 E-02 | 07/06 | L.T. 2. E-02 |
| 07/03 | 07/10 | 2.95E 08 | CC | 07/24 | 2.8 +-0.3 E-02 | 07/12 | L.T. 2. E-02 |
| 07/10 | 07/17 | 2.98E 08 | CC | 07/26 | 3.0 +-0.3 E-02 | 07/21 | L.T. 1. E-02 |
| 07/17 | 07/24 | 3.05E 08 | CC | 08/03 | 1 +-0.3 E-02 | 07/28 | L.T. 2. E-02 |
| 07/24 | 07/31 | 3.02E 08 | CC | 08/10 | 2.7 +-0.3 E-02 | 08/02 | L.T. 1. E-02 |
| 07/31 | 08/07 | 2.98E 08 | CC | 08/21 | 2.3 +-0.3 E-02 | 08/10 | L.T. 1. E-02 |
| 08/07 | 08/14 | 3.03E 08 | CC | 08/27 | 2.3 +-0.3 E-02 | 08/17 | L.T. 2. E-02 |
| 08/14 | 08/21 | 3.02E 08 | CC | 08/30 | 2.4 +-0.3 E-02 | 08/26 | L.T. 1. E-02 |
| 08/21 | 08/28 | 3.02E 08 | CC | 09/14 | 2.4 +-0.3 E-02 | 08/30 | L.T. 2. E-02 |

(A) Duplicate Analysis

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 40

| COLLECTION START DATE | DATE STOP DATE | VOLUME | UNITS | MID-COUNT TIME DATE | A P FILTER GROSS BETA (PCI/CU.M.) | MID-COUNT TIME DATE | CHARCOAL FILTER I-131 (PCI/CU.M.) |
|---|---|---|---|---|---|---|---|
| 08/28 | 09/04 | 3.03E 08 | CC | 09/13 | 3.4 +-0.3 E-02 | 09/06 | L.T. 2. E-02 |
| (A)08/28 | 09/04 | 3.03E 08 | CC | 09/13 | 3.5 +-0.3 E-02 | 09/07 | L.T. 2. E-02 |
| 09/04 | 09/11 | 2.95E 08 | CC | 09/21 | 2.7 +-0.3 E-02 | 09/14 | L.T. 2. E-02 |
| 09/11 | 09/18 | 2.99E 08 | CC | 09/27 | 2.2 +-0.3 E-02 | 09/22 | L.T. 2. E-02 |
| 09/18 | 09/25 | 2.91E 08 | CC | 10/01 | 2.3 +-0.3 E-02 | 09/28 | L.T. 2. E-02 |
| 09/25 | 10/02 | 2.93E 08 | CC | 10/12 | 3.6 +-0.3 E-02 | 10/06 | L.T. 2. E-02 |
| 10/02 | 10/09 | 2.88E 08 | CC | 10/18 | 2.5 +-0.3 E-02 | 10/13 | L.T. 2. E-02 |
| 10/09 | 10/16 | 2.90E 08 | CC | 10/24 | 2.6 +-0.3 E-02 | 10/18 | L.T. 2. E-02 |
| 10/16 | 10/23 | 3.18E 08 | CC | J/30 | 2.7 +-0.3 E-02 | 10/25 | L.T. 1. E-02 |
| 10/23 | 10/30 | 3.28E 08 | CC | 11/09 | 2.5 +-0.3 E-02 | 11/02 | L.T. 2. E-02 |
| 10/30 | 11/06 | 3.18E 08 | CC | 11/16 | 2.9 +-0.3 E-02 | 11/05 | L.T. 1. E-02 |
| 11/06 | 11/13 | 3.19E 08 | CC | 11/30 | 3.8 +-0.3 E-02 | 11/16 | L.T. 1. E-02 |
| 11/13 | 11/20 | 3.13E 08 | CC | 11/30 | 2.7 +-0.3 E-02 | 11/27 | L.T. 2. E-02 |
| 11/20 | 11/27 | 3.08E 08 | CC | 12/09 | 2.2 +-0.3 E-02 | 12/01 | L.T. 2. E-02 |
| 11/27 | 12/04 | 3.26E 08 | CC | 12/17 | 2.4 +-0.3 E-02 | 12/08 | L.T. 2. E-02 |
| 12/04 | 12/11 | 3.31E 08 | CC | 12/27 | 2.8 +-0.3 E-02 | 12/13 | L.T. 1. E-02 |
| 12/11 | 12/18 | 3.22E 08 | CC | 12/31 | 3.8 +-0.3 E-02 | 12/22 | L.T. 1. E-02 |
| 12/18 | 12/26 | 3.85E 08 | CC | 01/05 | 3.7 +-0.3 E-02 | 12/29 | L.T. 9. E-03 |

(A) DUPLICATE ANALYSIS

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AIRBORNE

AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 40

| COLLECTION START DATE | DATE STOP DATE | VOLUME | UNITS | MID-COUNT TIME DATE | A P FILTER GROSS BETA (PCI/CU.M.) | MID-COUNT TIME DATE | CHARCOAL FILTER I-131 (PCI/CU.M.) |
|---|---|---|---|---|---|---|---|
| 12/26 | 01/02 | 3.49E 08 | CC | 01/10 | 4.0 +-0.3 E-02 | 01/06 | L.T. 1. E-02 |
| (A)12/26 | 01/02 | 3.49E 08 | CC | 01/10 | 4.1 +-0.3 E-02 | 01/08 | L.T. 2. E-02 |

(A) DUPLICATE ANALYSIS

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - INGESTION

ANIMALS/GAME

EPCI/GM WET 1

STATION NUMBER N

| DATE COLLECTED | 01/25 | 01/25 |
|---|---|---|
| | BOBWHITE QUAIL | E COTTONTAIL |
| GAMMA SPECTRUM ANALYSIS: | | |
| BE-7 | L.T. 2. E-01 | L.T. 1. E-01 |
| K-40 | 3.59+-0.36E 00 | 3.29+-0.33E 00 |
| MN-54 | L.T. 2. E-02 | L.T. 1. E-02 |
| CO-58 | L.T. 2. E-02 | L.T. 2. E-02 |
| FE-59 | L.T. 5. E-02 | L.T. 4. E-02 |
| CO-60 | L.T. 2. E-02 | L.T. 1. E-02 |
| ZN-65 | L.T. 4. E-02 | L.T. 3. E-02 |
| NB-95/ZR-95 | L.T. 2. E-02 | L.T. 1. E-02 |
| RU-103 | L.T. 3. E-02 | L.T. 2. E-02 |
| RU-106 | L.T. 2. E-01 | L.T. 1. E-01 |
| I-131 | L.T. 2. E-01 | L.T. 2. E-01 |
| CS-134 | L.T. 2. E-02 | L.T. 1. E-02 |
| CS-137 | L.T. 2. E-02 | L.T. 1. E-02 |
| LA-140/BA-140 | L.T. 7. E-02 | L.T. 6. E-02 |
| CE-141 | L.T. 5. E-02 | L.T. 4. E-02 |
| CE-144 | L.T. 1. E-01 | L.T. 1. E-01 |
| RA-226 | L.T. 4. E-01 | L.T. 3. E-01 |
| TH-228 | L.T. 3. E-02 | L.T. 2. E-02 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - INGESTION

ANIMALS/GAME

(PCI/GM WET )

STATION NUMBER SE

| DATE COLLECTED | 01/25 BOBWHITE QUAIL | 01/25 E COTTONTAIL |
|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | |
| BE-7 | L.T. 2. E-01 | L.T. 2. E-01 |
| K-40 | 3.84+-0.38E 00 | 3.81+-0.38E 00 |
| MN-54 | L.T. 2. E-02 | L.T. 2. E-02 |
| CO-58 | L.T. 2. E-02 | L.T. 2. E-02 |
| FE-59 | L.T. 5. E-02 | L.T. 5. E-02 |
| CO-60 | L.T. 2. E-02 | L.T. 2. E-02 |
| ZN-65 | L.T. 4. E-02 | L.T. 4. E-02 |
| NB-95/ZR-95 | L.T. 2. E-02 | L.T. 2. E-02 |
| RU-103 | L.T. 2. E-02 | L.T. 3. E-02 |
| RU-106 | L.T. 1. E-01 | L.T. 1. E-01 |
| I-131 | L.T. 2. E-01 | L.T. 2. E-01 |
| CS-134 | L.T. 2. E-02 | L.T. 2. E-02 |
| CS-137 | L.T. 2. E-02 | L.T. 2. E-02 |
| BA-140/BA-140 | L.T. 8. E-02 | L.T. 8. E-02 |
| CE-141 | L.T. 3. E-02 | L.T. 5. E-02 |
| CE-144 | L.T. 9. E-02 | L.T. 1. E-01 |
| RA-226 | L.T. 3. E-01 | L.T. 3. E-01 |
| TH-228 | L.T. 2. E-02 | L.T. 4. E-02 |

WOLF CREEK NUCLEAR OPERATING CORP

AIR PARTICULATE FILTERS
EXPOSURE PATHWAY - AIRBORNE

ISOTOPIC ANALYSIS ON QUARTERLY COMPOSITE

( PCI/CU.M. )

STATION NUMBER 02

| DATE COLLECTED | 01/02-04/03 | 04/03-07/03 | 07/03-10/02 | 10/02-01/02 |
|---|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | | |
| BE-7 | 5.37+-0.54E-02 | 4.93+-0.66E-02 | .24+-0.62E-02 | 5.52+-0.61E-02 |
| K-40 | 8.83+-4.91E-03 | 9.35+-4.86E-03 | L.T. 8. E-03 | L.T. 8. E-03 |
| MN-54 | L.T. 4. E-04 | L.T. 4. E-04 | L.T. 4. E-04 | L.T. 4. E-04 |
| CO-58 | L.T. 5. E-04 | L.T. 5. E-04 | L.T. 4. E-04 | L.T. 4. E-04 |
| FE-59 | L.T. 1. E-03 | L.T. 1. E-03 | L.T. 1. E-03 | L.T. 1. E-03 |
| CO-60 | L.T. 6. E-04 | L.T. 4. E-04 | L.T. 5. E-04 | L.T. 6. E-04 |
| ZN-65 | L.T. 1. E-03 | L.T. 9. E-04 | L.T. 9. E-04 | L.T. 1. E-03 |
| NB-95/ZR-95 | L.T. 5. E-04 | L.T. 5. E-04 | L.T. 5. E-04 | L.T. 5. E-04 |
| RU-103 | L.T. 6. E-04 | L.T. 5. E-04 | L.T. 5. E-04 | L.T. 5. E-04 |
| RU-106 | L.T. 4. E-03 | L.T. 4. E-03 | L.T. 4. E-03 | L.T. 3. E-03 |
| I-131 | L.T. 4. E-03 | L.T. 2. E-03 | L.T. 2. E-03 | L.T. 3. E-03 |
| CS-134 | L.T. 5. E-04 | L.T. 5. E-04 | L.T. 4. E-04 | L.T. 5. E-04 |
| CS-137 | L.T. 5. E-04 | L.T. 4. E-04 | L.T. 5. E-04 | L.T. 5. E-04 |
| LA-140/BA-140 | L.T. 3. E-03 | L.T. 1. E-03 | L.T. 2. E-03 | L.T. 2. E-03 |
| CE-141 | L.T. 7. E-04 | L.T. 8. E-04 | L.T. 8. E-04 | L.T. 9. E-04 |
| CE-144 | L.T. 2. E-03 | L.T. 2. E-03 | L.T. 2. E-03 | L.T. 2. E-03 |
| RA-226 | L.T. 6. E-03 | L.T. 8. E-03 | L.T. 8. E-03 | L.T. 9. E-03 |
| TH-228 | L.T. 5. E-04 | L.T. 7. E-04 | L.T. 7. E-04 | L.T. 7. E-04 |

WOLF CREEK NUCLEAR OPERATING CORP

AIR PARTICULATE FILTERS
EXPOSURE PATHWAY - AIRBORNE

ISOTOPIC ANALYSIS ON QUARTERLY COMPOSITE

( PCI/CU.M. )

STATION NUMBER 03

| DATE COLLECTED | 01/02-04/03 | 04/03-07/03 | 07/03-10/02 | 10/02-01/02 |
|---|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | | |
| BE-7 | 5.65+-0.56E-02 | 4.14+-0.52E-02 | 5.35+-0.57E-02 | 4.84+-0.61E-02 |
| K-40 | 1.30+-0.30E-02 | L.T. 9. E-03 | L.T. 8. E-03 | L.T. 1. E-02 |
| MN-54 | L.T. 3. E-04 | L.T. 4. E-04 | L.T. 3. E-04 | L.T. 5. E-04 |
| CO-58 | L.T. 3. E-04 | L.T. 4. E-04 | L.T. 4. E-04 | L.T. 6. E-04 |
| FE-59 | L.T. 7. E-04 | L.T. 9. E-04 | L.T. 9. E-04 | L.T. 1. E-03 |
| CO-60 | L.T. 3. E-04 | L.T. 4. E-04 | L.T. 4. E-04 | L.T. 7. E-04 |
| ZN-65 | L.T. 6. E-04 | L.T. 9. E-04 | L.T. 8. E-04 | L.T. 1. E-03 |
| NB-95/ZR-95 | L.T. 4. E-04 | L.T. 4. E-04 | L.T. 4. E-04 | L.T. 6. E-04 |
| RU-103 | L.T. 4. E-04 | L.T. 5. E-04 | L.T. 4. E-04 | L.T. 6. E-04 |
| RU-106 | L.T. 2. E-03 | L.T. 4. E-03 | L.T. 3. E-03 | L.T. 4. E-03 |
| I-131 | L.T. 3. E-03 | L.T. 2. E-03 | L.T. 2. E-03 | L.T. 3. E-03 |
| CS-134 | L.T. 3. E-04 | L.T. 3. E-04 | L.T. 3. E-04 | L.T. 5. E-04 |
| CS-137 | L.T. 3. E-04 | L.T. 4. E-04 | L.T. 3. E-04 | L.T. 5. E-04 |
| LA-140/BA-140 | L.T. 2. E-03 | L.T. 1. E-03 | L.T. 1. E-03 | L.T. 2. E-03 |
| CE-141 | L.T. 6. E-04 | L.T. 8. E-04 | L.T. 7. E-04 | L.T. 1. E-03 |
| CE-144 | L.T. 1. E-03 | L.T. 2. E-03 | L.T. 2. E-03 | L.T. 3. E-03 |
| RA-226 | L.T. 5. E-03 | L.T. 7. E-03 | L.T. 6. E-03 | L.T. 9. E-03 |
| TH-228 | L.T. 5. E-04 | L.T. 7. E-04 | L.T. 6. E-04 | L.T. 9. E-04 |

WOLF CREEK NUCLEAR OPERATING CORP

AIR PARTICULATE FILTERS
EXPOSURE PATHWAY - AIRBORNE

ISOTOPIC ANALYSIS ON QUARTERLY COMPOSITE

( PCI/CU.M. )

STATION NUMBER 32

| DATE COLLECTED | 01/02-04/03 | 04/03-07/03 | 07/03-10/02 | 10/02-01/02 |
|---|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | | |
| BE-7 | 5.82+-0.58E-02 | 1.33+-0.37E-02 | 6.47+-0.65E-02 | 4.89+-0.53E-02 |
| K-40 | L.T. 1. E-02 | L.T. 7. E-03 | L.T. 1. E-02 | 7.53+-3.91E-03 |
| MN-54 | L.T. 3. E-04 | L.T. 4. E-04 | L.T. 5. E-04 | L.T. 5. E-04 |
| CO-58 | L.T. 4. E-04 | L.T. 4. E-04 | L.T. 5. E-04 | L.T. 5. E-04 |
| FE-59 | L.T. 1. E-03 | L.T. 1. E-03 | L.T. 1. E-03 | L.T. 1. E-03 |
| CO-60 | L.T. 4. E-04 | L.T. 4. E-04 | L.T. 6. E-04 | L.T. 5. E-04 |
| ZN-65 | L.T. 8. E-04 | L.T. 8. E-04 | L.T. 1. E-03 | L.T. 1. E-03 |
| NB-95/ZR-95 | L.T. 4. E-04 | L.T. 5. E-04 | L.T. 5. E-04 | L.T. 6. E-04 |
| RU-103 | L.T. 5. E-04 | L.T. 5. E-04 | L.T. 6. E-04 | L.T. 6. E-04 |
| RU-106 | L.T. 3. E-03 | L.T. 3. E-03 | L.T. 4. E-03 | L.T. 4. E-03 |
| I-131 | L.T. 3. E-03 | L.T. 2. E-03 | L.T. 2. E-03 | L.T. 3. E-03 |
| CS-134 | L.T. 4. E-04 | L.T. 3. E-04 | L.T. 5. E-04 | L.T. 4. E-04 |
| CS-137 | L.T. 4. E-04 | L.T. 3. E-04 | L.T. 5. E-04 | L.T. 5. E-04 |
| LA-140/BA-140 | L.T. 2. E-03 | L.T. 1. E-03 | L.T. 2. E-03 | L.T. 1. E-03 |
| CE-141 | L.T. 7. E-04 | L.T. 7. E-04 | L.T. 9. E-04 | L.T. 1. E-03 |
| CE-144 | L.T. 2. E-03 | L.T. 2. E-03 | L.T. 2. E-03 | L.T. 3. E-03 |
| RA-226 | L.T. 6. E-03 | L.T. 7. E-03 | L.T. 8. E-03 | L.T. 8. E-03 |
| TH-228 | L.T. 5. E-04 | L.T. 7. E-04 | L.T. 8. E-04 | L.T. 7. E-04 |

WOLF CREEK NUCLEAR OPERATING CORP

AIR PARTICULATE FILTERS
EXPOSURE PATHWAY - AIRBORNE

ISOTOPIC ANALYSIS ON QUARTERLY COMPOSITE

( PCI/CU.M. )

STATION NUMBER 37

| DATE COLLECTED | 01/02-04/03 | 04/03-07/03 | 07/03-10/02 | 10/02-01/02 |
|---|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | | |
| BE-7 | 7.12+-0.75E-02 | 1.68+-0.51E-02 | 5.29+-0.53E-02 | 5.53+-0.55E-02 |
| K-40 | L.T. 1. E-02 | 7.95+-3.47E-03 | L.T. 1. E-02 | L.T. 8. E-03 |
| MN-54 | L.T. 5. E-04 | L.T. 5. E-04 | L.T. 4. E-04 | L.T. 3. E-04 |
| CO-58 | L.T. 6. E-04 | L.T. 6. E-04 | L.T. 5. E-04 | L.T. 3. E-04 |
| FE-59 | L.T. 1. E-03 | L.T. 1. E-03 | L.T. 1. E-03 | L.T. 1. E-03 |
| CO-60 | L.T. 5. E-04 | L.T. 5. E-04 | L.T. 5. E-04 | L.T. 5. E-04 |
| ZN-65 | L.T. 1. E-03 | L.T. 1. E-03 | L.T. 1. E-03 | L.T. 8. E-04 |
| NB-95/ZR-95 | L.T. 6. E-04 | L.T. 5. E-04 | L.T. 5. E-04 | L.T. 3. E-04 |
| RU-103 | L.T. 7. E-04 | L.T. 7. E-04 | L.T. 6. E-04 | L.T. 4. E-04 |
| RU-106 | L.T. 4. E-03 | L.T. 4. E-03 | L.T. 4. E-03 | L.T. 3. E-03 |
| I-131 | L.T. 6. E-03 | L.T. 2. E-03 | L.T. 2. E-03 | L.T. 2. E-03 |
| CS-134 | L.T. 5. E-04 | L.T. 5. E-04 | L.T. 5. E-04 | L.T. 4. E-04 |
| CS-137 | L.T. 5. E-04 | L.T. 4. E-04 | L.T. 4. E-04 | L.T. 3. E-04 |
| LA-140/BA-140 | L.T. 3. E-03 | L.T. 2. E-03 | L.T. 1. E-03 | L.T. 1. E-03 |
| CE-141 | L.T. 9. E-04 | L.T. 8. E-04 | L.T. 9. E-04 | L.T. 7. E-04 |
| CE-144 | L.T. 2. E-03 | L.T. 2. E-03 | L.T. 3. E-03 | L.T. 2. E-03 |
| RA-226 | L.T. 7. E-03 | L.T. 7. E-03 | L.T. 8. E-03 | L.T. 6. E-03 |
| TH-228 | L.T. 8. E-04 | L.T. 7. E-04 | L.T. 7. E-04 | L.T. 6. E-04 |

WOLF CREEK NUCLEAR OPERATING CORP

AIR PARTICULATE FILTERS
EXPOSURE PATHWAY - AIRBORNE

ISOTOPIC ANALYSIS ON QUARTERLY COMPOSITE

( PCI/CU.M. )

STATION NUMBER 40

| DATE COLLECTED | 01/02-04/03 | 04/03-07/03 | 07/03-10/02 | 10/02-01/02 |
|---|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | | |
| BE-7 | 4.49+-0.78E-02 | 6.68+-0.67E-02 | 6.07+-0.61E-02 | 5.30+-0.76E-02 |
| K-40 | L.T. 2. E-02 | L.T. 1. E-02 | L.T. 9. E-03 | L.T. 2. E-02 |
| MN-54 | L.T. 7. E-04 | L.T. 5. E-04 | L.T. 4. E-04 | L.T. 6. E-04 |
| CO-58 | L.T. 8. E-04 | L.T. 6. E-04 | L.T. 5. E-04 | L.T. 7. E-04 |
| FE-59 | L.T. 2. E-03 | L.T. 1. E-03 | L.T. 9. E-04 | L.T. 2. E-03 |
| CO-60 | L.T. 8. E-04 | L.T. 5. E-04 | L.T. 5. E-04 | L.T. 6. E-04 |
| ZN-65 | L.T. 2. E-03 | L.T. 1. E-03 | L.T. 8. E-04 | L.T. 1. E-03 |
| NB-95/ZR-95 | L.T. 9. E-04 | L.T. 6. E-04 | L.T. 5. E-04 | L.T. 8. E-04 |
| RU-103 | L.T. 9. E-04 | L.T. 6. E-04 | L.T. 5. E-04 | L.T. 8. E-04 |
| RU-106 | L.T. 6. E-03 | L.T. 4. E-03 | L.T. 3. E-03 | L.T. 5. E-03 |
| I-131 | L.T. 7. E-03 | L.T. 3. E-03 | L.T. 2. E-03 | L.T. 4. E-03 |
| CS-134 | L.T. 7. E-04 | L.T. 5. E-04 | L.T. 4. E-04 | L.T. 7. E-04 |
| CS-137 | L.T. 7. E-04 | L.T. 5. E-04 | L.T. 4. E-04 | L.T. 7. E-04 |
| LA-140/BA-140 | L.T. 3. E-03 | L.T. 2. E-03 | L.T. 1. E-03 | L.T. 3. E-03 |
| CE-141 | L.T. 1. E-03 | L.T. 9. E-04 | L.T. 8. E-04 | L.T. 1. E-03 |
| CE-144 | L.T. 3. E-03 | L.T. 3. E-03 | L.T. 2. E-03 | L.T. 4. E-03 |
| RA-226 | L.T. 1. E-02 | L.T. 7. E-03 | L.T. 7. E-03 | L.T. 1. E-02 |
| TH-228 | L.T. 9. E-04 | L.T. 7. E-04 | L.T. 6. E-04 | L.T. 1. E-03 |

WOLF CREEK NUCLEAR OPERATING CORPORATION

EXPOSURE PATHWAY - AIRBORNE
THERMOLUMINESCENT DOSIMETERS

(net mR/day)

| STATION NUMBER | FIRST QUARTER 01/03/90-04/04/90 | SECOND QUARTER 04/04/90-07/02/90 | THIRD QUARTER 07/02/90-10/03/90 | FOURTH QUARTER 10/03/90-01/03/91 |
|---|---|---|---|---|
| STA-01 | 0.220±0.020 | 0.173±0.013 | 0.182±0.009 | 0.185±0.014 |
| STA-02 | 0.171±0.005 | 0.164±0.008 | 0.160±0.007 | 0.172±0.007 |
| STA-03 | 0.182±0.009 | 0.169±0.007 | 0.164±0.008 | 0.180±0.004 |
| STA-04 | 0.183±0.008 | 0.173±0.008 | 0.202±0.010 | 0.183±0.008 |
| STA-05 | 0.168±0.007 | 0.167±0.003 | 0.166±0.019 | 0.180±0.011 |
| STA-06 | 0.169±0.005 | 0.162±0.007 | 0.167±0.010 | 0.171±0.009 |
| STA-07 | 0.160±0.009 | 0.155±0.009 | 0.158±0.024 | 0.160±0.016 |
| STA-08 | 0.188±0.008 | 0.149±0.034 | 0.179±0.005 | 0.189±0.013 |
| STA-09 | 0.165±0.018 | 0.173±0.018 | 0.162±0.010 | 0.168±0.016 |
| STA-10 | * | 0.178±0.005 | 0.173±0.003 | 0.179±0.011 |
| STA-11 | 0.213±0.038 | 0.194±0.012 | 0.195±0.040 | 0.209±0.019 |
| STA-12 | 0.188±0.018 | 0.174±0.005 | 0.171±0.004 | 0.192±0.005 |
| STA-13 | 0.187±0.002 | 0.180±0.008 | 0.178±0.004 | 0.201±0.004 |
| STA-14 | 0.190±0.019 | 0.179±0.008 | 0.181±0.008 | 0.196±0.002 |
| STA-15 | 0.178±0.011 | 0.178±0.011 | 0.167±0.019 | 0.196±0.012 |
| STA-16 | 0.187±0.013 | 0.193±0.024 | 0.194±0.007 | 0.194±0.011 |
| STA-17 | 0.184±0.037 | 0.172±0.010 | 0.184±0.016 | 0.189±0.013 |
| STA-18 | 0.188±0.007 | 0.193±0.012 | 0.186±0.020 | 0.208±0.011 |
| STA-19 | 0.192±0.009 | 0.184±0.008 | 0.195±0.016 | 0.212±0.023 |
| STA-20 | 0.182±0.007 | 0.175±0.008 | 0.164±0.025 | 0.203±0.010 |
| STA-21 | 0.165±0.002 | 0.152±0.007 | 0.160±0.009 | 0.180±0.013 |
| STA-22 | 0.195±0.018 | 0.166±0.005 | 0.173±0.010 | 0.189±0.037 |
| STA-23 | 0.192±0.005 | 0.169±0.008 | 0.175±0.013 | 0.175±0.018 |
| STA-24 | 0.179±0.007 | 0.173±0.011 | 0.227±0.039 | 0.186±0.015 |

*TLD missing

WOLF CREEK NUCLEAR OPERATING CORPORATION

EXPOSURE PATHWAY - AIRBORNE
THERMOLUMINESCENT DOSIMETERS

(net mR/day)

| STATION NUMBER | FIRST QUARTER 01/03/90-04/04/90 | SECOND QUARTER 04/04/90-07/02/90 | THIRD QUARTER 07/02/90-10/03/90 | FOURTH QUARTER 10/03/90-01/03/91 |
|---|---|---|---|---|
| STA-25 | 0.173±0.049 | 0.130±0.011 | 0.156±0.009 | 0.155±0.008 |
| STA-26 | 0.172±0.021 | 0.152±0.008 | 0.162±0.010 | 0.177±0.011 |
| STA27 | 0.169±0.009 | 0.169±0.011 | 0.180±0.004 | 0.192±0.013 |
| STA-28 | 0.167±0.004 | 0.157±0.005 | 0.144±0.010 | 0.188±0.008 |
| STA-29 | 0.163±0.008 | 0.148±0.019 | 0.163±0.014 | 0.163±0.007 |
| STA-30 | 0.173±0.007 | 0.163±0.012 | 0.175±0.004 | 0.181±0.005 |
| STA-31 | 0.171±0.036 | 0.160±0.004 | 0.174±0.007 | 0.182±0.007 |
| STA-32 | 0.155±0.013 | 0.154±0.008 | 0.158±0.018 | 0.179±0.005 |
| STA-33 | 0.209±0.003 | 0.172±0.008 | 0.192±0.004 | 0.211±0.011 |
| STA-34 | 0.194±0.019 | 0.170±0.014 | 0.180±0.004 | 0.192±0.013 |
| STA-35 | 0.184±0.005 | 0.191±0.004 | 0.181±0.004 | 0.192±0.009 |
| STA-36 | 0.177±0.013 | 0.172±0.007 | 0.184±0.007 | 0.186±0.007 |
| STA-37 | 0.184±0.002 | 0.152±0.011 | 0.167±0.003 | 0.200±0.024 |
| STA-38 | 0.187±0.041 | 0.189±0.011 | 0.192±0.008 | 0.207±0.005 |
| STA-39 | 0.171±0.008 | 0.164±0.012 | 0.179±0.009 | 0.183±0.009 |
| STA-40 | 0.173±0.027 | 0.143±0.003 | 0.144±0.003 | 0.163±0.019 |
| STA-41 | 0.184±0.005 | 0.159±0.007 | 0.168±0.011 | 0.195±0.005 |
| STA-42 | 0.117±0.029 | 0.113±0.003 | 0.112±0.005 | 0.125±0.004 |
| STA-43 | 0.103±0.005 | 0.102±0.009 | 0.100±0.003 | 0.114±0.015 |

WOLF CREEK NUCLEAR OPERATING CORPORATION

EXPOSURE PATHWAY - AIRBORNE
THERMOLUMINESCENT DOSIMETERS

(net mR/day)

| STATION NUMBER | FIRST QUARTER 01/03/90-04/04/90 | SECOND QUARTER 04/04/90-07/02/90 | THIRD QUARTER 07/02/90-10/03/90 | FOURTH QUARTER 10/03/90-01/03/91 |
|---|---|---|---|---|
| STA-01 | 0.179±0.012 | 0.168±0.010 | 0.164±0.009 | 0.182±0.001 |
| STA-02 | 0.160±0.007 | 0.137±0.029 | 0.149±0.004 | 0.171±0.012 |
| STA-03 | 0.175±0.007 | 0.159±0.007 | 0.173±0.015 | 0.169±0.018 |
| STA-04 | 0.218±0.013 | 0.167±0.009 | 0.177±0.032 | 0.171±0.018 |
| STA-05 | 0.174±0.008 | 0.166±0.008 | 0.163±0.012 | 0.168±0.009 |
| STA-06 | 0.178±0.015 | 0.159±0.010 | 0.152±0.014 | 0.154±0.014 |
| STA-07 | 0.179±0.009 | 0.152±0.007 | 0.152±0.009 | 0.161±0.014 |
| STA-08 | 0.197±0.015 | 0.174±0.008 | 0.178±0.022 | 0.191±0.026 |
| STA-09 | 0.214±0.020 | 0.155±0.008 | 0.151±0.002 | 0.184±0.022 |
| STA-10 | 0.198±0.005 | 0.171±0.012 | 0.175±0.008 | 0.182±0.007 |
| STA-11 | 0.212±0.015 | 0.186±0.008 | 0.191±0.013 | 0.204±0.018 |
| STA-12 | 0.207±0.008 | 0.167±0.012 | 0.172±0.018 | 0.182±0.010 |
| STA-13 | 0.200±0.012 | 0.170±0.012 | 0.175±0.011 | 0.185±0.011 |
| STA-14 | 0.191±0.009 | 0.172±0.004 | 0.173±0.012 | 0.182±0.008 |
| STA-15 | 0.192±0.009 | 0.168±0.008 | 0.207±0.005 | 0.171±0.009 |
| STA-16 | * | 0.164±0.008 | 0.197±0.007 | 0.166±0.060 |
| STA-17 | 0.187±0.012 | 0.164±0.007 | 0.130±0.039 | 0.168±0.025 |
| STA-18 | 0.209±0.030 | 0.173±0.014 | 0.185±0.010 | 0.185±0.070 |
| STA-19 | 0.254±0.041 | 0.175±0.012 | 0.182±0.004 | 0.159±0.020 |
| STA-20 | 0.207±0.019 | 0.168±0.005 | 0.173±0.016 | 0.175±0.014 |
| STA-21 | 0.339±0.010** | 0.147±0.014 | 0.151±0.014 | 0.146±0.029 |
| STA-22 | 0.188±0.016 | 0.163±0.008 | 0.172±0.010 | 0.160±0.025 |
| STA-23 | 0.190±0.003 | 0.163±0.007 | 0.169±0.003 | 0.163±0.019 |
| STA-24 | 0.188±0.009 | 0.168±0.008 | 0.191±0.014 | 0.171±0.019 |

* TLD missing
**TLD left in field for two quarters (10/2/89-4/4/90). This result not included in program summary.

WOLF CREEK NUCLEAR OPERATING CORPORATION

EXPOSURE PATHWAY - AIRBORNE
THERMOLUMINESCENT DOSIMETERS

(net mR/day)

| STATION NUMBER | FIRST QUARTER 01/03/90-04/04/90 | SECOND QUARTER 04/04/90-07/02/90 | THIRD QUARTER 07/02/90-10/03/90 | FOURTH QUARTER 10/03/90-01/03/91 |
|---|---|---|---|---|
| STA-25 | 0.166±0.013 | 0.136±0.007 | 0.149±0.044 | 0.132±0.019 |
| STA-26 | 0.175±0.005 | 0.155±0.014 | 0.156±0.008 | 0.152±0.023 |
| STA-27 | 0.189±0.018 | 0.172±0.021 | 0.181±0.008 | 0.173±0.008 |
| STA-28 | 0.180±0.003 | 0.174±0.008 | 0.159±0.016 | 0.145±0.010 |
| STA-29 | 0.157±0.004 | 0.148±0.010 | 0.144±0.002 | 0.147±0.005 |
| STA-30 | 0.174±0.010 | 0.161±0.007 | 0.163±0.003 | 0.151±0.025 |
| STA-31 | 0.182±0.007 | 0.164±0.015 | 0.158±0.044 | 0.168±0.010 |
| STA-32 | 0.176±0.005 | 0.149±0.025 | 0.163±0.007 | 0.166±0.007 |
| STA-33 | 0.188±0.007 | 0.179±0.007 | 0.191±0.009 | 0.178±0.016 |
| STA-34 | 0.196±0.007 | 0.155±0.036 | 0.183±0.014 | 0.166±0.039 |
| STA-35 | 0.203±0.018 | 0.173±0.005 | 0.169±0.024 | 0.173±0.005 |
| STA-36 | 0.179±0.005 | 0.160±0.016 | 0.182±0.010 | 0.175±0.013 |
| STA-37 | 0.173±0.002 | 0.149±0.007 | 0.163±0.002 | 0.169±0.018 |
| STA-38 | 0.197±0.007 | 0.189±0.015 | 0.195±0.009 | 0.179±0.013 |
| STA-39 | 0.183±0.011 | 0.175±0.029 | 0.173±0.011 | 0.173±0.011 |
| STA-40 | 0.172±0.004 | 0.143±0.007 | 0.141±0.019 | 0.158±0.009 |
| STA-41 | 0.191±0.010 | 0.010±0.059 | 0.172±0.005 | 0.182±0.012 |
| STA-42 | 0.121±0.004 | 0.111±0.007 | 0.111±0.007 | 0.124±0.010 |
| STA-43 | 0.117±0.007 | 0.096±0.010 | 0.101±0.004 | 0.107±0.009 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - INGESTION

FEED & FORAGE - CORN

(PCI/GM DRY).

STATION NUMBER M9D2

| | |
|---|---|
| DATE COLLECTED | 09/11 |
| GAMMA SPECTRUM ANALYSIS: | |
| BE-7 | L.T. 5. E-02 |
| K-40 | 3.53+-0.35E 00 |
| MN-54 | L.T. 5. E-03 |
| CO-58 | L.T. 5. E-03 |
| FE-59 | L.T. 1. E-02 |
| CO-60 | L.T. 6. E-03 |
| ZN-65 | L.T. 1. E-02 |
| NB-95/ZR-95 | L.T. 5. E-03 |
| RU-103 | L.T. 6. E-03 |
| RU-106 | L.T. 5. E-02 |
| I-131 | L.T. 1. E-02 |
| CS-134 | L.T. 5. E-03 |
| CS-137 | L.T. 6. E-03 |
| LA-140/BA-140 | L.T. 8. E-03 |
| CE-141 | L.T. 1. E-02 |
| CE-144 | L.T. 4. E-02 |
| RA-226 | L.T. 1. E-01 |
| TH-228 | L.T. 9. E-03 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - INGESTION

FEED & FORAGE - CORN
(PCI/GM DRY)

STATION NUMBER MRU1

| | |
|---|---|
| DATE COLLECTED | 09/13 |
| GAMMA SPECTRUM ANALYSIS: | |
| BE-7 | L.T. 6. E-02 |
| K-40 | 2.58+-0.26E 00 |
| MN-54 | L.T. 6. E-03 |
| CO-58 | L.T. 6. E-03 |
| FE-59 | L.T. 1. E-02 |
| CO-60 | L.T. 7. E-03 |
| ZN-65 | L.T. 2. E-02 |
| NB-95/ZR-95 | L.T. 6. E-03 |
| RU-103 | L.T. 7. E-03 |
| RU-106 | L.T. 6. E-02 |
| I-131 | L.T. 1. E-02 |
| CS-134 | L.T. 7. E-03 |
| CS-137 | L.T. 8. E-03 |
| LA-140/BA-140 | L.T. 1. E-02 |
| CE-141 | L.T. 1. E-02 |
| CE-144 | L.T. 5. E-02 |
| RA-226 | L.T. 1. E-01 |
| TH-228 | L.T. 1. E-02 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - INGESTION

FISH

(PCI/GM WET )

STATION NUMBER JPR

| DATE COLLECTED | 04/24 COMMON CARP | 04/24 LARGEMOUTH BASS | 04/24 CRAPPIE | 10/15 FISH GAME | 10/15 FISH ROUGH |
|---|---|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 1. E-01 | L.T. 1. E-01 |
| K-40 | 5.13+-0.51E 00 | 4.96+-0.50E 00 | 5.93+-0.59E 00 | 4.36+-0.44E 00 | 3.69+-0.37E 00 |
| MN-54 | L.T. 2. E-02 | L.T. 3. E-02 | L.T. 3. E-02 | L.T. 1. E-02 | L.T. 1. E-02 |
| CO-58 | L.T. 3. E-02 | L.T. 2. E-02 | L.T. 3. E-02 | L.T. 1. E-02 | L.T. 1. E-02 |
| FE-59 | L.T. 5. E-02 | L.T. 5. E-02 | L.T. 6. E-02 | L.T. 3. E-02 | L.T. 3. E-02 |
| CO-60 | L.T. 3. E-02 | L.T. 2. E-02 | L.T. 3. E-02 | L.T. 1. E-02 | L.T. 1. E-02 |
| ZN-65 | L.T. 5. E-02 | L.T. 6. E-02 | L.T. 6. E-02 | L.T. 3. E-02 | L.T. 3. E-02 |
| NB-95/ZR-95 | L.T. 3. E-02 | L.T. 3. E-02 | L.T. 3. E-02 | L.T. 2. E-02 | L.T. 1. E-02 |
| RU-103 | L.T. 3. E-02 | L.T. 3. E-02 | L.T. 3. E-02 | L.T. 2. E-02 | L.T. 2. E-02 |
| RU-106 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 1. E-01 | L.T. 1. E-01 |
| I-131 | L.T. 5. E-02 | L.T. 4. E-02 | L.T. 5. E-02 | L.T. 7. E-02 | L.T. 7. E-02 |
| CS-134 | L.T. 3. E-02 | L.T. 3. E-02 | L.T. 3. E-02 | L.T. 1. E-02 | L.T. 1. E-02 |
| CS-137 | L.T. 3. E-02 | L.T. 3. E-02 | L.T. 3. E-02 | L.T. 1. E-02 | L.T. 1. E-02 |
| BA-140/LA-140 | L.T. 3. E-02 | L.T. 4. E-02 | L.T. 4. E-02 | L.T. 4. E-02 | L.T. 3. E-02 |
| CE-141 | L.T. 5. E-02 | L.T. 4. E-02 | L.T. 6. E-02 | L.T. 3. E-02 | L.T. 3. E-02 |
| CE-144 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 1. E-01 | L.T. 9. E-02 |
| RA-226 | L.T. 6. E-01 | L.T. 5. E-01 | L.T. 7. E-01 | L.T. 3. E-01 | L.T. 3. E-01 |
| TH-228 | L.T. 5. E-02 | L.T. 5. E-02 | L.T. 5. E-02 | L.T. 3. E-02 | L.T. 2. E-02 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - INGESTION

FISH

(PCI/GM WET )

STATION NUMBER WCCL

| DATE COLLECTED | 04/04 LARGEMOUTH BASS | 04/04 CRAPPIE | 04/04 COMMON CARP | 10/02 BUFFALO | 10/02 WALLEYE |
|---|---|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 1. E-01 | L.T. 2. E-01 |
| K-40 | 4.26+-0.43E 00 | 4.83+-0.48E 00 | 5.22+-0.52E 00 | 2.91+-0.29E 00 | 3.76+-0.38E 00 |
| MN-54 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 1. E-02 | L.T. 2. E-02 |
| CO-58 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 |
| FE-59 | L.T. 4. E-02 | L.T. 5. E-02 | L.T. 3. E-02 | L.T. 4. E-02 | L.T. 5. E-02 |
| CO-60 | L.T. 2. E-02 | L.T. 3. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 |
| ZN-65 | L.T. 4. E-02 | L.T. 5. E-02 | L.T. 4. E-02 | L.T. 4. E-02 | L.T. 4. E-02 |
| NB-95/ZR-95 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 |
| RU-103 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 |
| RU-106 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 1. E-01 | L.T. 1. E-01 |
| I-131 | L.T. 4. E-02 | L.T. 3. E-02 | L.T. 3. E-02 | L.T. 1. E-01 | L.T. 1. E-01 |
| CS-134 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 1. E-02 | L.T. 2. E-02 |
| CS-137 | L.T. 2. E-02 | L.T. 3. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 |
| LA-140/BA-140 | L.T. 2. E-02 | L.T. 4. E-02 | L.T. 2. E-02 | L.T. 5. E-02 | L.T. 7. E-02 |
| CE-141 | L.T. 4. E-02 | L.T. 4. E-02 | L.T. 4. E-02 | L.T. 4. E-02 | L.T. 4. E-02 |
| CE-144 | L.T. 1. E-01 | L.T. 2. E-01 | L.T. 1. E-01 | L.T. 1. E-01 | L.T. 1. E-01 |
| PA-226 | L.T. 4. E-01 | L.T. 5. E-01 | L.T. 4. E-01 | L.T. 3. E-01 | L.T. 3. E-01 |
| TH-228 | L.T. 4. E-02 | L.T. 5. E-02 | L.T. 4. E-02 | L.T. 3. E-02 | L.T. 3. E-02 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - INGESTION

FISH

(PCI/GM WET )

STATION NUMBER WCC1

| DATE COLLECTED | 10/02 WIPER | 10/02 CATFISH | 10/02 WALLEYE |
|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | |
| BE-7 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 2. E-01 (A) |
| K-40 | 3.88+-0.39E 00 | 3.46+-0.35E 00 | 3.56+-0.36E 00 |
| MN-54 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 |
| CO-58 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 |
| FE-59 | L.T. 6. E-02 | L.T. 6. E-02 | L.T. 6. E-02 |
| CO-60 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 |
| ZN-65 | L.T. 5. E-02 | L.T. 5. E-02 | L.T. 6. E-02 |
| NB-95/ZR-95 | L.T. 3. E-02 | L.T. 3. E-02 | L.T. 3. E-02 |
| RU-103 | L.T. 3. E-02 | L.T. 3. E-02 | L.T. 3. E-02 |
| RU-106 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 2. E-01 |
| I-131 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 2. E-01 |
| CS-134 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 |
| CS-137 | L.T. 2. E-02 | 4.04+-1.61E-02 | L.T. 2. E-02 |
| BA-140/LA-140 | L.T. 7. E-02 | L.T. 7. E-02 | L.T. 6. E-02 |
| CE-141 | L.T. 6. E-02 | L.T. 6. E-02 | L.T. 6. E-02 |
| CE-144 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 2. E-01 |
| RA-226 | L.T. 4. E-01 | L.T. 4. E-01 | L.T. 5. E-01 |
| TH-228 | L.T. 4. E-02 | L.T. 4. E-02 | L.T. 4. E-02 |

(A) DUPLICATE ANALYSIS

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - INGESTION

FOOD/GARDEN CROPS

(PCI/GM WET )

STATION NUMBER A-1

| DATE COLLECTED | 06/26 SWISS CHARD | 07/24 SWISS CHARD | 08/28 SWISS CHARD | 09/25 SWISS CHARD | 10/25 SWISS CHARD |
|---|---|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | 4.44+-1.02E-01 | L.T. 2. E-01 | 3.94+-1.73E-01 | 4.28+-1.31E-01 | 3.19+-1.10E-01 |
| K-40 | 6.28+-0.61E 00 | 2.03+-0.21E 00 | 2.24+-0.30E 00 | 2.34+-0.23E 00 | 4.56+-0.46E 00 |
| MN-54 | L.T. 1. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 1. E-02 | L.T. 1. E-02 |
| CO-58 | L.T. 1. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 1. E-02 | L.T. 1. E-02 |
| FE-59 | L.T. 3. E-02 | L.T. 4. E-02 | L.T. 5. E-02 | L.T. 3. E-02 | L.T. 3. E-02 |
| CO-60 | L.T. 1. E-02 | L.T. 2. E-02 | L.T. 3. E-02 | L.T. 1. E-02 | L.T. 1. E-02 |
| ZN-65 | L.T. 3. E-02 | L.T. 4. E-02 | L.T. 6. E-02 | L.T. 3. E-02 | L.T. 3. E-02 |
| NB-95/ZR-95 | L.T. 1. E-02 | L.T. 2. E-02 | L.T. 3. E-02 | L.T. 1. E-02 | L.T. 1. E-02 |
| RU-103 | L.T. 1. E-02 | L.T. 2. E-02 | L.T. 3. E-02 | L.T. 2. E-02 | L.T. 2. E-02 |
| RU-106 | L.T. 1. E-01 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 1. E-01 | L.T. 1. E-01 |
| I-131 | L.T. 3. E-02 | L.T. 4. E-02 | L.T. 6. E-02 | L.T. 4. E-02 | L.T. 4. E-02 |
| CS-134 | L.T. 1. E-02 | L.T. 2. E-02 | L.T. 3. E-02 | L.T. 2. E-02 | L.T. 1. E-02 |
| CS-137 | L.T. 1. E-02 | L.T. 2. E-02 | L.T. 3. E-02 | L.T. 2. E-02 | L.T. 1. E-02 |
| LA-140/BA-140 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 4. E-02 | L.T. 3. E-02 | L.T. 2. E-02 |
| CE-141 | L.T. 3. E-02 | L.T. 4. E-02 | L.T. 5. E-02 | L.T. 3. E-02 | L.T. 3. E-02 |
| CE-144 | L.T. 1. E-01 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 1. E-01 | L.T. 1. E-01 |
| RA-226 | L.T. 3. E-01 | L.T. 4. E-01 | L.T. 5. E-01 | L.T. 3. E-01 | L.T. 3. E-01 |
| TH-228 | L.T. 2. E-02 | L.T. 4. E-02 | L.T. 4. E-02 | L.T. 3. E-02 | L.T. 2. E-02 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - INGESTION

FOOD/GARDEN CROPS

(PCI/GM WET )

STATION NUMBER G-1

| DATE COLLECTED | 06/26 CABBAGE | 07/24 CABBAGE | 10/25 TURNIP GREENS | 11/27 BL VEGETABLE |
|---|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | | |
| BE-7 | 3.37+-0.80E-01 | L.T. 1. E-01 | 2.69+-0.96E-01 | 3.14+-0.78E-01 |
| K-40 | 3.84+-0.38E 00 | 3.72+-0.37E 00 | 4.79+-0.48E 00 | 3.45+-0.34E 00 |
| MN-54 | L.T. 8. E-03 | L.T. 1. E-02 | L.T. 1. E-02 | L.T. 8. E-03 |
| CO-58 | L.T. 1. E-02 | L.T. 1. E-02 | L.T. 1. E-02 | L.T. 9. E-03 |
| FE-59 | L.T. 2. E-02 | L.T. 3. E-02 | L.T. 3. E-02 | L.T. 2. E-02 |
| CO-60 | L.T. 1. E-02 | L.T. 2. E-02 | L.T. 1. E-02 | L.T. 1. E-02 |
| ZN-65 | L.T. 2. E-02 | L.T. 3. E-02 | L.T. 3. E-02 | L.T. 2. E-02 |
| NB-95/ZR-95 | L.T. 1. E-02 | L.T. 1. E-02 | L.T. 1. E-02 | L.T. 9. E-03 |
| RU-103 | L.T. 1. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 1. E-02 |
| RU-106 | L.T. 9. E-02 | L.T. 1. E-01 | L.T. 1. E-01 | L.T. 7. E-02 |
| I-131 | L.T. 2. E-02 | L.T. 3. E-02 | L.T. 4. E-02 | L.T. 3. E-02 |
| CS-134 | L.T. 1. E-02 | L.T. 1. E-02 | L.T. 1. E-02 | L.T. 9. E-03 |
| CS-137 | L.T. 1. E-02 | L.T. 1. E-02 | L.T. 1. E-02 | L.T. 8. E-03 |
| BA-140/LA-140 | L.T. 1. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 |
| CE-141 | L.T. 2. E-02 | L.T. 3. E-02 | L.T. 3. E-02 | L.T. 2. E-02 |
| CE-144 | L.T. 7. E-02 | L.T. 1. E-01 | L.T. 1. E-01 | L.T. 7. E-02 |
| RA-226 | L.T. 2. E-01 | L.T. 3. E-01 | L.T. 3. E-01 | L.T. 2. E-01 |
| TH-228 | L.T. 2. E-02 | L.T. 3. E-02 | L.T. 2. E-02 | L.T. 2. E-02 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - INGESTION

FOOD/GARDEN CROPS

(PCI/GM WET )

STATION NUMBER R-1

| DATE COLLECTED | 05/22 LETTUCE | 06/26 LETTUCE | 06/26 LETTUCE | 07/24 LETTUCE | 09/28 LETTUCE |
|---|---|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | 5.53+-0.80E-01 | 3.65+-0.94E-01 | 4.74+-0.74E-01(A) | 2.50+-1.41E-01 | L.T. 8. E-01 |
| K-40 | 3.74+-0.37E 00 | 3.18+-0.32E 00 | 2.51+-0.25E 00 | 6.32+-0.63E 00 | 5.65+-0.92E 00 |
| MN-54 | L.T. 8. E-03 | L.T. 1. E-02 | L.T. 8. E-03 | L.T. 2. E-02 | L.T. 7. E-02 |
| CO-58 | L.T. 9. E-03 | L.T. 9. E-03 | L.T. 9. E-03 | L.T. 2. E-02 | L.T. 7. E-02 |
| FE-59 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 4. E-02 | L.T. 2. E-01 |
| CO-60 | L.T. 9. E-03 | L.T. 1. E-02 | L.T. 9. E-03 | L.T. 2. E-02 | L.T. 8. E-02 |
| ZN-65 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 5. E-02 | L.T. 2. E-01 |
| NB-95/ZR-95 | L.T. 1. E-02 | L.T. 1. E-02 | L.T. 9. E-03 | L.T. 2. E-02 | L.T. 8. E-02 |
| RU-103 | L.T. 1. E-02 | L.T. 1. E-02 | L.T. 1. E-02 | L.T. 2. E-02 | L.T. 1. E-01 |
| RU-106 | L.T. 8. E-02 | L.T. 9. E-02 | L.T. 8. E-02 | L.T. 2. E-01 | L.T. 7. E-01 |
| I-131 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 4. E-02 | L.T. 2. E-01 |
| CS-134 | L.T. 1. E-02 | L.T. 1. E-02 | L.T. 9. E-03 | L.T. 2. E-02 | L.T. 8. E-02 |
| CS-137 | 1.75+-0.81E-02 | L.T. 1. E-02 | L.T. 1. E-02 | L.T. 2. E-02 | L.T. 8. E-02 |
| LA-140/BA-140 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 1. E-02 | L.T. 3. E-02 | L.T. 1. E-01 |
| CE-141 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 4. E-02 | L.T. 2. E-01 |
| CE-144 | L.T. 6. E-02 | L.T. 8. E-02 | L.T. 8. E-02 | L.T. 1. E-01 | L.T. 6. E-01 |
| RA-226 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 4. E-01 | L.T. 2. E 00 |
| TH-228 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 4. E-02 | L.T. 2. E-01 |

(A) DUPLICATE ANALYSIS

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - INGESTION

FOOD/GARDEN CROPS

(PCI/GM WET )

STATION NUMBER S-4

| | |
|---|---|
| DATE COLLECTED | 05/22 |
| | LETTUCE |
| GAMMA SPECTRUM ANALYSIS: | |
| BE-7 | 4.79+-1.07E-01 |
| K-40 | 4.60+-0.46E 00 |
| MN-54 | L.T. 1. E-02 |
| CO-58 | L.T. 1. E-02 |
| FE-59 | L.T. 3. E-02 |
| CO-60 | L.T. 1. E-02 |
| ZN-65 | L.T. 3. E-02 |
| NB-95/ZR-95 | L.T. 1. E-02 |
| RU-103 | L.T. 1. E-02 |
| RU-106 | L.T. 1. E-01 |
| I-131 | L.T. 3. E-02 |
| CS-134 | L.T. 1. E-02 |
| CS-137 | 3.23+-1.21E-02 |
| LA-140/BA-140 | L.T. 2. E-02 |
| CE-141 | L.T. 3. E-02 |
| CE-144 | L.T. 1. E-01 |
| RA-226 | 4.04+-2.19E-01 |
| TH-228 | 1.08+-0.13E-01 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - INGESTION

FOOD/GARDEN CROPS

(PCI/GM WET )

STATION NUMBER S-4

| DATE COLLECTED | 06/26 CABBAGE | 07/24 CABBAGE | 09/28 CABBAGE |
|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | |
| BE-7 | 7.71+-1.43E-01 | 3.89+-1.17E-01 | 4.80+-1.65E-01 |
| K-40 | 3.60+-0.36E 00 | 4.20+-0.42E 00 | 2.90+-0.30E 00 |
| MN-54 | L.T. 2. E-02 | L.T. 1. E-02 | L.T. 2. E-02 |
| CO-58 | L.T. 2. E-02 | L.T. 1. E-02 | L.T. 2. E-02 |
| FE-59 | L.T. 4. E-02 | L.T. 3. E-02 | L.T. 4. E-02 |
| CO-60 | L.T. 2. E-02 | L.T. 1. E-02 | L.T. 2. E-02 |
| ZN-65 | L.T. 4. E-02 | L.T. 3. E-02 | L.T. 4. E-02 |
| NB-95/ZR-95 | L.T. 2. E-02 | L.T. 1. E-02 | L.T. 2. E-02 |
| RU-103 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 |
| RU-106 | L.T. 1. E-01 | L.T. 1. E-01 | L.T. 1. E-01 |
| I-131 | L.T. 4. E-02 | L.T. 3. E-02 | L.T. 4. E-02 |
| CS-134 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 |
| CS-137 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 2. E-02 |
| LA-140/BA-140 | L.T. 2. E-02 | L.T. 2. E-02 | L.T. 3. E-02 |
| CE-141 | L.T. 4. E-02 | L.T. 3. E-02 | L.T. 4. E-02 |
| CE-144 | L.T. 1. E-01 | L.T. 1. E-01 | L.T. 1. E-01 |
| RA-226 | L.T. 4. E-01 | L.T. 3. E-01 | L.T. 4. E-01 |
| TH-228 | L.T. 3. E-02 | L.T. 3. E-02 | L.T. 3. E-02 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - INGESTION

MILK

( PCI/LITER )

STATION NUMBER S-3

| DATE COLLECTED | 01/09 | 02/13 | 03/14 | 04/10 | 04/24 |
|---|---|---|---|---|---|
| RADIOCHEMICAL ANALYSIS: | | | | | |
| I-131 | L.T. 3. E-01 | L.T. 2. E-01 | L.T. 3. E-01 | L.T. 2. E-01 | L.T. 2. E-01 |
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 4. E 01 | L.T. 3. E 01 |
| K-40 | 1.28+-0.13E 03 | 1.30+-0.13E 03 | 1.18+-0.12E 03 | 1.33+-0.13E 03 | 1.31+-0.13E 03 |
| MN-54 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 5. E 00 | L.T. 4. E 00 |
| CO-58 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| FE-59 | L.T. 9. E 00 | L.T. 9. E 00 | L.T. 9. E 00 | L.T. 1. E 01 | L.T. 8. E 00 |
| CO-60 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 6. E 00 | L.T. 4. E 00 |
| ZN-65 | L.T. 9. E 00 | L.T. 9. E 00 | L.T. 9. E 00 | L.T. 1. E 01 | L.T. 8. E 00 |
| NB-95/ZR-95 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 5. E 00 | L.T. 4. E 00 |
| RU-103 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 5. E 00 | L.T. 4. E 00 |
| RU-106 | L.T. 4. E 01 | L.T. 3. E 01 | L.T. 4. E 01 | L.T. 4. E 01 | L.T. 3. E 01 |
| I-131 | L.T. 7. E 00 | L.T. 9. E 00 | L.T. 8. E 00 | L.T. 8. E 00 | L.T. 6. E 00 |
| CS-134 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 5. E 00 | L.T. 4. E 00 |
| CS-137 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 6. E 00 | L.T. 4. E 00 |
| LA-140/BA-140 | L.T. 5. E 00 | L.T. 6. E 00 | L.T. 5. E 00 | L.T. 7. E 00 | L.T. 5. E 00 |
| CE-141 | L.T. 8. E 00 | L.T. 7. E 00 | L.T. 9. E 00 | L.T. 9. E 00 | L.T. 8. E 00 |
| CE-144 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 4. E 01 | L.T. 4. E 01 | L.T. 3. E 01 |
| RA-226 | L.T. 9. E 01 | L.T. 8. E 01 | L.T. 1. E 02 | L.T. 9. E 01 | L.T. 9. E 01 |
| TH-228 | L.T. 7. E 00 | L.T. 7. E 00 | L.T. 8. E 00 | L.T. 1. E 01 | L.T. 7. E 00 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - INGESTION

MILK

( PCI/LITER )

STATION NUMBER 5-3

| DATE COLLECTED | 05/08 | 05/23 | 06/12 | 06/28 | 07/10 |
|---|---|---|---|---|---|
| RADIOCHEMICAL ANALYSIS: | | | | | |
| I-131 | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 3. E-01 | L.T. 2. E-01 | L.T. 2. E-01 |
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 5. E 01 | L.T. 4. E 01 | L.T. 3. E 01 |
| K-40 | 1.32+-0.13E 03 | 1.24+-0.12E 03 | 9.17+-0.92E 02 | 1.15+-0.11E 03 | 1.28+-0.12E 03 |
| MN-54 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. [illegible] E 00 | L.T. 4. E 00 | L.T. 3. E 00 |
| CO-58 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 6. E 00 | L.T. 4. E 00 | L.T. 3. E 00 |
| FE-59 | L.T. 8. E 00 | L.T. 9. E 00 | L.T. 1. E 01 | L.T. 9. E 00 | L.T. 8. E 00 |
| CO-60 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 6. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| ZN-65 | L.T. 9. E 00 | L.T. 9. E 00 | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 8. E 00 |
| NB-95/ZR-95 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 6. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| RU-103 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 6. E 00 | L.T. 4. E 00 | L.T. 3. E 00 |
| RU-106 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 5. E 01 | L.T. 4. E 01 | L.T. 3. E 01 |
| I-131 | L.T. 4. E 00 | L.T. 6. E 00 | L.T. 1. E 01 | L.T. 8. E 00 | L.T. 5. E 00 |
| CS-134 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 6. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| CS-137 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 6. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| LA-140/BA-140 | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 8. E 00 | L.T. 6. E 00 | L.T. 4. E 00 |
| CE-141 | L.T. 5. E 00 | L.T. 6. E 00 | L.T. 1. E 01 | L.T. 8. E 00 | L.T. 7. E 00 |
| CE-144 | L.T. 2. E 01 | L.T. 2. E 01 | L.T. 4. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| RA-226 | L.T. 7. E 01 | L.T. 7. E 01 | L.T. 1. E 02 | L.T. 9. E 01 | L.T. 8. E 01 |
| TH-228 | L.T. 6. E 00 | L.T. 6. E 00 | L.T. 1. E 01 | L.T. 8. E 00 | L.T. 6. E 00 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - INGESTION

MILK

( PCI/LITER )

STATION NUMBER S-3

| DATE COLLECTED | 07/24 | 08/14 | 08/28 | 09/11 | 09/25 |
|---|---|---|---|---|---|
| RADIOCHEMICAL ANALYSIS: | | | | | |
| I-131 | L.T. 1. E-01 | L.T. 1. E-01 | L.T. 1. E-01 | L.T. 2. E-01 | L.T. 1. E-01 |
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | L.T. 4. E 01 | L.T. 4. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| K-40 | 1.25+-0.12E 03 | 1.28+-0.13E 03 | 1.22+-0.12E 03 | 1.34+-0.13E 03 | 1.34+-0.13E 03 |
| MN-54 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 4. E 00 |
| CO-58 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 3. E 00 |
| FE-59 | L.T. 9. E 00 | L.T. 1. E 01 | L.T. 9. E 00 | L.T. 8. E 00 | L.T. 9. E 00 |
| CO-60 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| ZN-65 | L.T. 9. E 00 | L.T. 1. E 01 | L.T. 9. E 00 | L.T. 9. E 00 | L.T. 9. E 00 |
| NB-95/ZR-95 | L.T. 4. E 00 | L.T. 5. E 00 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| RU-103 | L.T. 4. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| RU-106 | L.T. 4. E 01 | L.T. 4. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| I-131 | L.T. 7. E 00 | L.T. 1. E 01 | L.T. 9. E 00 | L.T. 6. E 00 | L.T. 6. E 00 |
| CS-134 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| CS-137 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| LA-140/BA-140 | L.T. 6. E 00 | L.T. 8. E 00 | L.T. 6. E 00 | L.T. 5. E 00 | L.T. 5. E 00 |
| CE-141 | L.T. 8. E 00 | L.T. 1. E 01 | L.T. 8. E 00 | L.T. 6. E 00 | L.T. 7. E 00 |
| CE-144 | L.T. 3. E 01 | L.T. 4. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| RA-226 | L.T. 9. E 01 | L.T. 1. E 02 | L.T. 8. E 01 | L.T. 7. E 01 | L.T. 7. E 01 |
| TH-228 | L.T. 7. E 00 | L.T. 8. E 00 | L.T. 7. E 00 | L.T. 6. E 00 | L.T. 7. E 00 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - INGESTION

MILK

( PCI/LITER )

STATION NUMBER S-3

| DATE COLLECTED | 10/09 | 10/23 | 11/13 | 11/27 | 12/11 |
|---|---|---|---|---|---|
| RADIOCHEMICAL ANALYSIS* | | | | | |
| E-131 | L.T. 2. E-01 | L.T. 3. E-01 | L.T. 1. E-01 | L.T. 2. E-01 | L.T. 1. E-01 |
| GAMMA SPECTRUM ANALYSIS* | | | | | |
| BE-7 | L.T. 4. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| K-40 | 1.29+-0.13E 03 | 1.41+-0.14E 03 | 1.31+-0.13E 03 | 1.26+-0.13E 03 | 1.35+-0.13E 03 |
| MN-54 | L.T. 5. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 4. E 00 |
| CO-58 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| FE-59 | L.T. 1. E 01 | L.T. 8. E 00 | L.T. 8. E 00 | L.T. 9. E 00 | L.T. 9. E 00 |
| CO-60 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| ZN-65 | L.T. 1. E 01 | L.T. 8. E 00 | L.T. 8. E 00 | L.T. 9. E 00 | L.T. 9. E 00 |
| NB-95/ZR-95 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| RU-103 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| RU-106 | L.T. 4. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| I-131 | L.T. 9. E 00 | L.T. 7. E 00 | L.T. 6. E 00 | L.T. 7. E 00 | L.T. 6. E 00 |
| CS-134 | L.T. 6. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| CS-137 | L.T. 6. E 00 | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| LA-140/BA-140 | L.T. 8. E 00 | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 6. E 00 | L.T. 5. E 00 |
| CE-141 | L.T. 9. E 00 | L.T. 7. E 00 | L.T. 6. E 00 | L.T. 6. E 00 | L.T. 6. E 00 |
| CE-144 | L.T. 4. E 01 | L.T. 2. E 01 | L.T. 2. E 01 | L.T. 2. E 01 | L.T. 3. E 01 |
| RA-226 | L.T. 1. E 02 | L.T. 8. E 01 | L.T. 8. E 01 | L.T. 7. E 01 | L.T. 7. E 01 |
| TH-228 | L.T. 1. E 01 | L.T. 7. E 00 | L.T. 7. E 00 | L.T. 7. E 00 | L.T. 7. E 00 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AQUATIC

SHORELINE SOIL

(PCI/GM DRY)

STATION NUMBER DC

| DATE COLLECTED | 04/17 | 10/16 |
|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | |
| BE-7 | L.T. 3. E-01 | L.T. 3. E-01 |
| K-40 | 9.96+-1.00E 00 | 1.05+-0.11E 01 |
| MN-54 | L.T. 3. E-02 | L.T. 3. E-02 |
| CO-58 | L.T. 3. E-02 | L.T. 4. E-02 |
| FE-59 | L.T. 7. E-02 | L.T. 9. E-02 |
| CO-60 | 1.77+-0.29E-01 | 1.51+-0.27E-01 |
| ZN-65 | L.T. 6. E-02 | L.T. 6. E-02 |
| NB-95/ZR-95 | L.T. 4. E-02 | L.T. 4. E-02 |
| RU-103 | L.T. 3. E-02 | L.T. 4. E-02 |
| RU-106 | L.T. 3. E-01 | L.T. 3. E-01 |
| I-131 | L.T. 9. E-02 | L.T. 3. E-01 |
| CS-134 | L.T. 4. E-02 | L.T. 4. E-02 |
| CS-137 | L.T. 4. E-02 | 9.58+-2.82E-02 |
| BA-140/RA-140 | L.T. 7. E-02 | L.T. 2. E-01 |
| CE-141 | L.T. 6. E-02 | L.T. 8. E-02 |
| CE-144 | L.T. 2. E-01 | L.T. 2. E-01 |
| RA-226 | 1.58+-0.51E 00 | 2.13+-0.47E 00 |
| TH-228 | 2.36+-0.11E 00 | 1.33+-0.11E 00 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AQUATIC

SHORELINE SOIL

(PCI/GM DRY)

STATION NUMBER JRR

| | |
|---|---|
| DATE COLLECTED | 10/15 |
| GAMMA SPECTRUM ANALYSIS: | |
| BE-7 | L.T. 4. E-01 |
| K-40 | 1.07+-0.11E 01 |
| MN-54 | L.T. 4. E-02 |
| CO-58 | L.T. 5. E-02 |
| FE-59 | L.T. 1. E-01 |
| CO-60 | L.T. 4. E-02 |
| ZN-65 | L.T. 1. E-01 |
| NB-95/ZR-95 | L.T. 5. E-02 |
| RU-103 | L.T. 5. E-02 |
| RU-106 | L.T. 4. E-01 |
| I-131 | L.T. 2. E-01 |
| CS-134 | L.T. 5. E-02 |
| CS-137 | L.T. 4. E-02 |
| LA-140/BA-140 | L.T. 1. E-01 |
| CE-141 | L.T. 1. E-01 |
| CE-144 | L.T. 1. E-01 |
| RA-226 | 1.96+-0.73E 00 |
| TH-228 | 1.40+-0.14E 00 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AQUATIC

SEDIMENT/SILT

(PCI/GM DRY )

STATION NUMBER DC

| DATE COLLECTED | 06/26 | 09/25 |
|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | |
| BE-7 | L.T. 4. E-01 | L.T. 5. E-01 |
| K-40 | 1.22+-0.12E 01 | 1.13+-0.11E 01 |
| MN-54 | L.T. 5. E-02 | L.T. 5. E-02 |
| CO-58 | 6.86+-4.02E-02 | L.T. 5. E-02 |
| FE-59 | L.T. 1. E-01 | L.T. 1. E-01 |
| CO-60 | 3.45+-0.54E-01 | 2.53+-0.49E-01 |
| ZN-65 | L.T. 1. E-01 | L.T. 9. E-02 |
| NB-95/ZR-95 | L.T. 6. E-02 | L.T. 5. E-02 |
| RU-103 | L.T. 8. E-02 | L.T. 6. E-02 |
| RU-106 | L.T. 4. E-01 | L.T. 3. E-01 |
| I-131 | L.T. 2. E-01 | L.T. 3. E-01 |
| CS-134 | L.T. 5. E-02 | L.T. 6. E-02 |
| CS-137 | 4.11+-0.47E-01 | 2.80+-0.34E-01 |
| LA-140/BA-140 | L.T. 1. E-01 | L.T. 2. E-01 |
| CE-141 | L.T. 7. E-02 | L.T. 1. E-01 |
| CE-144 | L.T. 2. E-01 | L.T. 4. E-01 |
| RA-226 | 1.57+-0.55E 00 | 1.37+-0.75E 00 |
| TH-228 | 1.32+-0.13E 00 | 1.12+-0.11E 00 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AQUATIC

SEDIMENT/SILT

(PCI/GM DRY )

STATION NUMBER UHSC

| | |
|---|---|
| DATE COLLECTED | 06/27 |
| GAMMA SPECTRUM ANALYSIS: | |
| BE-7 | L.T. 3. E-01 |
| K-40 | 1.25+-0.13E 01 |
| MN-54 | L.T. 3. E-02 |
| CO-58 | L.T. 3. E-02 |
| FE-59 | L.T. 7. E-02 |
| CO-60 | 8.02+-2.66E-02 |
| ZN-65 | L.T. 6. E-02 |
| NB-95/ZR-95 | L.T. 3. E-02 |
| RU-103 | L.T. 3. E-02 |
| RU-106 | L.T. 2. E-01 |
| I-131 | L.T. 1. E-01 |
| CS-134 | L.T. 3. E-02 |
| CS-137 | 3.11+-0.31E-01 |
| LA-140/BA-140 | L.T. 9. E-02 |
| CE-141 | L.T. 6. E-02 |
| CE-144 | L.T. 2. E-01 |
| RA-226 | 2.05+-0.36E 00 |
| TH-228 | 1.11+-0.11E 00 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AQUATIC

SEDIMENT/SILT

(PCI/GM DRY )

STATION NUMBER UHSD

| | |
|---|---|
| DATE COLLECTED | 06/27 |
| GAMMA SPECTRUM ANALYSIS: | |
| BE-7 | L.T. 4. E-01 |
| K-40 | 1.23+-0.12E 01 |
| MN-54 | L.T. 4. E-02 |
| CO-58 | L.T. 4. E-02 |
| FE-59 | L.T. 9. E-02 |
| CO-60 | 7.28+-3.23E-02 |
| ZN-65 | L.T. 8. E-02 |
| NB-95/ZR-95 | L.T. 5. E-02 |
| RU-103 | L.T. 5. E-02 |
| RU-106 | L.T. 3. E-01 |
| I-131 | L.T. 2. E-01 |
| CS-134 | L.T. 4. E-02 |
| CS-137 | 5.55+-0.56E-01 |
| LA-140/BA-140 | L.T. 1. E-01 |
| CE-141 | L.T. 8. E-02 |
| CE-144 | L.T. 2. E-01 |
| RA-226 | 2.66+-0.60E 00 |
| TH-228 | 1.51+-3.15E 00 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AQUATIC

SEDIMENT/SILT

(PCI/GM DRY)

STATION NUMBER JRR

| | |
|---|---|
| DATE COLLECTED | 10/01 |
| GAMMA SPECTRUM ANALYSIS: | |
| BE-7 | L.T. 2. E-01 |
| K-40 | 1.47+-0.15E 01 |
| MN-54 | L.T. 2. E-02 |
| CO-58 | L.T. 2. E-02 |
| FE-59 | L.T. 7. E-02 |
| CO-60 | L.T. 2. E-02 |
| ZN-65 | L.T. 5. E-02 |
| NB-95/ZR-95 | L.T. 3. E-02 |
| RU-103 | L.T. 3. E-02 |
| RU-106 | L.T. 2. E-01 |
| I-131 | L.T. 2. E-01 |
| CS-134 | L.T. 3. E-02 |
| CS-137 | 1.88+-0.19E-01 |
| LA-140/PR-140 | L.T. 9. E-02 |
| CE-141 | L.T. 6. E-02 |
| CE-144 | L.T. 2. E-01 |
| RA-226 | 1.82+-0.37E 00 |
| TH-228 | 1.46+-0.15E 00 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - AQUATIC

VEGETATION - AQUATIC

(PCI/GM WET )

STATION NUMBER 0C

| DATE COLLECTED | 06/26 | 09/18 |
|---|---|---|
| | ALGAE | ALGAE |
| GAMMA SPECTRUM ANALYSIS | | |
| BE-7 | 1.13+-0.11E 00 | 7.50+-0.88E-01 |
| K-40 | 1.85+-0.18E 00 | 1.88+-0.19E 00 |
| MN-54 | L.T. 7. E-03 | 1.21+-0.53E-02 |
| CO-58 | 4.44+-0.83E-02 | 4.33+-0.72E-02 |
| FE-59 | L.T. 2. E-02 | L.T. 2. E-02 |
| CO-60 | 4.88+-0.86E-02 | 1.18+-0.12E-01 |
| ZN-65 | L.T. 1. E-02 | L.T. 1. E-02 |
| NB-95/ZR-95 | L.T. 8. E-03 | L.T. 8. E-03 |
| RU-103 | L.T. 9. E-03 | L.T. 9. E-03 |
| RU-106 | L.T. 6. E-02 | L.T. 6. E-02 |
| I-131 | L.T. 3. E-02 | L.T. 4. E-02 |
| CS-134 | L.T. 8. E-03 | 4.16+-0.71E-02 |
| CS-137 | 5.89+-0.80E-02 | 1.13+-0.11E-01 |
| LA-140/BA-140 | L.T. 2. E-02 | L.T. 2. E-02 |
| CE-141 | L.T. 2. E-02 | L.T. 2. E-02 |
| CE-144 | L.T. 6. E-02 | L.T. 6. E-02 |
| RA-226 | 2.15+-1.25E-01 | 4.50+-1.19E-01 |
| TH-228 | 1.19+-0.12E-01 | 2.01+-0.20E-01 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

DRINKING WATER

( PCI/LITER )

STATION NUMBER BW1S

| DATE COLLECTED | 01/02-02/06 | 01/02-04/03 | 02/06-03/06 | 03/06-04/03 | 04/03-05/01 |
|---|---|---|---|---|---|
| RADIOCHEMICAL ANALYSIS: | | | | | |
| GR-B | 7.1 +-1.3 E 00 | NR | 8.3 +-1.6 E 00 | 6.5 +-1.3 E 00 | 6.0 +-1.4 E 00 |
| I-131 | L.T. 4. E-01 | NR | L.T. 1. E-01 | L.T. 1. E-01 | L.T. 1. E-01 |
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | L.T. 5. E 01 | NR | L.T. 4. E 01 | L.T. 3. E 01 | L.T. 4. E 01 |
| K-40 | L.T. 9. E 01 | NR | L.T. 8. E 01 | L.T. 6. E 01 | L.T. 8. E 01 |
| MN-54 | L.T. 5. E 00 | NR | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 4. E 00 |
| CO-58 | L.T. 4. E 00 | NR | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 4. E 00 |
| FE-59 | L.T. 9. E 00 | NR | L.T. 8. E 00 | L.T. 6. E 00 | L.T. 8. E 00 |
| CO-60 | L.T. 6. E 00 | NR | L.T. 5. E 00 | L.T. 3. E 00 | L.T. 5. E 00 |
| ZN-65 | L.T. 1. E 01 | NR | L.T. 9. E 00 | L.T. 7. E 00 | L.T. 8. E 00 |
| NB-95/ZR-95 | L.T. 5. E 00 | NR | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 4. E 00 |
| RU-103 | L.T. 6. E 00 | NR | L.T. 5. E 00 | L.T. 3. E 00 | L.T. 5. E 00 |
| RU-106 | L.T. 5. E 01 | NR | L.T. 4. E 01 | L.T. 3. E 01 | L.T. 4. E 01 |
| I-131 | L.T. 9. E 00 | NR | L.T. 6. E 00 | L.T. 5. E 00 | L.T. 6. E 00 |
| CS-134 | L.T. 5. E 00 | NR | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 5. E 00 |
| CS-137 | L.T. 6. E 00 | NR | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 5. E 00 |
| LA-140/BA-140 | L.T. 7. E 00 | NR | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 5. E 00 |
| CE-141 | L.T. 1. E 01 | NR | L.T. 8. E 00 | L.T. 7. E 00 | L.T. 8. E 00 |
| CE-144 | L.T. 4. E 01 | NR | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| RA-226 | L.T. 1. E 02 | NR | L.T. 1. E 02 | L.T. 9. E 01 | L.T. 1. E 02 |
| TH-228 | L.T. 1. E 01 | NR | L.T. 1. E 01 | L.T. 7. E 00 | L.T. 1. E 01 |
| TRITIUM ANALYSIS: | | | | | |
| H-3 | NR | L.T. 9. E 02 | NR | NR | NR |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

DRINKING WATER

( PCI/LITER )

STATION NUMBER: PW15

| DATE COLLECTED | 04/03-07/02 | 05/01-06/05 | 06/05-07/02 | 07/02-08/07 | 07/02-10/02 |
|---|---|---|---|---|---|
| RADIOCHEMICAL ANALYSIS: | | | | | |
| GR-P | NR | 6.3 +-1.2 E 00 | 5.1 +-1.7 E 00 | 6.3 +-1.4 E 00 | NR |
| I-131 | NR | L.T. 2. E-01 | L.T. 2. E-01 | L.T. 1. E-01 | NR |
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | NR | L.T. 5. E 01 | L.T. 5. E 01 | L.T. 4. E 01 | NR |
| K-40 | NR | L.T. 2. E 02 | L.T. 8. E 01 | L.T. 2. E 02 | NR |
| MN-54 | NR | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | NR |
| CO-58 | NR | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | NR |
| FE-59 | NR | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 9. E 00 | NR |
| CO-60 | NR | L.T. 6. E 00 | L.T. 6. E 00 | L.T. 4. E 00 | NR |
| ZN-65 | NR | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 9. E 00 | NR |
| NB-95/ZR-95 | NR | L.T. 6. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | NR |
| RU-103 | NR | L.T. 6. E 00 | L.T. 6. E 00 | L.T. 5. E 00 | NR |
| RU-106 | NR | L.T. 5. E 01 | L.T. 5. E 01 | L.T. 4. E 01 | NR |
| I-131 | NR | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 8. E 00 | NR |
| CS-134 | NR | L.T. 6. E 00 | L.T. 6. E 00 | L.T. 5. E 00 | NR |
| CS-137 | NR | L.T. 6. E 00 | L.T. 5. E 00 | L.T. 5. E 00 | NR |
| LA-140/BA-140 | NR | L.T. 8. E 00 | L.T. 8. E 00 | L.T. 5. E 00 | NR |
| CE-141 | NR | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 1. E 01 | NR |
| CE-144 | NR | L.T. 4. E 01 | L.T. 4. E 01 | L.T. 4. E 01 | NR |
| RA-226 | NR | L.T. 1. E 02 | L.T. 1. E 02 | L.T. 1. E 02 | NR |
| TH-228 | NR | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 9. E 00 | NR |
| TRITIUM ANALYSIS: | | | | | |
| H-3 | L.T. 9. E 02 | NR | NR | NR | 1.6 +-0.4 E 03 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

DRINKING WATER

( PCI/LITER )

STATION NUMBER RW15

| DATE COLLECTED | 08/07-09/04 | 09/04-10/02 | 10/02-01/02 | 10/02-11/06 | 10/02-11/06 |
|---|---|---|---|---|---|
| RADIOCHEMICAL ANALYSIS: | | | | | |
| GR-B | 6.5 +-1.3 E 00 | 6.3 +-1.3 E 00 | NR | 1.3 +-0.7 E 01 | 1.3 +-0.7 E 01 (A) |
| I-131 | L.T. 1. E-01 | L.T. 9. E-02 | NR | L.T. 3. E-01 | L.T. 3. E-01 |
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | L.T. 4. E 01 | L.T. 3. E 01 | NR | L.T. 9. E 00 | L.T. 1. E 01 |
| K-40 | L.T. 1. E 02 | L.T. 4. E 01 | NR | L.T. 2. E 01 | L.T. 2. E 01 |
| MN-54 | L.T. 4. E 00 | L.T. 3. E 00 | NR | L.T. 1. E 00 | L.T. 1. E 00 |
| CO-58 | L.T. 5. E 00 | L.T. 3. E 00 | NR | L.T. 1. E 00 | L.T. 1. E 00 |
| FE-59 | L.T. 1. E 01 | L.T. 6. E 00 | NR | L.T. 2. E 00 | L.T. 3. E 00 |
| CO-60 | L.T. 4. E 00 | L.T. 3. E 00 | NR | L.T. 1. E 00 | L.T. 1. E 00 |
| ZN-65 | L.T. 1. E 01 | L.T. 7. E 00 | NR | L.T. 2. E 00 | L.T. 2. E 00 |
| NB-95/ZR-95 | L.T. 5. E 00 | L.T. 3. E 00 | NR | L.T. 1. E 00 | L.T. 1. E 00 |
| RU-103 | L.T. 5. E 00 | L.T. 4. E 00 | NR | L.T. 1. E 00 | L.T. 1. E 00 |
| RU-106 | L.T. 4. E 01 | L.T. 3. E 01 | NR | L.T. 8. E 00 | L.T. 1. E 01 |
| I-131 | L.T. 8. E 00 | L.T. 7. E 00 | NR | L.T. 4. E 00 | L.T. 5. E 00 |
| CS-134 | L.T. 5. E 00 | L.T. 3. E 00 | NR | L.T. 1. E 00 | L.T. 1. E 00 |
| CS-137 | L.T. 5. E 00 | L.T. 3. E 00 | NR | L.T. 1. E 00 | L.T. 1. E 00 |
| LA-140/BA-140 | L.T. 7. E 00 | L.T. 4. E 00 | NR | L.T. 3. E 00 | L.T. 4. E 00 |
| CE-141 | L.T. 9. E 00 | L.T. 6. E 00 | NR | L.T. 2. E 00 | L.T. 3. E 00 |
| CE-144 | L.T. 3. E 01 | L.T. 2. E 01 | NR | L.T. 5. E 00 | L.T. 8. E 00 |
| RA-226 | L.T. 9. E 01 | L.T. 7. E 01 | NR | L.T. 2. E 01 | L.T. 2. E 01 |
| TH-228 | L.T. 8. E 00 | L.T. 6. E 00 | NR | L.T. 2. E 00 | L.T. 2. E 00 |
| TRITIUM ANALYSIS: | | | | | |
| H-3 | NR | NR | L.T. 7. E 02 | NR | NR |

(A) DUPLICATE ANALYSES

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

DRINKING WATER

( PCI/LITER )

STATION NUMBER BW15

| DATE COLLECTED | 11/06-12/04 | 12/04-01/02 |
|---|---|---|
| **RADIOCHEMICAL ANALYSIS:** | | |
| GR-B | 6.1 +-1.3 E 00 | 7.5 +-1.4 E 00 |
| I-131 | L.T. 1. E-01 | L.T. 1. E-01 |
| **GAMMA SPECTRUM ANALYSIS:** | | |
| BE-7 | L.T. 6. E 01 | L.T. 3. E 01 |
| K-40 | L.T. 2. E 02 | L.T. 6. E 01 |
| MN-54 | L.T. 5. E 00 | L.T. 3. E 00 |
| CO-58 | L.T. 6. E 00 | L.T. 3. E 00 |
| FE-59 | L.T. 1. E 01 | L.T. 7. E 00 |
| CO-60 | L.T. 6. E 00 | L.T. 4. E 00 |
| ZN-65 | L.T. 1. E 01 | L.T. 7. E 00 |
| NB-95/ZR-95 | L.T. 6. E 00 | L.T. 3. E 00 |
| RU-103 | L.T. 7. E 00 | L.T. 4. E 00 |
| RU-106 | L.T. 5. E 01 | L.T. 3. E 01 |
| I-131 | L.T. 1. E 01 | L.T. 6. E 00 |
| CS-134 | L.T. 6. E 00 | L.T. 4. E 00 |
| CS-137 | L.T. 6. E 00 | L.T. 4. E 00 |
| LA-140/BA-140 | L.T. 1. E 01 | L.T. 5. E 00 |
| CE-141 | L.T. 1. E 01 | L.T. 8. E 00 |
| CE-144 | L.T. 4. E 01 | L.T. 3. E 01 |
| RA-226 | L.T. 1. E 02 | L.T. 9. E 01 |
| TH-228 | L.T. 1. E 01 | L.T. 8. E 00 |
| **TRITIUM ANALYSIS:** | | |
| H-3 | NR | NR |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

DRINKING WATER

( PCI/LITER )

STATION NUMBER LW40

| DATE COLLECTED | 01/02-02/06 | 01/02-04/03 | 02/06-02/26 | 03/12-04/03 | 04/03-05/01 |
|---|---|---|---|---|---|
| RADIOCHEMICAL ANALYSIS: | | | | | |
| GR-B | 6.2 +-1.2 E 00 | NR | 5.0 +-0.3 E 01 | 6.4 +-1.3 E 00 | 5.6 +-1.4 E 00 |
| I-131 | L.T. 3. E-01 | NR | L.T. 4. E-01 | L.T. 1. E-01 | L.T. 6. E-01 |
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | L.T. 4. E 01 | NR | L.T. 4. E 01 | L.T. 3. E 01 | L.T. 4. E 01 |
| K-40 | L.T. 9. E 01 | NR | L.T. 8. E 01 | L.T. 5. E 01 | L.T. 2. E 02 |
| MN-54 | L.T. 4. E 00 | NR | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 5. E 00 |
| CO-58 | L.T. 4. E 00 | NR | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 5. E 00 |
| FE-59 | L.T. 8. E 00 | NR | L.T. 8. E 00 | L.T. 6. E 00 | L.T. 1. E 01 |
| CO-60 | L.T. 4. E 00 | NR | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 5. E 00 |
| ZN-65 | L.T. 8. E 00 | NR | L.T. 8. E 00 | L.T. 5. E 00 | L.T. 1. E 01 |
| NB-95/ZR-95 | L.T. 4. E 00 | NR | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 5. E 00 |
| RU-103 | L.T. 5. E 00 | NR | L.T. 5. E 00 | L.T. 3. E 00 | L.T. 5. E 00 |
| RU-106 | L.T. 4. E 01 | NR | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 4. E 01 |
| I-131 | L.T. 8. E 00 | NR | L.T. 1. E 01 | L.T. 5. E 00 | L.T. 7. E 00 |
| CS-134 | L.T. 4. E 00 | NR | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 5. E 00 |
| CS-137 | L.T. 5. E 00 | NR | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 5. E 00 |
| LA-140/BA-140 | L.T. 6. E 00 | NR | L.T. 7. E 00 | L.T. 4. E 00 | L.T. 5. E 00 |
| CE-141 | L.T. 9. E 00 | NR | L.T. 9. E 00 | L.T. 6. E 00 | L.T. 8. E 00 |
| CE-144 | L.T. 4. E 01 | NR | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 4. E 01 |
| RA-226 | L.T. 1. E 02 | NR | L.T. 9. E 01 | L.T. 7. E 01 | L.T. 1. E 02 |
| TH-228 | L.T. 8. E 00 | NR | L.T. 7. E 00 | L.T. 7. E 00 | L.T. 8. E 00 |
| TRITIUM ANALYSIS: | | | | | |
| H-3 | NR | L.T. 2. E 02 | NR | NR | NR |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

DRINKING WATER

( PCI/LITER )

STATION NUMBER LW40

| DATE COLLECTED | 04/03-07/02 | 05/01-06/05 | 06/05-07/02 | 07/02-08/01 | 07/02-10/02 |
|---|---|---|---|---|---|
| RADIOCHEMICAL ANALYSIS: | | | | | |
| GR-B | NR | 5.4 +-1.2 E 00 | 7.2 +-1.4 E 00 | 4.8 +-1.3 E 00 | NR |
| I-131 | NR | L.T. 2. E-01 | L.T. 3. E-01 | L.T. 1. E-01 | NR |
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | NR | L.T. 5. E 01 | L.T. 5. E 01 | L.T. 3. E 01 | NR |
| K-40 | NR | L.T. 2. E 02 | L.T. 7. E 02 | L.T. 5. E 01 | NR |
| MN-54 | NR | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 3. E 00 | NR |
| CO-58 | NR | L.T. 5. E 00 | L.T. 6. E 00 | L.T. 3. E 00 | NR |
| FE-59 | NR | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 7. E 00 | NR |
| CO-60 | NR | L.T. 6. E 00 | L.T. 6. E 00 | L.T. 4. E 00 | NR |
| ZN-65 | NR | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 7. E 00 | NR |
| NB-95/ZR-95 | NR | L.T. 6. E 00 | L.T. 6. E 00 | L.T. 3. E 00 | NR |
| RU-103 | NR | L.T. 6. E 00 | L.T. 6. E 00 | L.T. 3. E 00 | NR |
| RU-106 | NR | L.T. 5. E 01 | L.T. 5. E 01 | L.T. 3. E 01 | NR |
| I-131 | NR | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 5. E 00 | NR |
| CS-134 | NR | L.T. 6. E 00 | L.T. 6. E 00 | L.T. 3. E 00 | NR |
| CS-137 | NR | L.T. 6. E 00 | L.T. 6. E 00 | L.T. 4. E 00 | NR |
| LA-140/BA-140 | NR | L.T. 9. E 00 | L.T. 8. E 00 | L.T. 5. E 00 | NR |
| CE-141 | NR | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 5. E 00 | NR |
| CE-144 | NR | L.T. 4. E 01 | L.T. 4. E 01 | L.T. 2. E 01 | NR |
| RA-226 | NR | L.T. 1. E 02 | L.T. 1. E 02 | L.T. 6. E 01 | NR |
| TH-228 | NR | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 6. E 00 | NR |
| TRITIUM ANALYSIS: | | | | | |
| H-3 | L.T. 9. E 02 | NR | NR | NR | 8.6 +-3.4 E 02 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

DRINKING WATER

( PCI/LITER )

STATION NUMBER LW40

| DATE COLLECTED | 08/07-09/04 | 09/04-10/02 | 10/02-01/02 | 10/02-11/06 | 11/06-12/04 |
|---|---|---|---|---|---|
| RADIOCHEMICAL ANALYSIS: | | | | | |
| GR-B | 4.8 +-1.2 E 00 | 4.0 +-1.2 E 00 | NR | 7.2 +-1.4 E 00 | 7.3 +-1.5 E 00 |
| I-131 | L.T. 2. E-01 | L.T. 1. E-01 | NR | L.T. 3. E-01 | L.T. 1. E-01 |
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | L.T. 5. E 01 | L.T. 3. E 01 | NR | L.T. 4. E 01 | L.T. 5. E 01 |
| K-40 | L.T. 9. E 01 | L.T. 6. E 01 | NR | L.T. 7. E 01 | L.T. 2. E 02 |
| MN-54 | L.T. 4. E 00 | L.T. 3. E 00 | NR | L.T. 4. E 00 | L.T. 6. E 00 |
| CO-58 | L.T. 5. E 00 | L.T. 3. E 00 | NR | L.T. 4. E 00 | L.T. 6. E 00 |
| FE-59 | L.T. 9. E 00 | L.T. 7. E 00 | NR | L.T. 9. E 00 | L.T. 1. E 01 |
| CO-60 | L.T. 5. E 00 | L.T. 4. E 00 | NR | L.T. 4. E 00 | L.T. 6. E 00 |
| ZN-65 | L.T. 1. E 01 | L.T. 7. E 00 | NR | L.T. 9. E 00 | L.T. 1. E 01 |
| NB-95/ZR-95 | L.T. 5. E 00 | L.T. 3. E 00 | NR | L.T. 4. E 00 | L.T. 6. E 00 |
| RU-103 | L.T. 6. E 00 | L.T. 4. E 00 | NR | L.T. 5. E 00 | L.T. 6. E 00 |
| RU-106 | L.T. 5. E 01 | L.T. 3. E 01 | NR | L.T. 4. E 01 | L.T. 5. E 01 |
| I-131 | L.T. 9. E 00 | L.T. 9. E 00 | NR | L.T. 1. E 01 | L.T. 1. E 01 |
| CS-134 | L.T. 6. E 00 | L.T. 3. E 00 | NR | L.T. 5. E 00 | L.T. 6. E 00 |
| CS-137 | L.T. 5. E 00 | L.T. 4. E 00 | NR | L.T. 4. E 00 | L.T. 7. E 00 |
| LA-140/BA-140 | L.T. 7. E 00 | L.T. 7. E 00 | NR | L.T. 8. E 00 | L.T. 9. E 00 |
| CE-141 | L.T. 1. E 01 | L.T. 8. E 00 | NR | L.T. 9. E 00 | L.T. 1. E 01 |
| CE-144 | L.T. 4. E 01 | L.T. 3. E 01 | NR | L.T. 3. E 01 | L.T. 4. E 01 |
| RA-226 | L.T. 1. E 02 | L.T. 8. E 01 | NR | L.T. 9. E 01 | L.T. 1. E 02 |
| TH-228 | L.T. 1. E 01 | L.T. 7. E 00 | NR | L.T. 1. E 01 | L.T. 1. E 01 |
| TRITIUM ANALYSIS: | | | | | |
| H-3 | NR | NR | L.T. 7. E 02 | NR | NR |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSUR PATHWAY - WATERBORNE

DRINKING WATER

( PCI/LITER )

STATION NUMBER LW40

| | |
|---|---|
| DATE COLLECTED | 12/04-01/02 |
| RADIOCHEMICAL ANALYSIS: | |
| GR-B | 8.2 +-1.5 E 00 |
| I-131 | L.T. 1. E-01 |
| GAMMA SPECTRUM ANALYSIS: | |
| BE-7 | L.T. 3. E 01 |
| K-40 | L.T. 6. E 01 |
| MN-54 | L.T. 3. E 00 |
| CO-58 | L.T. 3. E 00 |
| FE-59 | L.T. 6. E 00 |
| CO-60 | L.T. 3. E 00 |
| ZN-65 | L.T. 7. E 00 |
| NB-95/ZR-95 | L.T. 3. E 00 |
| RU-103 | L.T. 3. E 00 |
| RU-106 | L.T. 3. E 01 |
| I-131 | L.T. 5. E 00 |
| CS-134 | L.T. 3. E 00 |
| CS-137 | L.T. 4. E 00 |
| LA-140/BA-140 | L.T. 5. E 00 |
| CE-141 | L.T. 6. E 00 |
| CE-144 | L.T. 2. E 01 |
| RA-226 | L.T. 7. E 01 |
| TH-228 | L.T. 6. E 00 |
| TRITIUM ANALYSIS: | |
| H-3 | NR |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

GROUND WATER

( PCI/LITER )

STATION NUMBER B-12

| DATE COLLECTED | 02/20 | | | 05/15 | | | 08/21 | | | 11/20 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RADIOCHEMICAL ANALYSIS: | | | | | | | | | | | | |
| I-131 | L.T. | 1. | E-01 | L.T. | 7. | E-01 | L.T. | 4. | E-01 | L.T. | 2. | E-01 |
| GAMMA SPECTRUM ANALYSIS: | | | | | | | | | | | | |
| BE-7 | L.T. | 5. | E 01 | L.T. | 3. | E 01 | L.T. | 3. | E 01 | L.T. | 3. | E 01 |
| K-40 | L.T. | 8. | E 01 | L.T. | 6. | E 01 | L.T. | 5. | E 01 | L.T. | 5. | E 01 |
| MN-54 | L.T. | 5. | E 00 | L.T. | 3. | E 00 | L.T. | 3. | E 00 | L.T. | 3. | E 00 |
| CO-58 | L.T. | 5. | E 00 | L.T. | 3. | E 00 | L.T. | 3. | E 00 | L.T. | 3. | E 00 |
| FE-59 | L.T. | 1. | E 01 | L.T. | 6. | E 00 | L.T. | 6. | E 00 | L.T. | 8. | E 00 |
| CO-60 | L.T. | 5. | E 00 | L.T. | 3. | E 00 | L.T. | 4. | E 00 | L.T. | 3. | E 00 |
| ZN-65 | L.T. | 1. | E 01 | L.T. | 6. | E 00 | L.T. | 6. | E 00 | L.T. | 7. | E 00 |
| NB-95/ZR-95 | L.T. | 5. | E 00 | L.T. | 4. | E 00 | L.T. | 3. | E 00 | L.T. | 3. | E 00 |
| RU-103 | L.T. | 6. | E 00 | L.T. | 4. | E 00 | L.T. | 3. | E 00 | L.T. | 4. | E 00 |
| RU-106 | L.T. | 4. | E 01 | L.T. | 3. | E 01 | L.T. | 3. | E 01 | L.T. | 3. | E 01 |
| I-131 | L.T. | 1. | E 01 | L.T. | 9. | E 00 | L.T. | 8. | E 00 | L.T. | 1. | E 01 |
| CS-134 | L.T. | 5. | E 00 | L.T. | 3. | E 00 | L.T. | 3. | E 00 | L.T. | 3. | E 00 |
| CS-137 | L.T. | 6. | E 00 | L.T. | 4. | E 00 | L.T. | 3. | E 00 | L.T. | 3. | E 00 |
| BA-140/RA-140 | L.T. | 7. | E 00 | L.T. | 6. | E 00 | L.T. | 6. | E 00 | L.T. | 8. | E 00 |
| CE-141 | L.T. | 1. | E 01 | L.T. | 8. | E 00 | L.T. | 6. | E 00 | L.T. | 8. | E 00 |
| CE-144 | L.T. | 4. | E 01 | L.T. | 3. | E 01 | L.T. | 2. | E 01 | L.T. | 3. | E 01 |
| RA-226 | L.T. | 1. | E 02 | L.T. | 8. | E 01 | L.T. | 6. | E 01 | L.T. | 7. | E 01 |
| TH-228 | L.T. | 1. | E 01 | L.T. | 7. | E 00 | L.T. | 5. | E 00 | L.T. | 6. | E 00 |
| TRITIUM ANALYSIS: | | | | | | | | | | | | |
| H-3 | L.T. | 2. | E 02 | L.T. | 1. | E 02 | L.T. | 2. | E 02 | L.T. | 1. | E 02 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

GROUND WATER

( PCI/LITER )

STATION NUMBER C-10

| DATE COLLECTED | 02/20 | 05/15 | 08/21 | 11/20 |
|---|---|---|---|---|
| RADIOCHEMICAL ANALYSIS: | | | | |
| I-131 | L.T. 1. E-01 | L.T. 2. E-01 | L.T. 4. E-01 | L.T. 1. E-01 |
| GAMMA SPECTRUM ANALYSIS: | | | | |
| BE-7 | L.T. 4. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 4. E 01 |
| K-40 | L.T. 9. E 01 | L.T. 5. E 01 | L.T. 5. E 01 | L.T. 9. E 01 |
| MN-54 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 4. E 00 |
| CO-58 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 4. E 00 |
| FE-59 | L.T. 8. E 00 | L.T. 6. E 00 | L.T. 6. E 00 | L.T. 9. E 00 |
| CO-60 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 4. E 00 |
| ZN-65 | L.T. 8. E 00 | L.T. 6. E 00 | L.T. 7. E 00 | L.T. 8. E 00 |
| NB-95/ZR-95 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 5. E 00 |
| RU-103 | L.T. 5. E 00 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 6. E 00 |
| RU-106 | L.T. 4. E 01 | L.T. 2. E 01 | L.T. 3. E 01 | L.T. 4. E 01 |
| I-131 | L.T. 9. E 00 | L.T. 9. E 00 | L.T. 9. E 00 | L.T. 2. E 01 |
| CS-134 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 4. E 00 |
| CS-137 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 4. E 00 |
| LA-140/BA-140 | L.T. 6. E 00 | L.T. 7. E 00 | L.T. 7. E 00 | L.T. 1. E 01 |
| CE-141 | L.T. 9. E 00 | L.T. 6. E 00 | L.T. 7. E 00 | L.T. 1. E 01 |
| CE-144 | L.T. 4. E 01 | L.T. 2. E 01 | L.T. 3. E 01 | L.T. 4. E 01 |
| RA-226 | L.T. 1. E 02 | L.T. 6. E 01 | L.T. 7. E 01 | L.T. 9. E 01 |
| TH-228 | L.T. 8. E 00 | L.T. 5. E 00 | L.T. 6. E 00 | L.T. 8. E 00 |
| TRITIUM ANALYSIS: | | | | |
| H-3 | L.T. 2. E 02 | L.T. 1. E 02 | L.T. 3. E 02 | L.T. 1. E 02 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

GROUND WATER

( PCI/LITER )

STATION NUMBER C-49

| DATE COLLECTED | 02/20 | | | 05/15 | | | 08/21 | | | 11/20 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RADIOCHEMICAL ANALYSIS: | | | | | | | | | | | | |
| I-131 | L.T. | 2. | E-01 | L.T. | 6. | E-01 | L.T. | 2. | E-01 | L.T. | 2. | E-01 |
| GAMMA SPECTRUM ANALYSIS: | | | | | | | | | | | | |
| BE-7 | L.T. | 3. | E 01 | L.T. | 5. | E 01 | L.T. | 4. | E 01 | L.T. | 3. | E 01 |
| K-40 | L.T. | 5. | E 01 | L.T. | 2. | E 02 | L.T. | 8. | E 01 | L.T. | 5. | E 01 |
| MN-54 | L.T. | 3. | E 00 | L.T. | 5. | E 00 | L.T. | 3. | E 00 | L.T. | 3. | E 00 |
| CO-58 | L.T. | 3. | E 00 | L.T. | 5. | E 00 | L.T. | 4. | E 00 | L.T. | 3. | E 00 |
| FE-59 | L.T. | 6. | E 00 | L.T. | 1. | E 01 | L.T. | 8. | E 00 | L.T. | 7. | E 00 |
| CO-60 | L.T. | 3. | E 00 | L.T. | 5. | E 00 | L.T. | 4. | E 00 | L.T. | 4. | E 00 |
| ZN-65 | L.T. | 6. | E 00 | L.T. | 1. | E 01 | L.T. | 7. | E 00 | L.T. | 7. | E 00 |
| NB-95/ZR-95 | L.T. | 3. | E 00 | L.T. | 5. | E 00 | L.T. | 4. | E 00 | L.T. | 4. | E 00 |
| RU-103 | L.T. | 3. | E 00 | L.T. | 6. | E 00 | L.T. | 5. | E 00 | L.T. | 4. | E 00 |
| RU-106 | L.T. | 3. | E 01 | L.T. | 4. | E 01 | L.T. | 3. | E 01 | L.T. | 3. | E 01 |
| I-131 | L.T. | 6. | E 00 | L.T. | 1. | E 01 | L.T. | 1. | E 01 | L.T. | 1. | E 01 |
| CS-134 | L.T. | 3. | E 00 | L.T. | 5. | E 00 | L.T. | 4. | E 00 | L.T. | 3. | E 00 |
| CS-137 | L.T. | 3. | E 00 | L.T. | 5. | E 00 | L.T. | 4. | E 00 | L.T. | 4. | E 00 |
| LA-140/BA-140 | L.T. | 6. | E 00 | L.T. | 1. | E 01 | L.T. | 6. | E 00 | L.T. | 8. | E 00 |
| CE-141 | L.T. | 4. | E 00 | L.T. | 1. | E 01 | L.T. | 9. | E 00 | L.T. | 7. | E 00 |
| CE-144 | L.T. | 2. | E 01 | L.T. | 4. | E 01 | L.T. | 3. | E 01 | L.T. | 2. | E 01 |
| RA-226 | L.T. | 7. | E 01 | L.T. | 1. | E 02 | L.T. | 8. | E 01 | L.T. | 7. | E 01 |
| TH-228 | L.T. | 6. | E 00 | L.T. | 9. | E 00 | L.T. | 7. | E 00 | L.T. | 6. | E 00 |
| TRITIUM ANALYSIS: | | | | | | | | | | | | |
| H-3 | L.T. | 2. | E 02 | L.T. | 1. | E 02 | L.T. | 2. | E 02 | L.T. | 1. | E 02 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

GROUND WATER

( PCI/LITER )

STATION NUMBER D-65

| DATE COLLECTED | 02/20 | | | 05/13 | | | 08/21 | | | 11/20 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RADIOCHEMICAL ANALYSIS: | | | | | | | | | | | | |
| I-131 | L.T. | 1. | E-01 | L.T. | 8. | E-01 | L.T. | 4. | E-01 | L.T. | 2. | E-01 |
| GAMMA SPECTRUM ANALYSIS: | | | | | | | | | | | | |
| BE-7 | L.T. | 3. | E 01 | L.T. | 4. | E 01 | L.T. | 3. | E 01 | L.T. | 4. | E 01 |
| K-40 | L.T. | 6. | E 01 | L.T. | 1. | E 02 | L.T. | 4. | E 01 | L.T. | 1. | E 02 |
| MN-54 | L.T. | 3. | E 00 | L.T. | 4. | E 00 | L.T. | 2. | E 00 | L.T. | 4. | E 00 |
| CO-58 | L.T. | 3. | E 00 | L.T. | 4. | E 00 | L.T. | 3. | E 00 | L.T. | 4. | E 00 |
| FE-59 | L.T. | 7. | E 00 | L.T. | 9. | E 00 | L.T. | 6. | E 00 | L.T. | 1. | E 01 |
| CO-60 | L.T. | 3. | E 00 | L.T. | 4. | E 00 | L.T. | 3. | E 00 | L.T. | 4. | E 00 |
| ZN-65 | L.T. | 6. | E 00 | L.T. | 9. | E 00 | L.T. | 6. | E 00 | L.T. | 1. | E 01 |
| NB-95/ZR-95 | L.T. | 3. | E 00 | L.T. | 4. | E 00 | L.T. | 3. | E 00 | L.T. | 5. | E 00 |
| RU-103 | L.T. | 4. | E 00 | L.T. | 5. | E 00 | L.T. | 3. | E 00 | L.T. | 6. | E 00 |
| RU-106 | L.T. | 3. | E 01 | L.T. | 5. | E 01 | L.T. | 2. | E 01 | L.T. | 4. | E 01 |
| I-131 | L.T. | 7. | E 00 | L.T. | 1. | E 01 | L.T. | 8. | E 00 | L.T. | 2. | E 01 |
| CS-134 | L.T. | 3. | E 00 | L.T. | 4. | E 00 | L.T. | 3. | E 00 | L.T. | 4. | E 00 |
| CS-137 | L.T. | 4. | E 00 | L.T. | 4. | E 00 | L.T. | 3. | E 00 | L.T. | 4. | E 00 |
| BA-140/RA-140 | L.T. | 6. | E 00 | L.T. | 8. | E 00 | L.T. | 6. | E 00 | L.T. | 9. | E 00 |
| CE-141 | L.T. | 7. | E 00 | L.T. | 8. | E 00 | L.T. | 6. | E 00 | L.T. | 1. | E 01 |
| CE-144 | L.T. | 3. | E 01 | L.T. | 3. | E 01 | L.T. | 7. | E 01 | L.T. | 4. | E 01 |
| RA-226 | L.T. | 8. | E 01 | L.T. | 8. | E 01 | L.T. | 6. | E 01 | L.T. | 1. | E 02 |
| TH-228 | L.T. | 7. | E 00 | L.T. | 7. | E 00 | L.T. | 5. | E 00 | L.T. | 8. | E 00 |
| TRITIUM ANALYSIS: | | | | | | | | | | | | |
| H-3 | L.T. | 1. | E 02 | L.T. | 2. | E 02 | L.T. | 1. | E 02 | L.T. | 2. | E 02 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

SURFACE WATER

( PCI/LITER )

STATION NUMBER DC

| DATE COLLECTED | 01/16 | 02/20 | 03/20 | 04/17 | 05/15 |
|---|---|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | L.T. 5. E 01 | L.T. 5. E 01 | L.T. 5. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| K-40 | L.T. 9. E 01 | L.T. 9. E 01 | L.T. 6. E 01 | L.T. 6. E 01 | L.T. 6. E 01 |
| MN-54 | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 3. E 00 |
| CO-58 | L.T. 4. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 |
| FE-59 | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 8. E 00 | L.T. 7. E 00 | L.T. 6. E 00 |
| CO-60 | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 3. E 00 |
| ZN-65 | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 6. E 00 | L.T. 7. E 00 | L.T. 7. E 00 |
| NB-95/ZR-95 | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 4. E 00 |
| RU-103 | L.T. 6. E 00 | L.T. 6. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| RU-106 | L.T. 5. E 01 | L.T. 5. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| I-131 | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 8. E 00 | L.T. 8. E 00 | L.T. 1. E 01 |
| CS-134 | L.T. 6. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 3. E 00 |
| CS-137 | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| BA-140/LA-140 | L.T. 8. E 00 | L.T. 7. E 00 | L.T. 7. E 00 | L.T. 6. E 00 | L.T. 7. E 00 |
| CE-141 | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 9. E 00 | L.T. 9. E 00 | L.T. 8. E 00 |
| CE-144 | L.T. 4. E 01 | L.T. 4. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| RA-226 | L.T. 1. E 02 | L.T. 1. E 02 | L.T. 1. E 02 | L.T. 1. E 02 | L.T. 9. E 01 |
| TH-228 | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 8. E 00 | L.T. 8. E 00 | L.T. 7. E 00 |
| TRITIUM ANALYSIS: | | | | | |
| H-3 | 7.0 +-0.5 E 03 | 7.5 +-0.7 E 03 | 7.9 +-0.6 E 03 | 7.8 +-0.6 E 03 | 7.4 +-3.6 E 03 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

SURFACE WATER

( PCI/LITER )

STATION NUMBER DC

| DATE COLLECTED | 06/19 | 07/17 | 08/21 | 08/21 | 09/18 |
|---|---|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | L.T. 5. E 01 | L.T. 3. E 01 | L.T. 4. E 01 | L.T. 3. E 01(A) | L.T. 3. E 01 |
| K-40 | L.T. 2. E 02 | L.T. 6. E 01 | L.T. 1. E 02 | L.T. 5. E 01 | L.T. 6. E 01 |
| MN-54 | L.T. 6. E 00 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 |
| CO-58 | L.T. 6. E 00 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 |
| FE-59 | L.T. 1. E 01 | L.T. 8. E 00 | L.T. 1. E 01 | L.T. 6. E 00 | L.T. 6. E 00 |
| CO-60 | L.T. 6. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 |
| ZN-65 | L.T. 1. E 01 | L.T. 6. E 00 | L.T. 1. E 01 | L.T. 6. E 00 | L.T. 7. E 00 |
| NB-95/ZR-95 | L.T. 6. E 00 | L.T. 4. E 00 | L.T. 5. E 00 | L.T. 3. E 00 | L.T. 3. E 00 |
| RU-103 | L.T. 6. E 00 | L.T. 4. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| RU-106 | L.T. 5. E 01 | L.T. 3. E 01 | L.T. 4. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| I-131 | L.T. 1. E 01 | L.T. 8. E 00 | L.T. 1. E 01 | L.T. 9. E 00 | L.T. 8. E 00 |
| CS-134 | L.T. 6. E 00 | L.T. 4. E 00 | L.T. 5. E 00 | L.T. 3. E 00 | L.T. 3. E 00 |
| CS-137 | L.T. 6. E 00 | L.T. 3. E 00 | L.T. 5. E 00 | L.T. 3. E 00 | L.T. 4. E 00 |
| LA-140/BA-140 | L.T. 9. E 00 | L.T. 6. E 00 | L.T. 9. E 00 | L.T. 7. E 00 | L.T. 7. E 00 |
| CE-141 | L.T. 1. E 01 | L.T. 9. E 00 | L.T. 9. E 00 | L.T. 7. E 00 | L.T. 7. E 00 |
| CE-144 | L.T. 4. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| RA-226 | L.T. 1. E 02 | L.T. 1. E 02 | L.T. 9. E 01 | L.T. 7. E 01 | L.T. 8. E 01 |
| TH-228 | L.T. 1. E 01 | L.T. 8. E 00 | L.T. 8. E 00 | L.T. 6. E 00 | L.T. 6. E 00 |
| TRITIUM ANALYSIS: | | | | | |
| H-3 | 6.6 +-0.8 E 03 | 6.2 +-1.4 E 03 | 5.6 +-0.5 E 03 | 4.8 +-0.5 E 03 | 5.8 +-0.5 E 03 |

(A) DUPLICATE ANALYSIS

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

SURFACE WATER

( PCI/LITER )

STATION NUMBER DC

| DATE COLLECTED | 10/16 | 11/20 | 12/16 |
|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | |
| BE-7 | L.T. 3. E 01 | L.T. 4. E 01 | L.T. 4. E 01 |
| K-40 | L.T. 5. E 01 | L.T. 5. E 01 | L.T. 1. E 02 |
| MN-54 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 4. E 00 |
| CO-58 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| FE-59 | L.T. 7. E 00 | L.T. 7. E 00 | L.T. 9. E 00 |
| CO-60 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| ZN-65 | L.T. 5. E 00 | L.T. 7. E 00 | L.T. 1. E 01 |
| NB-95/ZR-95 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 5. E 00 |
| RU-103 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 5. E 00 |
| RU-106 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 4. E 01 |
| I-131 | L.T. 2. E 01 | L.T. 1. E 01 | L.T. 9. E 00 |
| CS-134 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| CS-137 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| LA-140/BA-140 | L.T. 1. E 01 | L.T. 7. E 00 | L.T. 6. E 00 |
| CE-141 | L.T. 8. E 00 | L.T. 9. E 00 | L.T. 1. E 01 |
| CE-144 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 4. E 01 |
| RA-226 | L.T. 7. E 01 | L.T. 6. E 01 | L.T. 1. E 02 |
| TH-228 | L.T. 8. E 00 | L.T. 7. E 00 | L.T. 8. E 00 |
| TRITIUM ANALYSIS: | | | |
| H-3 | 5.3 +-0.6 E 03 | 9.0 +-0.6 E 03 | 5.5 +-0.5 E 03 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

SURFACE WATER

( PCI/LITER )

STATION NUMBER MUSH

| DATE COLLECTED | 01/16 | 01/16 | 02/20 | 03/20 | 04/17 |
|---|---|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | L.T. 3. E 01 | L.T. 3. E 01(A) | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| K-40 | L.T. 6. E 01 | L.T. 6. E 01 | L.T. 6. E 01 | L.T. 5. E 01 | L.T. 5. E 01 |
| MN-54 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 3. E 00 |
| CO-58 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 3. E 00 |
| FE-59 | L.T. 8. E 00 | L.T. 7. E 00 | L.T. 7. E 00 | L.T. 7. E 00 | L.T. 7. E 00 |
| CO-60 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 |
| ZN-65 | L.T. 8. E 00 | L.T. 7. E 00 | L.T. 8. E 00 | L.T. 6. E 00 | L.T. 6. E 00 |
| NB-95/ZR-95 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 3. E 00 |
| RU-103 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| RU-106 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| I-131 | L.T. 7. E 00 | L.T. 7. E 00 | L.T. 8. E 00 | L.T. 8. E 00 | L.T. 8. E 00 |
| CS-134 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 4. E 00 |
| CS-137 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| BA-140/LA-140 | L.T. 6. E 00 | L.T. 7. E 00 | L.T. 6. E 00 | L.T. 6. E 00 | L.T. 6. E 00 |
| CE-141 | L.T. 7. E 00 | L.T. 8. E 00 | L.T. 8. E 00 | L.T. 8. E 00 | L.T. 8. E 00 |
| CE-144 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| RA-226 | L.T. 8. E 01 | L.T. 1. E 02 | L.T. 8. E 01 | L.T. 9. E 01 | L.T. 8. E 01 |
| TH-228 | L.T. 7. E 00 | L.T. 8. E 00 | L.T. 7. E 00 | L.T. 7. E 00 | L.T. 7. E 00 |
| TRITIUM ANALYSIS: | | | | | |
| H-3 | L.T. 5. E 02 | L.T. 5. E 02 | L.T. 9. E 02 | L.T. 8. E 02 | L.T. 9. E 02 |

(A) DUPLICATE ANALYSIS

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

SURFACE WATER

( PCI/LITER )

STATION NUMBER MUSH

| DATE COLLECTED | 05/15 | 06/19 | 07/17 | 08/21 | 09/18 |
|---|---|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | L.T. 5. E 01 | L.T. 5. E 01 | L.T. 4. E 01 | L.T. 4. E 01 | L.T. 7. E 01 |
| K-40 | L.T. 5. E 01 | L.T. 9. E 01 | L.T. 1. E 02 | L.T. 1. E 02 | L.T. 2. E 02 |
| MN-54 | L.T. 3. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 7. E 00 |
| CO-58 | L.T. 3. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 7. E 00 |
| FE-59 | L.T. 7. E 00 | L.T. 1. E 01 | L.T. 9. E 00 | L.T. 8. E 00 | L.T. 2. E 01 |
| CO-60 | L.T. 4. E 00 | L.T. 6. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 7. E 00 |
| ZN-65 | L.T. 6. E 00 | L.T. 1. E 01 | L.T. 9. E 00 | L.T. 8. E 00 | L.T. 1. E 01 |
| NB-95/ZR-95 | L.T. 3. E 00 | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 8. E 00 |
| RU-103 | L.T. 4. E 00 | L.T. 6. E 00 | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 9. E 00 |
| RU-106 | L.T. 3. E 01 | L.T. 5. E 01 | L.T. 4. E 01 | L.T. 3. E 01 | L.T. 6. E 01 |
| I-131 | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 9. E 00 | L.T. 1. E 01 | L.T. 2. E 01 |
| CS-134 | L.T. 3. E 00 | L.T. 6. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 8. E 00 |
| CS-137 | L.T. 4. E 00 | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 8. E 00 |
| LA-140/BA-140 | L.T. 7. E 00 | L.T. 8. E 00 | L.T. 6. E 00 | L.T. 7. E 00 | L.T. 1. E 01 |
| CE-141 | L.T. 7. E 00 | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 2. E 01 |
| CE-144 | L.T. 3. E 01 | L.T. 4. E 01 | L.T. 4. E 01 | L.T. 4. E 01 | L.T. 7. E 01 |
| RA-226 | L.T. 2. E 01 | L.T. 1. E 02 | L.T. 1. E 02 | L.T. 9. E 01 | L.T. 2. E 02 |
| TH-228 | L.T. 7. E 00 | L.T. 1. E 01 | L.T. 8. E 00 | L.T. 7. E 00 | L.T. 1. E 01 |
| TRITIUM ANALYSIS: | | | | | |
| H-3 | L.T. 8. E 02 | L.T. 8. E 02 | L.T. 9. E 02 | L.T. 6. E 02 | L.T. 6. E 02 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

SURFACE WATER

( PCI/LITER )

STATION NUMBER MUSH

| DATE COLLECTED | 10/16 | 11/20 | 12/18 |
|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | |
| BE-7 | L.T. 3. E 01 | L.T. 4. E 01 | L.T. 4. E 01 |
| K-40 | L.T. 4. E 01 | L.T. 6. E 01 | L.T. 9. E 01 |
| MN-54 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 4. E 00 |
| CO-58 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| FE-59 | L.T. 6. E 00 | L.T. 7. E 00 | L.T. 8. E 00 |
| CO-60 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| ZN-65 | L.T. 6. E 00 | L.T. 8. E 00 | L.T. 8. E 00 |
| NB-95/ZR-95 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| RU-103 | L.T. 3. E 00 | L.T. 5. E 00 | L.T. 5. E 00 |
| RU-106 | L.T. 2. E 01 | L.T. 3. E 01 | L.T. 4. E 01 |
| I-131 | L.T. 8. E 00 | L.T. 2. E 01 | L.T. 9. E 00 |
| CS-134 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| CS-137 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 5. E 00 |
| LA-140/BA-140 | L.T. 5. E 00 | L.T. 8. E 00 | L.T. 7. E 00 |
| CE-141 | L.T. 6. E 00 | L.T. 9. E 00 | L.T. 9. E 00 |
| CE-144 | L.T. 2. E 01 | L.T. 3. E 01 | L.T. 4. E 01 |
| RA-226 | L.T. 6. E 01 | L.T. 8. E 01 | L.T. 1. E 02 |
| TH-228 | L.T. 5. E 00 | L.T. 7. E 00 | L.T. 8. E 00 |
| TRITIUM ANALYSIS: | | | |
| H-3 | L.T. 9. E 02 | L.T. 6. E 02 | L.T. 6. E 02 |

WOLF CREEK [illegible] NUCLEAR OPERATING CORP
EXPOSURE [illegible] BEAT - WATERBORNE

[illegible] ICE WATER

[illegible] PCI/LITER )

STATION NUMBER SP

| DATE COLLECTED | 01/16 | 02/20 | 03/20 | 04/17 | 05/15 |
|---|---|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | L.T. 3. E 01 | L.T. [illegible] E 01 | L.T. 4. E 01 | L.T. 4. E 01 | L.T. 3. E 01 |
| K-40 | L.T. 5. E 01 | L.T. 2. E 02 | L.T. 1. E 02 | L.T. 1. E 02 | L.T. 5. E 01 |
| MN-54 | L.T. 9. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 3. E 00 |
| CO-58 | L.T. 3. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 3. E 00 |
| FE-59 | L.T. 6. E 00 | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 7. E 00 |
| CO-60 | L.T. 3. E 00 | L.T. 6. E 00 | L.T. 4. E 00 | L.T. 5. E 00 | L.T. 3. E 00 |
| ZN-65 | L.T. 5. E 00 | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 6. E 00 |
| NB-95/ZR-95 | L.T. 3. E 00 | L.T. 6. E 00 | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 3. E 00 |
| RU-103 | L.T. 4. E 00 | L.T. 6. E 00 | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 4. E 00 |
| RU-106 | L.T. 3. E 01 | L.T. 5. E 01 | L.T. 4. E 01 | L.T. 4. E 01 | L.T. 2. E 01 |
| I-131 | L.T. 4. E 00 | L.T. 1. E 01 | L.T. 9. E 00 | L.T. 1. E 01 | L.T. 9. E 00 |
| CS-134 | L.T. 3. E 00 | L.T. 6. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 3. E 00 |
| CS-137 | L.T. 3. E 00 | L.T. 6. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 3. E 00 |
| BA-140/RA-140 | L.T. 5. E 00 | L.T. 9. E 00 | L.T. 7. E 00 | L.T. 8. E 00 | L.T. 5. E 00 |
| CE-141 | L.T. 6. E 00 | L.T. 1. E 01 | L.T. 9. E 00 | L.T. 9. E 00 | L.T. 6. E 00 |
| CE-144 | L.T. 2. E 01 | L.T. 4. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| RA-226 | L.T. 7. E 01 | L.T. 1. E 02 | L.T. 9. E 01 | L.T. 9. E 01 | L.T. 8. E 01 |
| TH-228 | L.T. 6. E 00 | L.T. 1. E 01 | L.T. 7. E 00 | L.T. 7. E 00 | L.T. 6. E 00 |
| TRITIUM ANALYSIS: | | | | | |
| H-3 | 6.8 +-0.5 E 03 | 8.1 +-0.7 E 03 | 7.7 +-0.6 E 03 | 7.5 +-0.6 E 03 | 7.1 +-0.6 E 03 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

SURFACE WATER

( PCI/LITER )

STATION NUMBER SP

| DATE COLLECTED | 06/19 | 07/17 | 08/21 | 09/18 | 10/16 |
|---|---|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | L.T. 4. E 02 | L.T. 4. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| K-40 | L.T. 7. E 01 | L.T. 1. E 02 | L.T. 5. E 01 | L.T. 5. E 01 | L.T. 5. E 01 |
| MN-54 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 3. E 00 |
| CO-58 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 3. E 00 |
| FE-59 | L.T. 9. E 00 | L.T. 1. E 01 | L.T. 6. E 00 | L.T. 7. E 00 | L.T. 8. E 00 |
| CO-60 | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 3. E 00 |
| ZN-65 | L.T. 9. E 00 | L.T. 1. E 01 | L.T. 6. E 00 | L.T. 6. E 00 | L.T. 7. E 00 |
| NB-95/ZR-95 | L.T. 6. E 00 | L.T. 5. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 3. E 00 |
| RU-103 | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 4. E 00 | L.T. 3. E 00 | L.T. 4. E 00 |
| RU-106 | L.T. 4. E 01 | L.T. 4. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| I-131 | L.T. 8. E 00 | L.T. 9. E 00 | L.T. 9. E 00 | L.T. 7. E 00 | L.T. 2. E 01 |
| CS-134 | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 3. E 00 |
| CS-137 | L.T. 6. E 00 | L.T. 5. E 00 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 4. E 00 |
| LA-140/BA-140 | L.T. 8. E 00 | L.T. 8. E 00 | L.T. 6. E 00 | L.T. 5. E 00 | L.T. 9. E 00 |
| CE-141 | L.T. 4. E 00 | L.T. 9. E 00 | L.T. 7. E 00 | L.T. 7. E 00 | L.T. 9. E 00 |
| CE-144 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 3. E 01 |
| RA-226 | L.T. 9. E 01 | L.T. 9. E 01 | L.T. 7. E 01 | L.T. 7. E 01 | L.T. 8. E 01 |
| TH-228 | L.T. 1. E 01 | L.T. 8. E 00 | L.T. 6. E 00 | L.T. 6. E 00 | L.T. 7. E 00 |
| TRITIUM ANALYSIS: | | | | | |
| H-3 | 7.6 +-0.6 E 03 | 6.6 +-1.4 E 03 | 5.6 +-0.5 E 03 | 6.2 +-0.5 E 03 | 5.1 +-0.6 E 03 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

SURFACE WATER

( PCI/LITER )

STATION NUMBER SP

| DATE COLLECTED | 11/20 | 12/18 |
|---|---|---|
| **GAMMA SPECTRUM ANALYSIS:** | | |
| BE-7 | L.T. 4. E 01 | L.T. 4. E 01 |
| K-40 | L.T. 6. E 01 | L.T. 1. E 02 |
| MN-54 | L.T. 3. E 00 | L.T. 4. E 00 |
| CO-58 | L.T. 4. E 00 | L.T. 4. E 00 |
| FE-59 | L.T. 8. E 00 | L.T. 1. E 01 |
| CO-60 | L.T. 3. E 00 | L.T. 4. E 00 |
| ZN-65 | L.T. 7. E 00 | L.T. 1. E 01 |
| NB-95/ZR-95 | L.T. 4. E 00 | L.T. 5. E 00 |
| RU-103 | L.T. 5. E 00 | L.T. 5. E 00 |
| RU-106 | L.T. 4. E 01 | L.T. 4. E 01 |
| I-131 | L.T. 1. E 01 | L.T. 9. E 00 |
| CS-134 | L.T. 4. E 00 | L.T. 5. E 00 |
| CS-137 | L.T. 4. E 00 | L.T. 5. E 00 |
| LA-140/BA-140 | L.T. 1. E 01 | L.T. 7. E 00 |
| CE-141 | L.T. 1. E 01 | L.T. 9. E 00 |
| CE-144 | L.T. 4. E 01 | L.T. 3. E 01 |
| RA-226 | L.T. 1. E 02 | L.T. 9. E 01 |
| TH-228 | L.T. 9. E 00 | L.T. 8. E 00 |
| **TRITIUM ANALYSIS:** | | |
| H-3 | 5.6 +-0.5 E 03 | 5.3 +-0.5 E 03 |

WOLF CREEK NUCLEAR OPERATING CORP
EXPOSURE PATHWAY - WATERBORNE

SURFACE WATER

( PCI/LITER )

STATION NUMBER SPAL

| DATE COLLECTED | 08/21 | 09/18 | 10/16 | 11/20 | 12/18 |
|---|---|---|---|---|---|
| GAMMA SPECTRUM ANALYSIS: | | | | | |
| BE-7 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 4. E 01 | L.T. 5. E 01 | L.T. 3. E 01 |
| K-40 | L.T. 6. E 01 | L.T. 5. E 01 | L.T. 1. E 02 | L.T. 1. E 02 | L.T. 6. E 01 |
| MN-54 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 5. E 00 | L.T. 3. E 00 |
| CO-58 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 5. E 00 | L.T. 3. E 00 |
| FE-59 | L.T. 6. E 00 | L.T. 6. E 00 | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 7. E 00 |
| CO-60 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 5. E 00 | L.T. 4. E 00 |
| ZN-65 | L.T. 6. E 00 | L.T. 6. E 00 | L.T. 9. E 00 | L.T. 1. E 01 | L.T. 8. E 00 |
| NB-95/ZR-95 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 5. E 00 | L.T. 5. E 00 | L.T. 3. E 00 |
| RU-103 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 6. E 00 | L.T. 6. E 00 | L.T. 4. E 00 |
| RU-106 | L.T. 3. E 01 | L.T. 3. E 01 | L.T. 4. E 01 | L.T. 4. E 01 | L.T. 3. E 01 |
| I-131 | L.T. 1. E 01 | L.T. 7. E 00 | L.T. 2. E 01 | L.T. 2. E 01 | L.T. 8. E 00 |
| CS-134 | L.T. 3. E 00 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 5. E 00 | L.T. 3. E 00 |
| CS-137 | L.T. 3. E 00 | L.T. 4. E 00 | L.T. 4. E 00 | L.T. 5. E 00 | L.T. 4. E 00 |
| LA-140/BA-140 | L.T. 7. E 00 | L.T. 7. E 00 | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 6. E 00 |
| CE-141 | L.T. 8. E 00 | L.T. 6. E 00 | L.T. 1. E 01 | L.T. 1. E 01 | L.T. 8. E 00 |
| CE-144 | L.T. 3. E 01 | L.T. 2. E 01 | L.T. 3. E 01 | L.T. 4. E 01 | L.T. 3. E 01 |
| RA-226 | L.T. 8. E 01 | L.T. 6. E 01 | L.T. 8. E 01 | L.T. 9. E 01 | L.T. 8. E 01 |
| TH-228 | L.T. 7. E 00 | L.T. 6. E 00 | L.T. 7. E 00 | L.T. 8. E 00 | L.T. 7. E 00 |
| TRITIUM ANALYSIS: | | | | | |
| H-3 | 5.6 +-0.5 E 03 | 6.1 +-0.5 E 03 | 5.5 +-0.6 E 03 | 5.9 +-0.5 E 03 | 5.4 +-0.5 E 03 |

# APPENDIX C

## ENVIRONMENTAL MONITORING TRITIUM LEVELS

## ENVIRONMENTAL MONITORING TRITIUM LEVELS

Tritium is monitored in the environment around the plant through drinking, surface, and ground water samples. Table C-1 summarizes the characteristics of these samples.

TABLE C-1

| SAMPLE | FREQUENCY | REQUIRED LLD (pCi/l) | ACHIEVED LLD (pCi/l) | REPORTING LEVEL (pCi/l) | CURRENT LEVEL (pCi/l) |
|---|---|---|---|---|---|
| Surface | Monthly | 3000 | 700-900 | 30,000 | 7000 - 8000 |
| Ground | Quarterly | 2000 | 100-200 | 20,000 | <200 |
| Drinking | Quarterly | 2000 | 700-900 | 20,000 | <900 |

Before looking at tritium levels in the environment a knowledge of the quantity of tritium released from the plant is required. That information is shown on Table C-2 and Figure C-1. This information was taken from the Semi-annual Radiological Effluent Reports (1985-1990) submitted to the NRC. Since the beginning of plant operation through July 1990 a total of 2,186 Ci of tritium has been released to Wolf Creek Cooling Lake (WCCL). Some of the released tritium has decayed or been removed from the lake through other mechanisms such as evaporation, percolation to ground water, and discharges to Wolf Creek. The rest of the tritium has remained in WCCL.

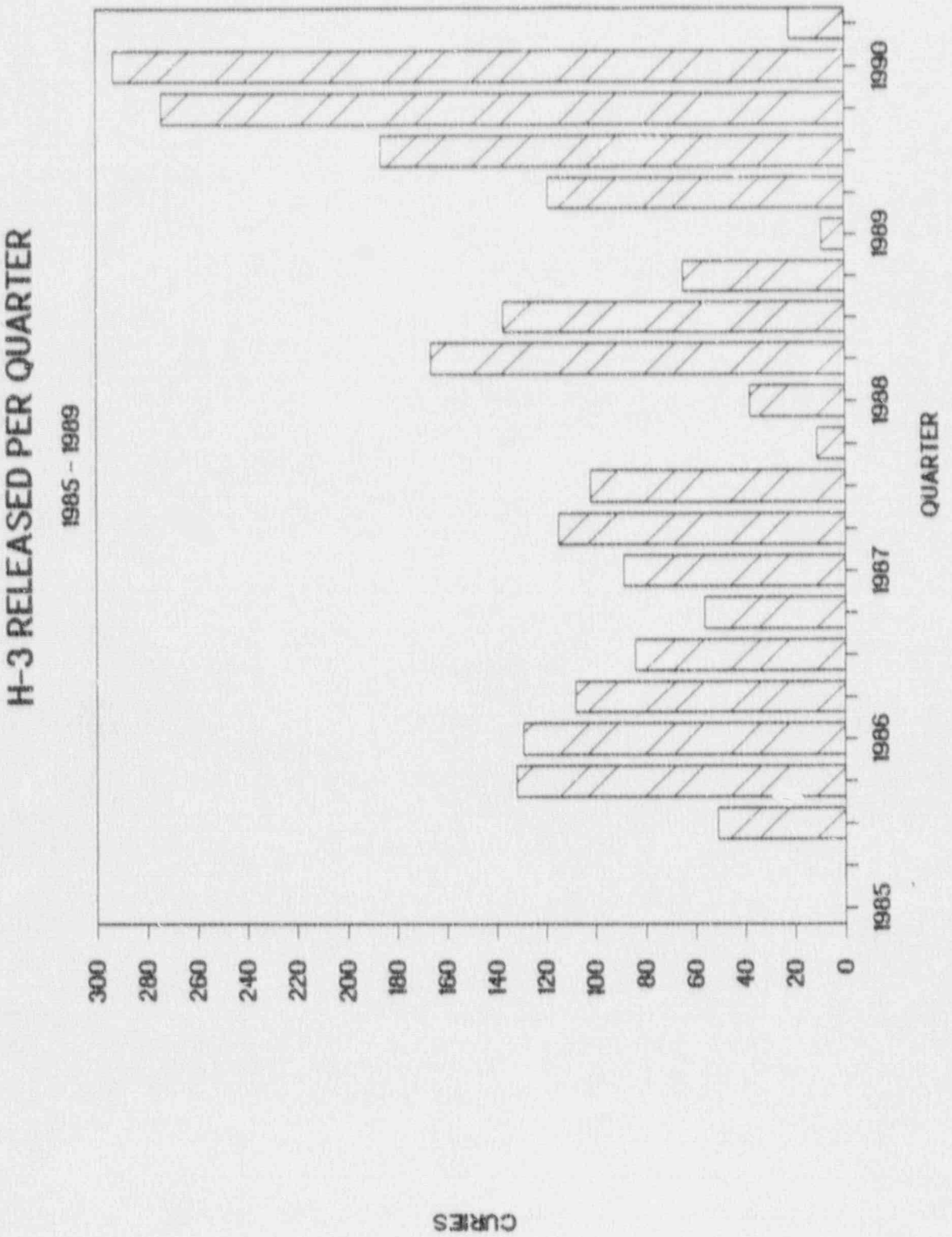
TABLE C-2

Semi Annual Effluent Release Report Data

| YEAR | QUARTER | CURIES RELEASED | YEARLY TOTAL | DILUTION VOLUME (l) |
|---|---|---|---|---|
| 1985 | 1 | | | |
| | 2 | 0.137 | | 5.22E09 |
| | 3 | 50.8 | | 4.20E10 |
| | 4 | 132.0 | (182.94) | 2.28E10 |
| 1986 | 1 | 129 | | 2.35E10 |
| | 2 | 108 | | 2.10E10 |
| | 3 | 84.0 | | 1.64E10 |
| | 4 | 56.3 | (377.3) | 1.20E10 |
| 1987 | 1 | 88.5 | | 9.84E09 |
| | 2 | 115 | | 1.30E10 |
| | 3 | 102 | | 2.40E10 |
| | 4 | 11.1 | (316.60) | 3.21E09 |
| 1988 | 1 | 38 | | 7.61E09 |
| | 2 | 166 | | 6.93E09 |
| | 3 | 137 | | 8.25E09 |
| | 4 | 64.7 | (405.70) | 3.70E09 |
| 1989 | 1 | 9.23 | | 2.54E09 |
| | 2 | 119 | | 3.22E09 |
| | 3 | 186 | | 3.82E09 |
| | 4 | 274 | (588.23) | 2.45E09 |
| 1990 | 1 | 293 | | 8.93E09 |
| | 2 | 22.1 | | 1.11E10 |
| | 3 | | | |
| | 4 | | | |

+ AVG. YEARLY REL 437 Ci
+ AVG. YEARLY DIL VOL 4.93E10
+ EXCLUDES DATA FROM 2ND QUARTER 1985

FIGURE C-1


H-3 RELEASED PER QUARTER
1985 - 1989
CURIES
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
1985
1986
1987
1988
1989
1990
QUARTER

**SURFACE WATER SAMPLING**

Surface water has been sampled at three locations: 1) John Redmond Reservoir below the gates (MJSH), 2) WCCL Discharge Cove (DC), and 3) WCCL Main Dam by the Auxiliary Spillway (SP). Location SP(ALT) had not been added when this study was performed. Prior to plant operations the tritium concentration in WCCL was less than the lower limit of detection. Analysis results from monthly samples obtained at sample locations DC and SP reflect the buildup of tritium in WCCL due to plant effluents. The analysis results for DC and SP are displayed graphically in Figures C-2 and C-3 respectively.

This tritium buildup in WCCL will reach an equilibrium value which is dependent upon Curies of H-3 released, WCCL makeup and discharge, and radioisotopic decay. The USAR equilibrium value, taken from USAR Table 11.2-3 CALCULATED LIQUID EFFLUENT DISCHARGE CONCENTRATIONS FROM ROUTINE OPERATION, is 23,400 pCi/l. The USAR value takes into consideration buildup or reconcentration of tritium in the cooling lake and the circulating water discharge over a 40 year plant life expectancy. The last five of these years are considered to be during a drought.

Using a simplistic model for calculating nuclide buildup taken from NUREG/CR-3332, Radiological Assessment - A Textbook on Environmental Dose Analysis, an approximation of the current concentration as well as the equilibrium concentration expected in WCCL has been calculated. Using an average tritium release of 437 Ci/year and an average dilution volume of 4.93E10 l/year, the current tritium concentration in WCCL should be approximately 7200 pCi/l and the equilibrium concentration will approach 9400 pCi/l in seven more years. These figures are based on average release rates, dilution flows, lake discharge/makeup flow, and does not account for periods of drought or increasing tritium releases from the plant.

Current tritium concentrations in samples obtained from WCCL discharge cove and at the main dam vary from 7000 - 8000 pCi/l. Occasionally, a higher than normal tritium concentration will be detected in the discharge cove when sampling is coincidental with a radioactive release from the plant.

FIGURE C-2

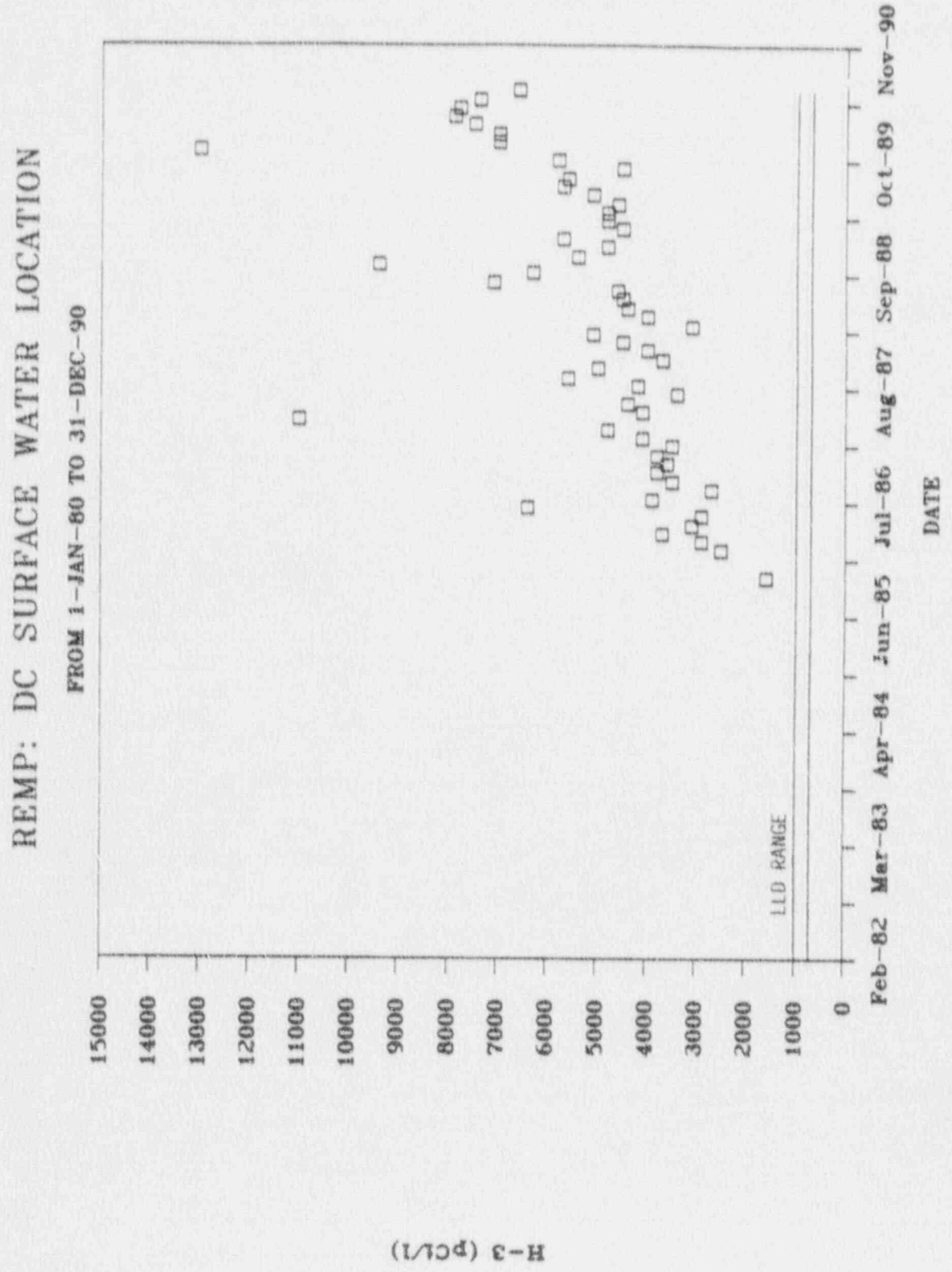
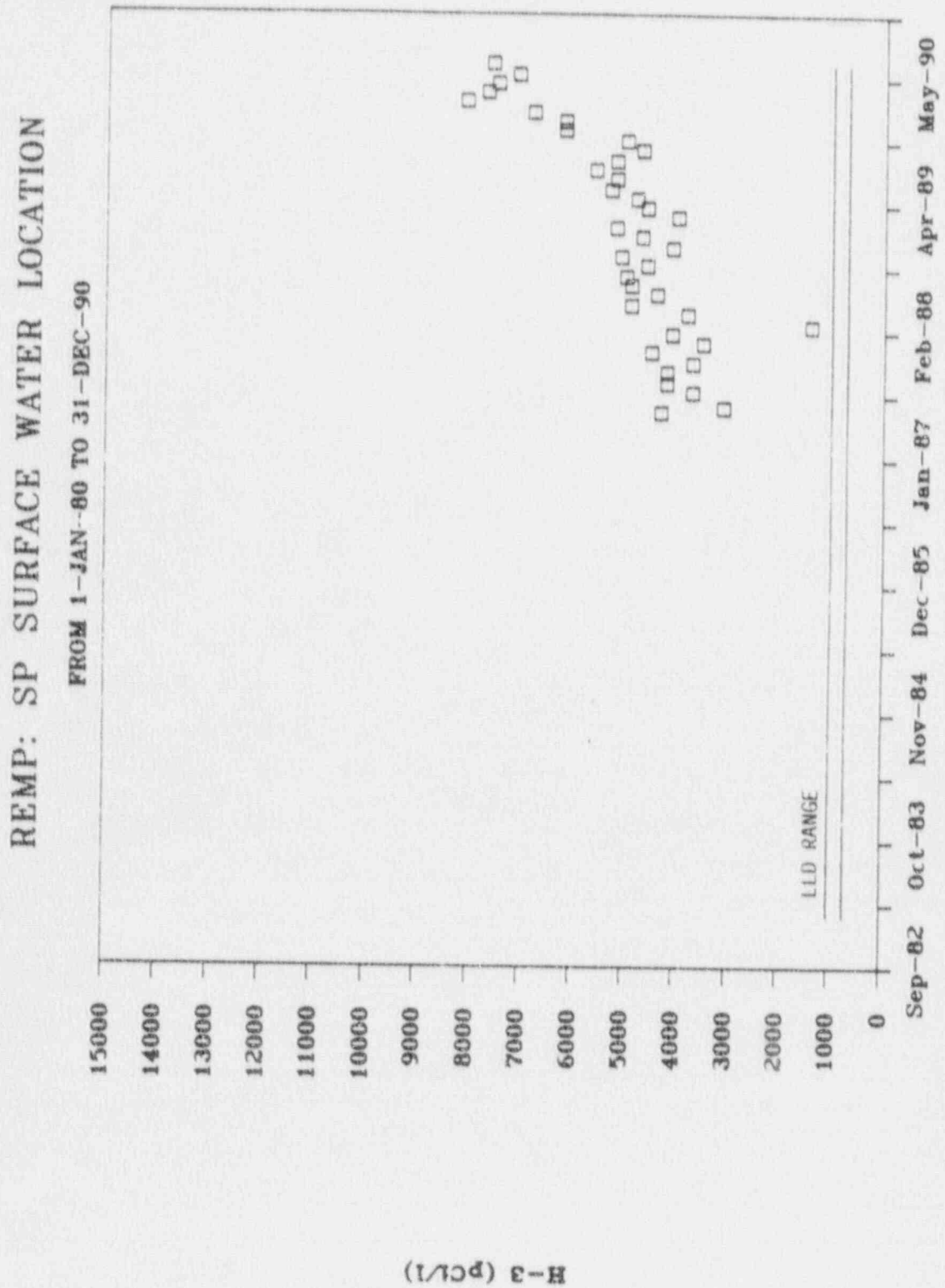

REMP: DC SURFACE WATER LOCATION
FROM 1-JAN-80 TO 31-DEC-90
H-3 (pCi/l)
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
LLD RANGE
Feb-82
Mar-83
Apr-84
Jun-85
Jul-86
Aug-87
Sep-88
Oct-89
Nov-90
DATE

FIGURE C-3


REMP: SP SURFACE WATER LOCATION
FROM 1-JAN-80 TO 31-DEC-90
H-3 (pCi/l)
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
LLD RANGE
Sep-82
Oct-83
Nov-84
Dec-85
Jan-87
Feb-88
Apr-89
May-90
DATE

**GROUND WATER SAMPLING**

Ground water is obtained from four locations around the plant, a control location (B-12) and three indicator locations, (C-10, C-49, D-65). Figure 4 shows the actual sample locations.

Since February 1988 tritium activities of 150 to 300 pCi/l have been detected routinely in ground water samples. Occasionally activities as high as 600 - 800 pCi/l H-3 have been detected. Figures C-5 through C-8 show the detection limits achieved as well as the positive tritium activities measured at the same locations.

Figures C-5 through C-8 also show how ground water tritium is more difficult to compare to preoperational data because the lower limit of detection has decreased since the initiation of the environmental sampling program. Initially the LLD was 2000 pCi/l. This was reduced to 1000 pCi/l in October 1981 and reduced again in February 1988 to 100 - 200 pCi/l by changing the analysis method (Reflected on Figures 5-8). This means the levels we are currently detecting were not seen prior to operation because of the higher detection limit. Therefore, looking as WCGS data alone, does not allow a conclusion about the source of tritium to be made. However, a comparison of Wolf Creek data to that obtained by the State of Kansas at these same sample locations indicate the tritium is due to plant operations. Prior to plant operation to the tritium activity measured by the State of Kansas was $\leq$ 100 pCi/l (samples obtained from June 1983 through May 1985). Following plant start-up, tritium activities were occasionally detected above 500 pCi/l at all the indicator locations. See Table C-4 for actual State of Kansas data.

Since the tritium activity in the ground water is most likely due to plant effluents, dose projections have been made from the activity levels detected. Using the highest detected activity at all of the sample locations, 810 pCi/l, and the drinking water pathway doses were calculated for all the age groups, see Table C-3.

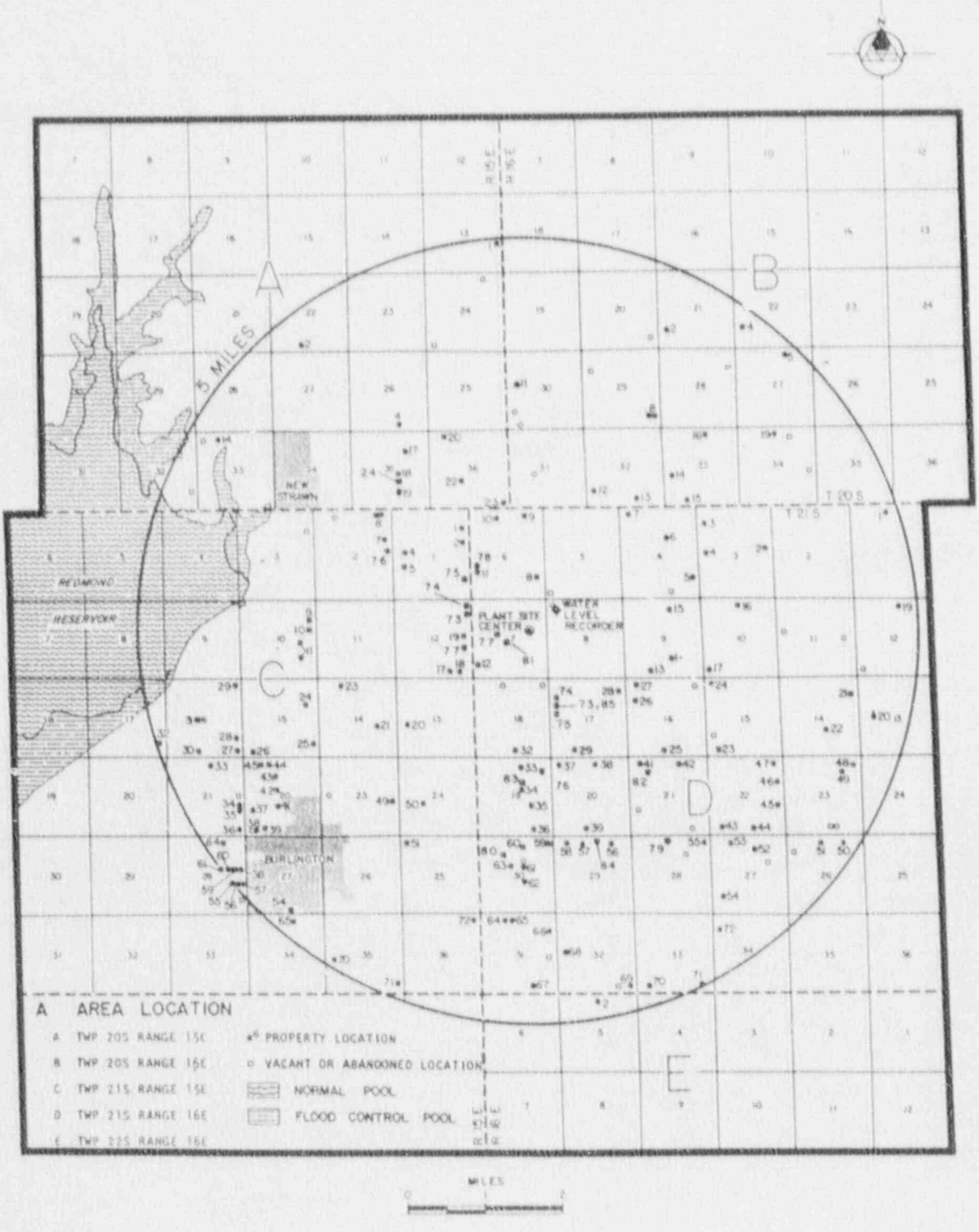
TABLE C-3

TOTAL BODY AND ORGAN DOSE FROM GROUND WATER TRITIUM

| AGE GROUP | MAXIMUM INDIVIDUAL | AVERAGE INDIVIDUAL |
|---|---|---|
| Adult | 0.062 mrem/yr | 0.032 mrem/yr |
| Teen | 0.044 | 0.022 |
| Child | 0.084 | 0.043 |
| Infant | 0.082 | |

The dose limits from liquid effluents for any member of the general public are less than or equal to 1.5 mrem/qtr total body and less than or equal to 5 mrem/qtr to any organ and less than or equal to 3 mrem/yr total body and less than or equal to 10 mrem/yr to any organ.

FIGURE C-4


A
B
C
D
E
5 MILES
NEW STRAWN
REDMOND RESERVOIR
PLANT SITE CENTER
WATER LEVEL RECORDER
T20S
T21S
BURLINGTON
A AREA LOCATION
A TWP 20S RANGE 15E
B TWP 20S RANGE 16E
C TWP 21S RANGE 15E
D TWP 21S RANGE 16E
E TWP 22S RANGE 16E
#6 PROPERTY LOCATION
o VACANT OR ABANDONED LOCATION
NORMAL POOL
FLOOD CONTROL POOL
MILES
0
2

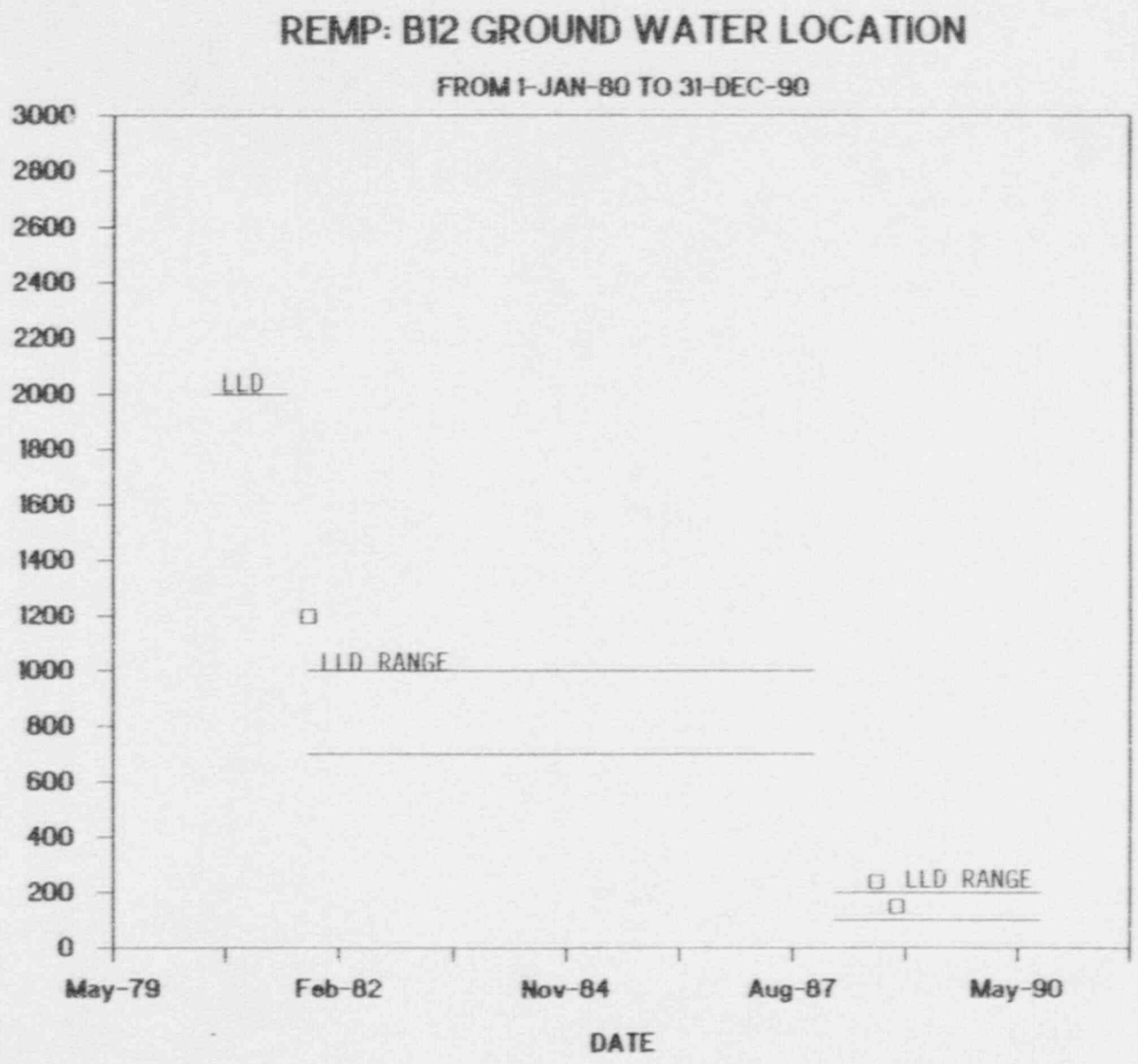

REMP: B12 GROUND WATER LOCATION
FROM 1-JAN-80 TO 31-DEC-90
H-3 (pCi/l)
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
LLD
LLD RANGE
LLD RANGE
May-79
Feb-82
Nov-84
Aug-87
May-90
DATE

FIGURE C-5

FIGURE C-6

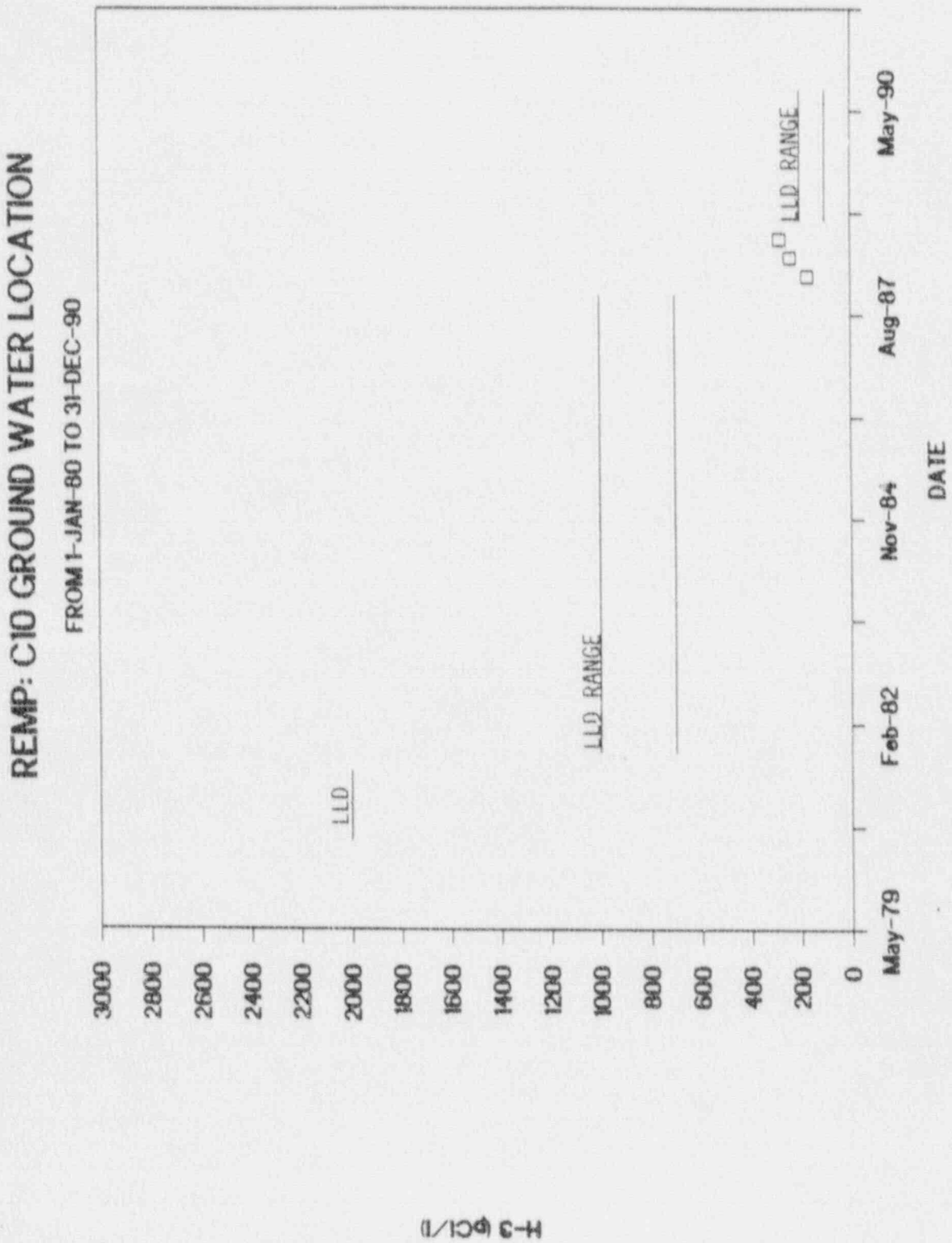
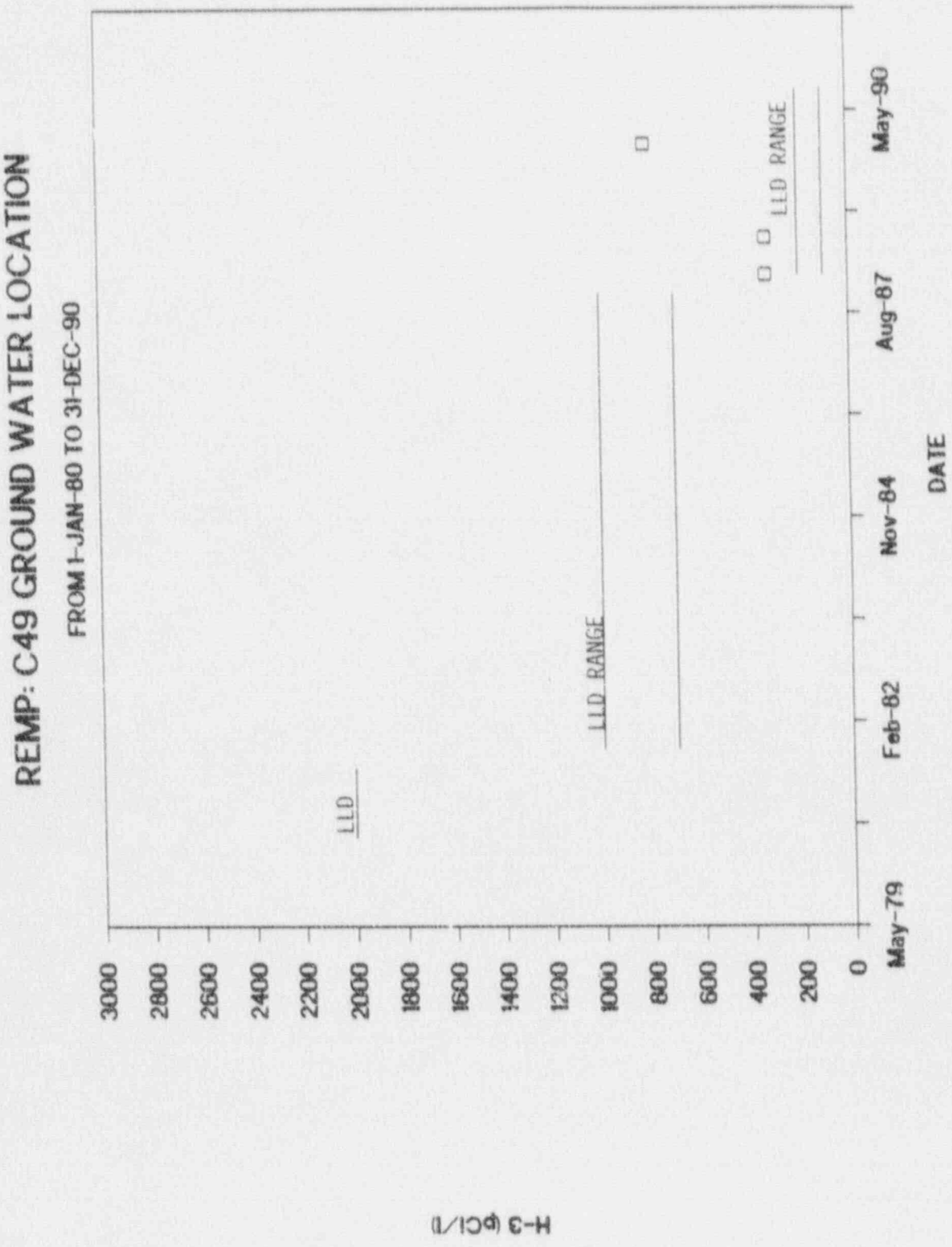

REMP: C10 GROUND WATER LOCATION
FROM 1-JAN-80 TO 31-DEC-90
LLD
LLD RANGE
LLD RANGE
H-3 (pCi/l)
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
May-79
Feb-82
Nov-84
Aug-87
May-90
DATE

FIGURE C-7


REMP: C49 GROUND WATER LOCATION
FROM 1-JAN-80 TO 31-DEC-90
LLD
LLD RANGE
LLD RANGE
H-3 (pCi/l)
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
May-79
Feb-82
Nov-84
Aug-87
May-90
DATE

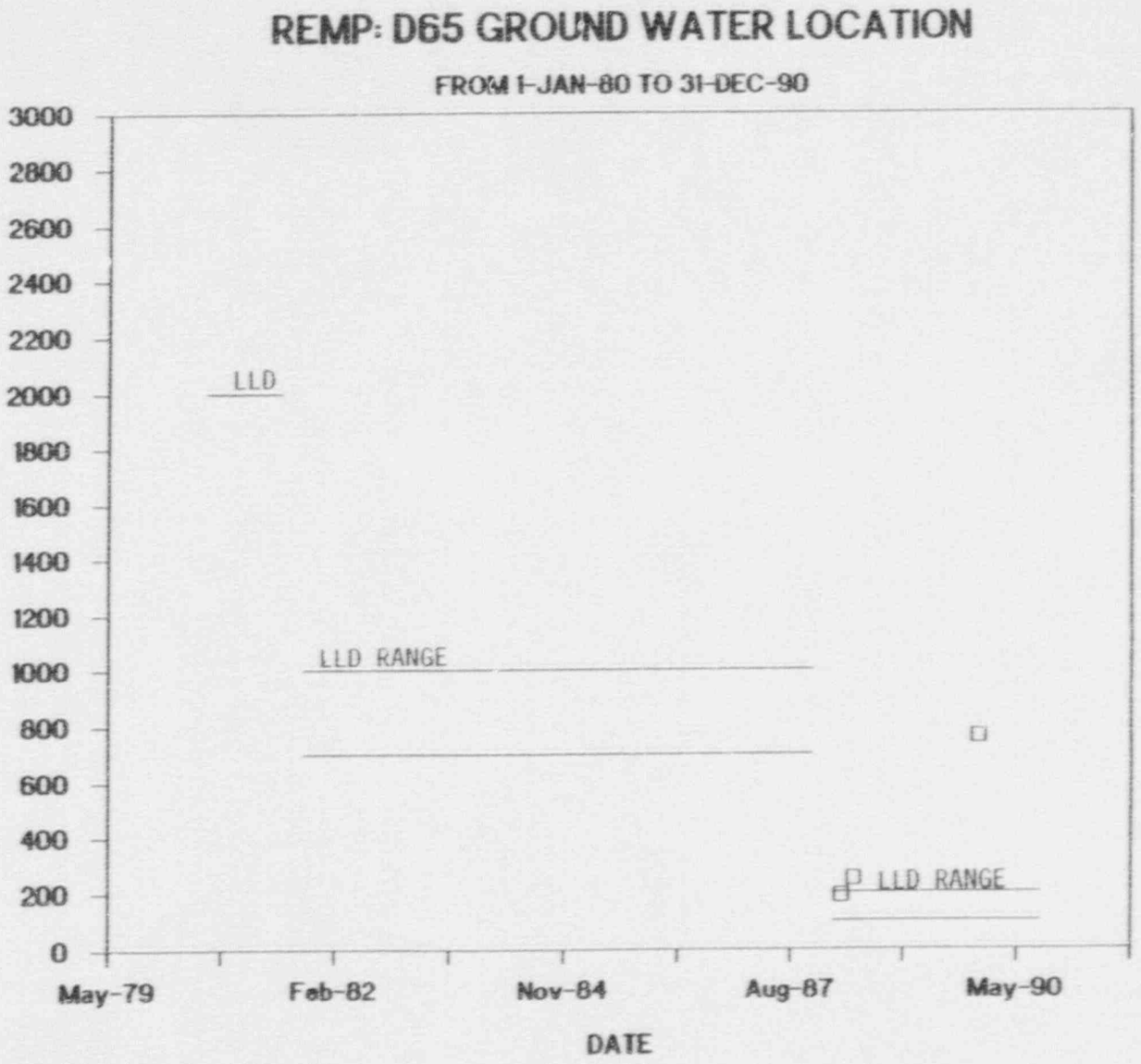

REMP: D65 GROUND WATER LOCATION
FROM 1-JAN-80 TO 31-DEC-90
H-3 (pCi/l)
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
LLD
LLD RANGE
LLD RANGE
May-79
Feb-82
Nov-84
Aug-87
May-90
DATE

FIGURE C-8

| TABLE C-4 | | | | |
|---|---|---|---|---|
| KDHE Groundwater H-3 Measurements | | | | |
| DATE | B-12 | C-12 | C-49 | D-65 |
| | pCi/l | pCi/l | pCi/l | pCi/l |
| 05/16/89 | 246 | 241 | 177 | 255 |
| 02/21/89 | -254 | -230 | 61 | -116 |
| 11/15/88 | 99 | 242 | 96 | 269 |
| 08/16/88 | 225 | 226 | 327 | 281 |
| | nCi/l | nCi/l | nCi/l | nCi/l |
| 05/17/88 | 0.2 ± 0.3 | 0.1 ± 0.3 | 0.1 ± 0.3 | 0.2 ± 0.3 |
| 02/16/88 | 0.1 ± 0.2 | 0.0 ± 0.2 | 0.0 ± 0.2 | 0.1 ± 0.2 |
| 11/17/87 | 0.0 ± 0.2 | 0.2 ± 0.2 | 0.0 ± 0.2 | 0.2 ± 0.2 |
| 08/18/87 | 0.0 ± 0.5 | 0.0 ± 0.5 | 0.0 ± 0.7 | 0.0 ± 0.5 |
| 05/19/87 | 0.0 ± 0.4 | 0.0 ± 0.3 | **0.6 ± 0.3** | **0.8 ± 0.4** |
| 02/17/87 | 0.0 ± 0.4 | **0.7 ± 0.4** | **0.9 ± 0.4** | 0.0 ± 0.4 |
| 11/18/86 | 0.2 ± 0.3 | 0.0 ± 0.3 | 0.7 ± 0.7 | 0.2 ± 0.3 |
| 08/19/86 | 0.0 ± 0.3 | 0.2 ± 0.3 | **0.9 ± 0.3** | 0.0 ± 0.3 |
| 05/20/86 | 0.4 ± 0.3 | **0.5 ± 0.2** | 0.3 ± 0.3 | **0.5 ± 0.3** |
| 02/18/86 | 0.0 ± 0.3 | 0.0 ± 0.2 | 0.1 ± 0.3 | 0.3 ± 0.3 |
| 11/19/85 | 0.0 ± 0.3 | **0.6 ± 0.3** | 0.0 ± 0.2 | 0.1 ± 0.2 |
| 08/20/85 | 0.2 ± 0.2 | 0.2 ± 0.2 | 0.1 ± 0.2 | 0.1 ± 0.2 |
| 05/21/85 | 0.0 ± 0.2 | 0.0 ± 0.2 | 0.0 ± 0.2 | 0.0 ± 0.2 |
| 02/19/85 | 0.1 ± 0.2 | 0.0 ± 0.3 | 0.1 ± 0.2 | 0.1 ± 0.2 |
| 11/19/84 | 0.1 ± 0.2 | 0.0 ± 0.3 | 0.0 ± 0.3 | 0.0 ± 0.3 |
| 08/14/84 | 0.0 ± 0.2 | 0.0 ± 0.2 | 0.1 ± 0.2 | 0.0 ± 0.2 |
| 05/22/84 | 0.0 ± 0.2 | 0.0 ± 0.2 | 0.0 ± 0.2 | 0.0 ± 0.2 |
| 02/14/84 | 0.0 ± 0.3 | 0.3 ± 0.3 | 0.0 ± 0.3 | 0.0 ± 0.3 |
| 11/08/83 | 0.0 ± 0.3 | 0.1 ± 0.3 | 0.0 ± 0.3 | 0.0 ± 0.3 |
| 08/17/83 | 0.2 ± 0.3 | 0.2 ± 0.3 | 0.1 ± 0.3 | 0.0 ± 0.2 |
| 06/17/83 | N/A | 0.1 ± 0.2 | 0.1 ± 0.2 | 0.1 ± 0.2 |

**DRINKING WATER SAMPLING**

Drinking water samples are monthly composite samples taken from the water treatment facilities at Burlington (control sample) and LeRoy (indicator sample). Tritium was detected at both of these sample locations during the third quarter composite for 1990. The tritium concentration at the control location (BW-15) was 1600 pCi/l and at the indicator location (LW-40) was 860 pCi/l. The activity measured at LeRoy was at the detection limit (700 to 900 pCi/l) with a large measurement error. The activity measured at Burlington was two times the detection capability with a relatively small error. It is believed the tritium detected at both locations are from the same source but not attributable to Wolf Creek since the activity detected upstream of WCCL discharge was greater than the activity detected downstream.