AR TARGET SHEET

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DOCUMENT # DOE/RL 92-04 Draft B

EDMC # 23657

SECTION 2 **OF** 2

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APPENDIX A

SUPPLEMENTAL DATA

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APPENDIX A.1

GEOPHYSICAL DATA

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A-1.1 INTRODUCTION

Geophysical well logging has been conducted in monitoring wells located within the 200 East and West Areas since 1954 and in the PUREX Plant Aggregate Area since at least as early as 1958. Such logging can be used to map lithologic boundaries (Additon 1978; Last et al. 1989; Brodeur and Koizumi 1989), soil moisture content (Lane 1990) and to evaluate the location and extent of radionuclides in the subsurface due to waste disposal activities (Fecht et al. 1977; Additon 1978; Brodeur 1988; Lane 1990). The geophysical borehole logging techniques that have been used include density, neutron, temperature, and gross gamma radiation logging. The most successful of these for mapping lithologic boundaries and monitoring radionuclides in the subsurface has been the gross gamma logging. The other techniques have been less successful because either they are not suitable for use in cased holes or they do not measure radiation (Lane 1990).

Previous studies based on the gross gamma logs collected from wells monitoring various waste management units in the 200 East and West Areas were conducted in 1964, 1969, 1977, 1978, 1986, and 1988. The tank farms located in the 200 East and West Areas were not considered in these reports. Additon et al. (1978) reports that the 1964 study by Raymond and McGhan discusses the disposition of radionuclides beneath most of the waste management units active between 1945 and 1963. The 1969 study (Tillson and McGhan 1969) is reported by Additon et al. (1978) to be a discussion of the waste management units where significant changes in the gamma logs were observed after 1963. The report by Fecht et al. (1977) is a qualitative study of the distribution, redistribution, and decay of radionuclides beneath approximately 100 waste management units in the 200 East and West Areas. Fecht et al. (1977) included a summary of the waste disposal history of each facility evaluated and based their conclusions on approximately 300 selected gross gamma logs collected between 1954 and 1976. Plots of the logs used were provided with the report. Additon et al. (1978) provided a complete summary of the logging systems used and a discussion of the limitations of using gross gamma logs to evaluate the distribution and composition of radionuclides in the subsurface. The methodologies used to qualitatively evaluate the gross gamma logs collected from wells monitoring the waste disposal facilities in the 200 East and West Areas were also summarized. Plots of the gross gamma logs collected from 154 monitoring wells outside the tank farms in the 200 East Area was included in the report by Additon et al. (1978). Chamness (1986) and Brodeur (1988) reviewed gross gamma logs available from selected wells in the 200 Areas and qualitatively summarized any changes in the logs between 1976 and the dates of their reports.

Thirty-one active and inactive waste management units in the PUREX Plant Aggregate Area, which are monitored by wells in which gross gamma logs are collected, were evaluated in this study. These waste management units were grouped into eight

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geographically related areas and been qualitatively evaluated in terms of the location and extent of radionuclides in the subsurface, any evidence of vertical or lateral migration, and the potential for radionuclides reaching the ground water (Figure A1-1). The results of the evaluations for these waste management units are summarized in Table A1-1. Additionally, logs from the three inactive single-shell tank farms in the PUREX Plant Aggregate Area were reviewed and the approximate extent, location and source of radionuclides in the subsurface summarized. The results of the tank farm evaluations are summarized in Table A1-1.

A-1.2 GROSS GAMMA LOGGING

Borehole gross gamma radiation measurements are used to determine the level of gamma activity with depth in the vicinity of the well bore. These measurements do not differentiate between the mechanisms through which gamma radiation is produced or the energy of the gamma radiation photons detected. The response of the gamma radiation detector to different energy levels is generally unknown, except perhaps for the lowest energy photon detectable (Arthur 1990). Gross gamma logs cannot be used to determine the isotopic composition of the subsurface since this is determined through the analysis of the energy spectra of the gamma radiation detected. The capability to measure the spectra of gamma radiation detected in the subsurface and assay the types and amounts of isotopes present is currently being developed, but has not yet reached the stage of practical application (Lane 1990; Price et al. 1990).

The bulk of the gamma logs available for the PUREX Plant Aggregate Area were collected with scintillation probes by Pacific Northwest Laboratories (PNL) or by the Tank Farm Surveillance Analysis and Support group (TFSA&S). Scintillation probes detect the flash of light produced by the interaction between a gamma photon and a crystal of thallium-activated sodium iodide (NaI(Tl)) with a photomultiplier tube. The resulting pulse of electricity is amplified, routed through a signal generator and sent through the logging cable to the surface. The pulses are separated from the electrical signal with a discriminator, amplified, counted by a rate meter and output to a pen plotter, which is driven at a rate determined by the logging speed (Fecht et al. 1977; Additon et al. 1978; Brodeur and Koizumi 1989; Arthur 1990).

The accuracy and precision of gamma activity measurements in the subsurface is determined by details of the logging system instrumentation, the field data acquisition methodology, the surrounding media, and the radionuclides present. The relationship between the gamma activity detected by a scintillation probe and the actual activity, the

distance gamma radiation may travel through geologic materials before being completely attenuated and the vertical resolution of changes in activity by the logging systems used will be discussed below.

The time required for the logging system to process a detected gamma photon, or "dead time", is an important limitation in the measurement gamma activity (Brodeur and Koizumi 1989; Arthur 1990). During this short span of time, no other photons will be processed by the instrument. The "dead time" computed for the PNL system currently in use is 17.8 microseconds (Arthur 1990). Based upon this value, the maximum count rate this logging system is capable of is about 56,000 counts per second (ct/sec). If the activity is above that level, the system will become "paralyzed" and read 0 ct/sec until it resets itself. The maximum count rate of the TFSA&S system currently in use is about 100,000 ct/sec with Probe No. 4 (Strong 1980). This suggests that the "dead time" of their logging system is about 10 microseconds. There is no evidence that TFSA&S's system will become paralyzed if this activity level is exceeded.

The actual gamma activity on an interval may be computed by multiplying the "dead time" corrected activity by a factor consistent with the amount of attenuation due to well construction. The amount of attenuation of the gamma radiation experiences in penetrating well casing is significant. A single string of casing reduces the count rate measured by the scintillation probe by about 25%, groundwater in an uncased hole reduces the observed count rate by 11%, and groundwater in a cased hole reduces the observed count rate by about 33% (Brodeur and Koizumi 1989; Arthur 1990).

The relationship between the gamma activity observed with a scintillation probe and the actual activity is linear over much of the system's range. However, above some threshold activity level, the relationship between the observed and actual activity becomes non-linear. At this point the tool is said to be saturated. The gross gamma logging system currently in use by PNL becomes saturated around 14,500 ct/sec (Brodeur and Koizumi 1989; Arthur 1990), and that currently in use by TFSA&S with Probe No. 4 becomes saturated around 70,000 ct/sec (Strong 1980).

Where the relationship between the observed and actual gamma activity is linear, and complete details of well construction are available, the activity may be converted to standard units related to decay rates or to concentrations of specific radionuclides (thorium or uranium for example). Such conversions allow the direct comparison of data collected by different logging systems and quantitative analyses of the concentrations of gamma emitters with depth. To achieve this, it is necessary to calibrate the scintillation probes used with a model bore hole containing intervals with known activities (Strong 1980; Brodeur and Koizumi 1989; Arthur 1990). The rigorous procedures and facilities necessary for calibrating scintillation probes have not yet been completed.

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A scintillation probe is calibrated by periodically adjusting the components of the system to meet established specifications and by logging a test well with intervals of known activity under standard conditions. The probe's calibration is then verified in the field before and after each logging run using portable equipment and procedures, which are correlated with those of the calibration procedure. Standard conditions are established by constructing the test bore hole in a known geologic environment with background radiation levels similar to those found in the area where the probe is used. The test well should be constructed in a similar fashion to the wells to be logged by the probe (Brodeur and Koizumi 1989).

The average distance through which gamma radiation penetrates geologic and well construction materials and is still detected by the scintillation probe is known as the radius of investigation. This distance is determined by the density of the media surrounding the bore hole, the well construction materials, and the energy and intensity of the gamma radiation. The average radius of investigation for gross gamma radiation measurements in an open hole is about 0.3 m (1 ft) from the wall of the bore hole in sedimentary rocks (Schlumberger 1972). The radius of investigation is larger on intervals where there are high concentrations of radionuclides since higher intensities of gamma radiation will penetrate a greater thickness of a given material. The radius of investigation is decreased by well casing, grout, and groundwater since they increase the effective density of sediments. Another factor in determining the radius of investigation is the tool response to low energy (frequency) gamma photons. The scintillation probe currently used by PNL has a low energy cutoff of between 46.5 and 59.5 keV (Arthur 1990). Gamma radiation with energies below this value will not be detected by that probe. The low energy cutoff for the probes used by TFSA&S is unknown.

The vertical resolution and apparent location of a change in the gamma activity measured by a scintillation probe depends upon details of how the probe signal is processed by the rate meter and the logging speed. The rate meter used in PNL's logging system differs from that used by TFSA&S. The rate meter used by PNL smooths its output using an electronic circuit (an RC circuit). The amount of smoothing is determined by the time constant of the circuit used. This removes statistical variations in the signal detected by the scintillation probe and improves the reproducibility and sensitivity of the data. However, a "lag" is introduced between the depth at which a change in the gamma activity is first encountered by the scintillation probe and the depth at which it is plotted. The size of this "depth lag" is the distance traveled before half of the amplitude of the change in activity is recorded. One time constant is required to reach 63% of the amplitude of any change in activity. So, the "depth lag" is approximately the product of the logging speed and the time constant used (Schlumberger 1972). Before 1989, the logging speed used by PNL was 4.5 m (15 ft) per minute (0.07 m, 0.25 ft per second) and the time constant used was 3 seconds. This results in a depth lag of 0.2 m (0.75 ft). The thinnest interval of elevated activity which can be resolved is also 0.2 m (0.75 ft) on these older profiles. In 1989, the logging

speed was reduced to 1.5 m/min (5 ft/min) 2.5 cm/sec (1 in./sec) and the time constant to 1 second. The expected vertical resolution and "depth lag" of these logs is 2.5 cm (1 in.). The rate meter used by TFSA&S sums the pulses over the period of time required for the probe to ascend through 0.3 m (1 ft) and averages the reading over time. This process does not remove the statistical variations from the data so the data are less reproducible. Since no time constant is used, no "lag" between the depth a change in gamma activity is encountered and the depth where it is plotted is introduced. However, the vertical resolution of changes in activity on these logs is 0.3 m (1 ft), the distance over which the activity is averaged.

A-1.3 TECHNICAL APPROACH

Scintillation probe profiles collected periodically from monitoring wells within the PUREX Plant Aggregate Area have been used to qualitatively to assess the location and extent of radionuclides in the subsurface, any evidence of vertical or lateral migration, and the potential for radionuclides from waste disposal activities reaching the groundwater. The approach used here is similar to that of Fecht et al. (1977). Scintillation probe profiles collected from wells monitoring a facility or group of facilities were compiled and analyzed in an attempt to gain an understanding of the subsurface distribution of gamma emitters from waste disposal activities. Each analysis is accompanied by a summary of the types and sources of wastes handled, the service dates and the volume of wastes disposed of or stored at a given facility. The conclusions reached in these evaluations should not be considered the final word since they are based on a limited data set, which can only be used for qualitative purposes.

The approach used here differs from that of Fecht et al. (1977) and other previous evaluations in the manner in which the data were compiled and analyzed. The thirty-one waste management units evaluated were grouped into eight geographic areas and evaluated as a whole (Figure A1-1). The three tank farms for which summary evaluations were made were accounted for three additional areas. Geological methods of analysis incorporating cross sections and mapping of subsurface attributes such as the thickness of zones of elevated gamma radiation and relevant lithologic horizons were used extensively. The advantages of this approach are the clearer representation of potential subsurface conditions around the waste disposal facilities, and identification of data deficiencies.

Fecht et al. (1977) attempted to "normalize" the scintillation probe profiles used in their evaluations to a level consistent with the profiles collected in 1976. This normalization scheme involved scaling the profiles from each vintage using an average "peak to background" ratio and bulk shifting the corrected curves to correspond to the 1976 profiles.

Since there are distinct differences between the response characteristics of each logging system and their modifications (in the saturation levels, low energy cutoff, etc), there are doubts to the validity of such an exercise. The logs used in the evaluations presented here have not been normalized.

No attempt has been made to quantitatively compare the activity levels detected by different vintages of scintillation probes in the evaluations presented here. If gross changes in the profiles are evident, they have been noted in a qualitative sense.
The criteria used to identify radionuclide decay are the significant, consistent decline of activity levels and the "narrowing" of the features representing elevated radiation on the logs over time. However, such changes may also be indicative of lateral migration of radionuclides away from a particular well. Identification of lateral migration is generally uncertain. The most reliable criteria for identifying lateral migration of radionuclides is the notable increase of activity on an interval in a well that is downgradient (of a stratigraphic or hydrologic boundary) from other wells with elevated activity on a similar interval. It is very important to consider the spacial and temporal context of the scintillation probe data in determining if lateral migration has occurred, even on a qualitative level.

Although the activity measured by the scintillation probes cannot be quantified to known standards, the activity in the subsurface may be reliably located. The location of features in the scintillation probe profiles such as the top and bottom of intervals of elevated gamma radiation are generally found at the same depth on successive logs. Care must be taken in comparing the logs collected by TFSA&S and PNL. Depth discrepancies of up to 5 feet have been noted between these logs. This error is due in part to the "depth lag" of the PNL logging system. This "depth lag" will place equivalent features on PNL logs (collected before 1989) 0.75 feet shallower than those on TFSA&S logs. Also, differences in the responses of the PNL and TFSA&S systems may account for some of this discrepancy.

Three criteria were used to establish downward migration of radionuclides in the vicinity of a well. The most important of these was an unambiguous downward displacement of the top and bottom of a region of elevated radiation with time. Downward migration of other correlatable features on an interval of elevated activity may be used in support of this evidence. Secondly, the total amount of downward migration should exceed the vertical resolution of the logging system used (0.22 m, 0.75 ft, for the PNL pre-1989 logs and 0.3 m, 1 ft, for TFSA&S logs). Finally, any change in the point from which depths are measured during logging should be identified and accounted for, this can be inferred from stationary subsurface features, such as lithologic boundaries and bottoms of casing strings.

All of the available well data were reviewed for each area evaluated, and selected logs were used to construct cross sections representative of subsurface conditions. These cross sections were correlated with stratigraphic information from nearby wells, regional cross

sections and regional mapping. Boundaries of zones of elevated gamma radiation were also marked. Any mappable attributes that could be used to represent the location and extent of the region of elevated gamma radiation were compiled into maps. The evaluation of the scintillation probe profiles referenced these graphical representations to describe the location and extent of any zones of elevated gamma radiation, and the behavior of this zone over time, particularly in regards to vertical or lateral migration. Any evidence of gamma emitters reaching the groundwater was also noted.

To represent the logs used in the cross sections in a clear, yet compact format and to facilitate comparisons between different vintages of data, it was necessary to digitize the original logs and to redisplay them on a semi-logarithmic scale. Depth in feet from the top of casing was represented on the linear scale, and activity in ct/sec on the logarithmic scale. The logs used in these evaluations which were collected before 1976, and some of the 1976 vintage logs had been previously digitized by PNL, who provided text files of the information. Unfortunately, it was not realized until late in the evaluations that the 1970 vintage and earlier logs had been plotted on a scale of counts per minute (ct/min). The reader should be aware that these logs are not plotted in ct/sec, but in ct/min. The apparent wide difference between these earlier logs and those collected in 1976 and later is due to an error in scaling. Logs plotted on a scale of ct/min were denoted on the legend for each plot of scintillation probe profiles. The cross sections are not scaled horizontally.

Features that were mapped in the evaluations for the PUREX Plant Aggregate Area include the thickness of the interval of elevated gamma radiation, the top of the elevated gamma radiation and the top of any correlatable lithologic horizon, which is useful in explaining the distribution of radionuclides in the subsurface. The most commonly used map was the thickness of the interval of elevated gamma radiation. Although such maps do not give any indication of gamma activity, they do provide a reasonable representation of the potential extent of gamma emitters. Use of activity data was avoided since the data are not suitable to be used in such a quantitative fashion.

A-1.4 EVALUATION OF WASTE MANAGEMENT UNIT AREAS

A-1.4.1 216-A-1 AND 216-A-7 CRIBS

Description of Waste: The 216-A-1 Crib received depleted uranium waste from the 202-A Building cold start-up run. The 216-A-7 Crib received the catch tank overflow waste, the sump waste, and the pump pit drainage from the 241-A-152 Diversion Box. Also, the 216-A-7 Crib received organic waste from the 202-A Building.

Service Dates: The 216-A-1 Crib was active from November through December 1955. The 216-A-7 Crib was active from November 1955 through November 1966.

Waste Volume: The 216-A-1 Crib received 98,400 L of mixed liquid waste. The 216-A-7 Crib received 326,000 L (86,000) of mixed liquid waste.

Waste Inventory:

	216-A-1		216-A-7	
	Total	Decayed Through 6/76	Total	Decayed Through 6/76
Pu (gm)	<1.0 E-1	<1.0 E-1		Not Available
Beta (Ci)	1.0 E+00	2.44 E-1		Not Available
^{90}Sr (Ci)	<1.0 E-1	<5.97 E-1		Not Available
^{106}Ru (Ci)	<1.0 E-1	<5.13 E-8		Not Available
^{137}Cs (Ci)	<1.0 E-1	<6.17 E-2		Not Available
^{60}Co (Ci)	<1.0 E-1	<6.28 E-3		Not Available
U (kg)	1.54 E+02	1.54 E+02		Not Available

Evaluation of Scintillation Probe Profiles:

Well E25-2 monitors the 216-A-1 Crib and Well E25-54 monitors the 216-A-7 Crib. Previous evaluations using the scintillation probe profiles have been done by Fecht et al. (1976) (for 216-A-1 Crib) and by Chamness (1986) (for 216-A-7 Crib). In both cases the authors concluded the level of gamma activity in the subsurface is declining. Fecht et al. also concluded that there was no measurable migration of radionuclides under the 216-A-1 Crib and that the contamination had not reached the groundwater. The following analysis is consistent with these conclusions.

Scintillation probe profiles for the 2 wells that monitor cribs 216-A-1 and 216-A-7 were compiled and roughly correlated with the stratigraphy of Well E24-5, located about 460 m (1,500 ft) to the east, and Well E26-6, located about 330 m (1,100 ft) to the north (Lindsey et al. 1990) (Figure A1-2). The data are inadequate to construct a map of the contaminant thickness and extent.

Elevated gamma radiation levels are found at two intervals in the subsurface. The upper interval is found beneath the 216-A-7 Crib from the surface to a depth of about 5 m (15 ft). The lower interval is found beneath both cribs at a depth of about 13 m (27 ft), and is about 5 m (15 ft) thick. The top of the lower interval of contamination is located at a depth consistent with that of the top of the fine-sandy facies of the Hanford formation. The

upper interval of contamination appears to coincide with an erosional surface found in the stratigraphic column of Well E26-6 (Figure A1-2).

There is no evidence of vertical or lateral migration of contaminants. However, since the top of the fine-sandy facies of the Hanford formation dips (Lindsey et al. 1990), it is unlikely that any lateral migration would be detected. Radiation levels have declined to near background levels beneath the 216-A-1 Crib, but remain significant beneath the 216-A-7 Crib.

A-1.4.2 216-A-2, -4, -21, -26, -27, -31 AND -36 CRIBS

Description of Waste:

216-A-2 Crib: Low salt, neutral/basic organic mixed waste, including normal paraffin hydrocarbons and tributyl phosphate from the 202-A Building.

216-A-4 Crib: Mixed laboratory cell drainage from the 202-A Building and 291-A-1 Stack drainage waste.

216-A-21 Crib: Low salt, neutral/basic mixed waste, including sump waste from the 293-A Building, laboratory cell drainage from the 202-A Building and 291-A-1 Stack drainage.

216-A-26 French Drain: Low-level floor drainage waste from the 291-A Fan Control House.

216-A-26A French Drain: Mixed floor drainage waste from the 219-A Fan Control House.

216-A-27 Crib: Mixed sump waste from the 293-A Building, laboratory cell drainage from the 202-A Building and 291-A-1 Stack drainage.

216-A-31 Crib: Neutral organic mixed waste from the 202-A Building.

216-A-36A Crib: Mixed ammonia scrubber waste from the 202-A Building.

216-A-36B Crib: Mixed ammonia scrubber waste from the 202-A Building.

Service Dates:

216-A-2 Crib: January 1956 to January 1963.

216-A-4 Crib: December 1955 to December 1958.

216-A-21 Crib: October 1957 to June 1958; December 1958 to June 1965.

216-A-26 French Drain: July 1965 to Present.

216-A-26A French Drain: March 1959 to July 1965.

216-A-27 Crib: June 1965 to July 1970.

216-A-31 Crib: July 1964 to November 1966.

216-A-36A Crib: September 1965 to March 1966.

216-A-36B Crib: March 1966 to October 1972; November 1982 to September 1987.

Waste Volume:

216-A-2 Crib: 230,000 L (61,000 gal).

216-A-4 Crib: 6,210,000 L (1,640,000 gal).

216-A-21 Crib: 77,900,000 L (20,600,000 gal).

216-A-26(B) French Drain: 0 L.

216-A-26A French Drain: 1,000 L (260 gal).

216-A-27 Crib: 23,200,000 L (6,130,000 gal).

216-A-31 Crib: 10,000 L (2,700 gal).

216-A-36A Crib: 1,070,000 L (283,000 gal).

216-A-36B Crib: 317,000,000 L (84,000,000 gal).

Evaluation of Scintillation Probe Profiles:

The 216-A-2, -4, -21, -27, -31, -36A, and -36B Cribs are located in the 200-PO-2 Operable Unit and the 216-A-26 and -26A French Drains in the 200-PO-1 Operable Unit. The 216-A-26(B) French Drain is the only active disposal unit in the area evaluated here. The 216-A-2 and 216-A-4 Cribs are monitored by Wells E24-53 and -54, respectively. Since the 216-A-26 and 216-A-26A French Drains are located between these cribs, they too are

monitored by these wells. The 216-A-21 Crib is monitored by Well E24-12. The 216-A-27 Crib is monitored by the E17-2 and -3 wells. Well E24-9 monitors the 216-A-31 Crib. The 216-A-36A Crib is monitored by Wells E17-4 (01-36-01), -9, and -10. The 216-A-36B Crib is monitored by Wells E17-5, -6, -7 (01-36-07), -11 (01-36-11), and -51 (01-36-06) (Fecht et al. 1977; Welty and Vermeulen 1989).

All of the monitoring wells in the area of the 216-A-2, -4, -21, -26, -27, -31, and -36 Cribs have been logged by PNL. Currently, Wells E17-4 (01-36-01), -7 (01-36-07), -11 (01-36-11), and -51 (01-36-06) are also logged on a semi-annual basis by TFSA&S (Welty and Vermeulen 1989). Details of the monitoring wells and the logs used in this evaluation are given in Table A1-3.

Scintillation probe profiles from the wells monitoring the 216-A-2, -4, -21, -26, -27, -31, and -36 Cribs have been evaluated in the past by Fecht et al. (1977), Chamness (1986) and Brodeur (1988).

Fecht et al. (1977) evaluated gross gamma logs from well monitoring the 216-A-2, -4, -21, -27, -31, -36A, and -36B Cribs and concluded that there was no evidence of significant vertical migration of gamma emitters beneath these waste management units after waste disposal activities ceased and that radionuclides from these units had not reached the water table. Fecht et al. (1977) concluded that radionuclides disposed of in the 216-A-36B Crib had not reached the southern end of the crib. This conclusion was based on the scintillation probe profiles collected from Well E17-6, which according to the Westinghouse Hanford GIS listing of well statistics and Welty and Vermeullen (1989), is located approximately 90 m (300 ft) south of the location used by Fecht et al. (1977). Some lateral migration of radionuclides was also noted under the 216-A-36B Crib.

Chamness (1986) noted that radiation levels beneath the 216-A-27 and 216-A-36A cribs was declining slowly based on logs collected in 1986.

Brodeur (1988) evaluated cribs 216-A-2, -4, -27, -31, -36A, and -36B. Brodeur (1988) noted significant levels of activity beneath cribs 216-A-2, -4, -27, -36A, and -36B, and that radionuclides probably had reached the groundwater between cribs 216-A-36A and 216-A-27. Brodeur (1988) used a log from Well E24-65 in the evaluation of 216-A-2 Crib. According to the Westinghouse Hanford GIS listing of well statistics, this well is located within the 241-A Tank Farm, a considerable distance northwest of the 216-A-2 Crib.

This evaluation concurs with Brodeur (1988) in regards to gamma emitters reaching the water table between the 216-A-27 and 216-A-36A Cribs. Fecht et al. (1977) had concluded that gamma emitters had not reached the water table in this area. This evaluation does not concur with Fecht et al. (1977) in regards to the distribution of radionuclides in the

216-A-36B Crib. The conclusions of the current evaluation on this point is based on profiles from a recently emplaced well (E17-51) located near the southern end of the 216-A-36B Crib and the coordinates for Well E17-6 from the Westinghouse Hanford GIS listing of well statistics.

Scintillation probe profiles from Wells E17-2, -3, -4, -5, -9, -10, -11, -51, E24-9, -12, -53, and -54 were compiled into four cross sections and correlated with the stratigraphy found in Well E17-4, and -12 (located about 265 m or 875 ft to the southeast), and with the regional mapping of Lindsey et al. (1992) (Figures A1-3 and A1-4). Although Wells E17-6 and -7 were not included in these cross sections, they were correlated with the stratigraphy from Wells E17-4 and -12 and used in this evaluation (Figure A1-5). The Hanford upper gravel, the Hanford sand, and the Ringold Formation are found in this area. The Hanford lower gravel may also be present on the edge of the area, in Well E17-10. The boundaries between these units are expressed as subtle features on the gamma logs from Wells E17-10, E24-9, and -12, which represent background conditions for the most part. Internal changes in facies within these units are not expressed on these background profiles.

Significant levels of gamma activity within the Hanford sand has been detected in the vicinity of the two wells monitoring the 216-A-2 and 216-A-4 Cribs and the 216-A-26 and 216-A-26A French Drains. The top of the zone of elevated radiation corresponds to the top of the Hanford sand and the base of the cribs (Figure A1-3). However, since the wells do not fully penetrate the zone of elevated radiation, the distribution of gamma emitters in that area cannot be further characterized.

The well data are adequate to characterize the distribution of radionuclides beneath cribs A-27, -36A, and -36B. The top of the elevated radiation in the immediate vicinity of these cribs corresponds to the top of the Hanford sand and the base of the cribs (6.1 to 7.6 m or 20 to 25 ft below grade) and becomes considerably deeper (16.2 to 40.5 m or 53 to 133 ft below grade) outside the confines of these cribs (Figures A1-3 and A1-4). Over most of the area, the base of the elevated activity roughly corresponds to the top of a silty interval within the Hanford sand. Elevated levels of radiation in the Ringold Formation, above the water table, are found under crib 216-A-36A and the northern and eastern ends of cribs 216-A-36B and 216-A-27, respectively. The thickness and possible extent of the elevated gamma radiation within the Hanford sand and the possible extent of elevated gamma radiation within the Ringold Formation are shown in Figure A-1.6. The approximate thickness of the elevated gamma radiation in the Hanford sand is currently 31.4 m (103 ft) near the southern end of crib 216-A-36A. In 1976, it was nearly 67 m (220 ft) thick, and the base of the interval of elevated radiation was within 4.6 m (15 ft) of the top of the Ringold Formation. This suggests that the 216-A-36A Crib was a source of gamma emitters to the groundwater before 1976. The thickness of the region of probable anthropogenic radionuclides within the Hanford sand also increases under the southern end of the 216-A-36B Crib and the 216-A-27

Crib. However, no gamma emitters are detected within the Ringold Formation in these areas.

There is evidence that the distribution of radionuclides below cribs 216-A-27, -36A, and -36B was controlled by lithologic facies changes within the Hanford sand. The scintillation probe profiles from the wells monitoring cribs 216-A-27, -36A, and -36B indicate that gamma emitters are confined to two distinct horizons within the Hanford sand beneath crib 216-A-36B and the western end of crib 216-A-27 (Figures A1-3, A1-4, and A1-5). This is manifested by two well developed peaks separated by a thin interval 2.1 to 4.6 m thick or 7 to 15 ft of near background readings found at a depth of 19.8 to 21.3 meters or 65 to 70 feet. In the past, gamma levels were much higher within this thin interval, but the character of the logs has remained consistent. This "notch" can be explained by postulating a thin, discontinuous lense of coarse grained material within the Hanford sand. Such a lense could act as a "leaky" barrier to the movement of wastes in the subsurface (Additon et al. 1978). Vertical movement would be inhibited because capillary attraction would prevent movement from less permeable to more permeable sediments. The scintillation profiles from Wells E17-2, -5, -7, -9, -11, and -51 (Figures A1-3, A1-4 and A1-5) indicate that this postulated lense is a synform whose axis is located between Wells E17-5 and -51 and plunges toward the northwest. This is consistent with deposition at the bottom of a river channel in an alluvial environment and the regional mapping of Lindsey et al. (1992). The profiles from Wells E17-3 and E17-4 do not have this "notched" character and the depth to the top of the elevated gamma activity is considerably deeper (Figures A1-3 and A1-4). This suggests that the postulated lense is absent in that area so radionuclides could penetrate to a greater depth. The edge of this postulated lense corresponds to increased gamma radiation levels in the Ringold Formation (Figure A1-3 and A1-4).

The wells monitoring cribs 216-A-21 and 216-A-31 do not appear to be optimally placed. The regional mapping of Lindsey et al. (1992) and the distribution of radionuclides beneath cribs 216-A-27, -36A, and -36B (Figure A1-6) suggest that potential contaminants may be found northwest of these cribs.

There is no evidence of lateral or vertical migration of radionuclides after their emplacement beneath cribs 216-A-2, -4, -27, -36A, and -36B. The only changes in the scintillation probe profiles from the wells monitoring these structures over time has been a thinning of the peaks due to radionuclide decay.

Scintillation profiles from all the wells reaching the water table indicate that although elevated gamma radiation was detected in the groundwater under cribs 216-A-21, -27, -31, -36A, and -36B prior to the 1976 logging campaign (Fecht et al. 1977), levels are currently at or near background levels.

A-1.4.3 216-A-5, -10, -15, AND -38 CRIBS

Description of Waste:

216-A-5 Crib: Process condensate (mixed waste) from the 202-A Building.

216-A-10 Crib: Process condensate (mixed waste) from the 202-A Building.

216-A-15 French Drain: Acidic mixed waste.

216-A-38 Crib: Never used.

Service Dates:

216-A-5 Crib: December 1955 to November 1961; October 1966.

216-A-10 Crib: 1956 (received non-radioactive water); November 1961 to January 1978; October 1981 to March 1987.

216-A-15 French Drain: December 1955 to 1972.

216-A-38 Crib: Never used.

Waste Volume:

216-A-5 Crib: 1,630,000,000 L (431,000,000 gal).

216-A-10 Crib: 3,210,000,000 L (979,000,000 gal).

216-A-15 French Drain: 10,000,000 L (2,642,000 gal).

216-A-38 Crib: 0 L.

Evaluation of Scintillation Probe Profiles:

The 216-A-5, -10, and -38 Cribs and the 216-A-15 French Drain are all located within the 200-PO-2 Operable Unit, south of building 202-A. The 216-A-5 Crib is monitored by Wells E24-1, -10, -56, -57, and -58. The 216-A-10 Crib is monitored by Wells E17-1, E24-2, -15 (01-10-02), -59 (01-10-03), -60 (01-10-09), and -160 (01-10-01). No wells are positioned to monitor the 216-A-15 French Drain. The 216-A-38 Crib is monitored by Wells E17-8 and E24-11. Except for Well E24-15, each of these monitoring

wells have been logged by PNL. Wells E24-59, -60, and -160 are also logged by TFSA&S on a semi-annual basis. Well E24-15 was monitored by TFSA&S before it was taken out of service. Details of the monitoring wells and scintillation probe profiles used in this evaluation are given in Table A1-4.

The 216-A-5, -10, and -38 Cribs were evaluated by Fecht et al. (1977), and the 216-A-5 and 216-A-38 Cribs were also evaluated by Brodeur (1988). No previous evaluations are available for the 216-A-15 French Drain. Fecht et al. (1977) and Brodeur (1988) both noted significant levels of gamma radiation in the vadose zone and in the groundwater beneath the 216-A-5 Crib. Both studies conclude that radionuclides from the 216-A-5 Crib may have reached the groundwater. Fecht et al. (1977) similarly concluded that radionuclides from the 216-A-10 Crib may also have reached the groundwater. Elevated gamma activity under the 216-A-38 Crib at a depth of about 30.5 m (100 ft) was observed by Fecht et al. (1977). Since that crib had never been used, this activity was attributed to lateral migration of radionuclides from the 216-A-10 Crib. Brodeur (1988) noted that elevated gamma radiation is evident only in the groundwater beneath the 216-A-38 Crib. The results of this evaluation do not differ significantly from those of Fecht et al. (1977) and Brodeur (1988).

Except for Wells E24-2 and -11, the wells monitoring the 216-A-5, -10, and -38-1 Cribs were compiled into three cross sections and correlated with the stratigraphy from Wells E17-4, located about 160 m (535 ft) to the northwest; E17-12, located about 350 m (1,150 ft) south-southwest; and E24-5, located about 600 m (1,960 ft) north-northwest (Lindsey et al. 1992) (Figure A1-7). This correlation should be considered fair since the changes in lithology have very subtle expression on the gamma logs and the regional mapping by Lindsey et al. (1992) is not detailed on the scale used in this evaluation.

Significant levels of gamma radiation are found under the 216-A-5 and 216-A-10 Cribs. The top of the interval of containing probable anthropogenic radionuclides is found between 9.1 to 11.9 m (30 to 39 ft) below the surface, and the bottom of this interval at a depth of about 53.4 m (175 ft). The top of the elevated gamma radiation is correlated with the top of the Hanford sand in Well E24-10, adjacent to the 216-A-5 Crib (Figure A1-7). Elsewhere, the top of the elevated activity does not correspond to a particular lithologic unit (Figure A1-7). The base of the elevated radiation appears to be controlled by the top of a silty interval found within the Hanford sand (Lindsey et al. 1992). The "sawtoothed" character of the scintillation probe profiles from wells that penetrate the interval of elevated activity suggest that this silty interval inhibited but did not stop the downward migration of gamma emitters (Figure A1-7).

In the evaluations of the 216-A-5 and 216-A-10 Cribs by Fecht et al. (1977) and Brodeur (1988), secondary peaks were noted in the scintillation probe profiles from wells in

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the area. Fecht et al. (1977) attributed these secondary peaks to the relatively high retention of gamma emitting radionuclides in fine grained sediments versus that of coarse grained sediments. The well data are inadequate to further characterize these postulated lenses of fine grained material.

The current gross thickness and probable extent of the interval of elevated gamma radiation was mapped (Figure A1-8). This map suggests that the gamma emitters from the 216-A-10 Crib merged with those from the 216-A-5 Crib to the west. This is consistent with the dip of the top of the Hanford sand in this area (Lindsey et al. 1992). There is no explicit evidence of the presence of gamma emitters from the 216-A-15 French Drain. However, the "spreading" of the contours near Well E24-57 and the 13.4 m (44 ft) disposal depth for the 216-A-15 French Drain suggests that there may be some influence on the shape of the region of elevated gamma activity due to radionuclides from the 216-A-15 French Drain.

The extent of the elevated gamma radiation in the subsurface toward the east may have been influenced by the lateral migration of radionuclides from the 216-A-10 Crib when it was active. Fecht et al. (1977) proposed that elevated gamma radiation observed at a depth of about 21.3 m (70 ft) in Well E17-8 was due to gamma emitters migrating laterally from the 216-A-10 Crib. However, to reach the 216-A-38 Crib from the 216-A-10 Crib, gamma emitters would have had to travel up the regional dip of the top of the Hanford sand (Lindsey et al. 1992). The available scintillation profiles from Well E17-8 indicate that gamma activity on this interval had declined to near background levels by 1976. Brodeur (1988) observed no subsequent changes in the profiles for Well E17-8 on this interval. Based on the available data, only small quantities, if any, of radionuclides from the 216-A-10 Crib reached the 216-A-38 Crib area.

Currently, the gamma radiation levels measured by scintillation probes in the groundwater beneath the 216-A-5, -10, -15, and -38 Crib areas are at or near background levels. However, the scintillation probe profiles from Wells E24-10 and E17-1, which monitor the 216-A-5 and 216-A-10 Cribs, respectively, suggest that gamma emitters did reach the groundwater between 1958 and 1979 (Figure A1-7).

There is no evidence that gamma emitters placed in the 216-A-5 and 216-A-10 Cribs are currently migrating laterally or vertically in the subsurface. The location of features on the scintillation probe profiles from the wells monitoring the cribs have remained constant over time (Figure A1-7). The consistent reduction in the amplitude of features on the profiles over time indicates that radionuclide decay is occurring.

A-1.4.4 216-A-6 CRIB

Description of Waste: Steam condensate, equipment disposal tunnel floor drainage, water filled door drainage and the slug storage basin overflow waste from the 202-A Building.

Service Dates: 1955 to 1961, 1966 to 1970.

Waste Volume: 3,400,000,000 L (898,000,000 gal).

Evaluation of Scintillation Probe Profiles:

Wells E25-3 and -53 monitor the 216-A-6 Crib. Details of these wells and the scintillation probe profiles used in this evaluation are given in Table A-1.5.

The scintillation probe profiles for Wells E25-3 and -53 have been evaluated by Fecht et al. (1977), Chamness (1986) and Brodeur (1988). Fecht et al. (1977) observed elevated levels of gamma radiation at the surface and between 6.1 to 12.2 m (20 to 40 ft) below the surface. Chamness (1986) noted that the 1986 profile for Well E25-53 did not differ from previous logs. Brodeur (1988) found no change in the character of the 1987 profiles from earlier profiles for both Wells E25-3 and -53. Brodeur (1988) also observed elevated activity at a depth of 10.7 m (35 ft). This evaluation is consistent with these previous reports.

A cross section was constructed from the compiled scintillation probe profiles from Wells E25-3 and 53 (Figure A1-9). The profiles were roughly correlated with the stratigraphy from Wells E24-5 and E17-4 (Lindsey et al. 1992), located approximately 670 m (2,200 ft) northeast and southeast of the 216-A-6 Crib, respectively.

Elevated gamma radiation was detected at a depth between 6.1 to 12.2 m (20 to 40 ft) in Well E25-3. Slightly elevated radiation levels are also detected in Well E25-53 between 6.1 to 12.2 m (20 to 40 ft). The top of the elevated activity is correlated with the top of the Hanford sand in this area (Lindsey et al. 1992). The distribution of the elevated gamma radiation levels is consistent with the northwesterly regional dip of the top of the Hanford sand (Lindsey et al. 1992).

There is no evidence of vertical migration of radionuclides from the 216-A-6 Crib. The data are inadequate to assess the lateral extent of contaminants in the subsurface down dip from the 216-A-6 Crib.

A-1.4.5 216-A-8, -18, -19, -20, -24, AND -34 CRIBS

Description of Waste:

216-A-8 Crib: Condensate storage tanks in the 241-A Tank Farms and cooling water from the contact condenser in the 241-A-431 Building.

216-A-18 Trench: Depleted uranium mixed waste from the 202-A Building.

216-A-19 and -20 Trenches: Contact condenser cooling water from the 241-A-431 Building and depleted uranium mixed waste from the 202-A Building.

216-A-24 Crib: Condensate from waste storage tanks in the 241-A and 241-AX Tank Farms (low salt mixed waste).

216-A-29 Ditch: Acid fractionator condensate, condenser cooling water, process cooling water, seal cooling water (from air sampler vacuum pumps) and chemical sewer waste from the 202-A Building enroute to the 216-B-3 Pond.

216-A-34 Ditch: Cooling water from the contact condenser in the 241-A-431 Building enroute to the 216-A-19 and -20 Trenches (mixed waste).

216-A-524 Control Structure: Mixed waste, radioactive concrete and piping, details not available.

Service Dates:

216-A-8 Crib: November 1955 to May 1958; January 1966 to April 1976; January 1978 to April 1978; October 1983; March 1984 to 1991.

216-A-18 Trench: November 1955 to January 1956.

216-A-19 and -20 Trenches: November 1955 to January 1956.

216-A-24 Crib: May 1958 to January 1966; inadvertently used 1966 to 1979.

216-A-29 Ditch: November 1955 to 1991.

216-A-34 Ditch: November 1955 to December 1957.

216-A-524 Control Structure: 1957 to January 1966.

Waste Volume:

216-A-8 Crib: 1,150,000,000 L (304,000,000 gal).

216-A-18 Trench: 488,000 L (129,000 gal).

216-A-19 Trench: 1,100,000 L (291,000 gal).

216-A-20 Trench: 96,000 L (25,000 gal).

216-A-24 Crib: 820,000,000 L (217,000,000 gal).

216-A-29 Ditch: 10,400,000,000.

216-A-34 Ditch: No information available.

216-A-524 Control Structure: No information available.

Evaluation of Scintillation Probe Profiles:

The 216-A-8 and 216-A-24 Cribs, 216-A-18, -19, and -20 Trenches, 216-A-29 and 216-A-34 Ditches, and the 216-A-524 Control Structure are all located within the 200-PO-5 Operable Unit, east of the 241-A and 241-AX Tank Farms. The 216-A-8 Crib is monitored by Wells E25-4 (01-08-08), -5 (01-08-09), -6 (01-08-07), -7 (01-08-10), -8 (01-08-03), -9, and -14. The 216-A-18, -19, and -20 Trenches and the 216-A-34 Ditch are monitored by Well E25-10. The 216-A-24 Crib is monitored by Wells E26-2, -3, -4, -5, -7, -53, and -54. The 216-A-29 Ditch is monitored by Wells E25-28 and -169. No monitoring wells are located near the 216-A-524 Control Structure. All of these monitoring wells have been logged by PNL. Wells E25-4 (01-08-08), -5 (01-08-09), -6 (01-08-07), -7 (01-08-10), and -8 (01-08-03) are currently logged by TFSA&S on a semi-annual basis (Welty and Vermeulen 1989). Details of the monitoring wells are given in Table A1-6.

The 216-A-8 Crib has been evaluated by Fecht et al. (1977). They concluded that no measurable migration of radionuclides has occurred beneath this crib and that breakthrough to the groundwater has not occurred. The conclusions of this evaluation differ from those of Fecht et al. (1977) on both points.

The 216-A-24 Crib has been evaluated by Fecht et al. (1977), Chamness (1986) and Brodeur (1988). Fecht et al. (1977) concluded that measurable downward migration of contaminants occurred beneath the 216-A-24 Crib during waste disposal activities. They also concluded that gamma emitters have reached the water table under the western end of the

216-A-24 Crib. Chamness (1986) reported that by 1986, activity in the vadose zone had decayed to background levels. Brodeur (1988) also reported background levels in the vadose zone. The activity detected between 61 to 73.2 m (200 to 240 ft) in depth reported by Brodeur (1988) is probably due to changes in lithology at that depth. The conclusions of this evaluation for the 216-A-24 Crib are consistent with the previous studies.

Scintillation probe profiles from wells monitoring the 216-A-18, -19, and -20 Trenches, the 216-A-29 and 216-A-34 Ditches, and the 216-A-524 Control Structure have not been previously evaluated.

Except for Wells E25-6, -28, and E26-54, the wells monitoring the 216-A-8 and 216-A-24 Cribs, the 216-A-18, -19, and -20 Trenches, and the 216-A-29 and 216-A-34 Ditches were compiled into three cross sections and correlated with the lithologic column for Well E26-6 (Lindsey et al. 1992) and the regional mapping of Lindsey et al. (1992) (Figures A1-10 and A1-11). There is a discrepancy between the location of Well E25-6 given by the GIS coordinates used to construct the basemap and that used on the TFSA&S map (Welty and Vermeulen 1989). The elevation for the top of casing of 207 m (680 ft) given by the GIS listing for Well E25-14 is probably incorrect. The top of casing of 2 nearby Wells (E25-4 and 5) are both less than 200 m (660 ft). On cross section B-B' (Figure A1-10), the scintillation probe profile for well E25-14 was positioned to reflect a more consistent top of casing. Although the expression of the lithologic changes is subtle on the scintillation profiles in this area, the correlation may be considered good since well E26-6 is located adjacent to the area (about 175 m or 600 ft west of the 216-A-24 Crib).

Significant levels of gamma radiation are currently found beneath the 216-A-8 and 216-A-24 Cribs and the 216-A-29 Ditch. The thickness and estimated extent of these regions of elevated gamma radiation are shown in Figure A1-12. Except in Wells E25-14 (monitoring the 216-A-8 Crib) and E26-7 (monitoring the 216-A-24 Crib), the region of elevated gamma radiation is confined to the lower of 2 upward-fining sequences, which comprise the Hanford upper gravel in this area (Lindsey et al. 1992). The top of this lower sequence is 3 to 8.2 m (10 to 27 ft) below the surface and the bottom at 15.2 to 21.3 m (50 to 70 ft) below the surface (Figures A1-10 and A1-11). The highest levels of gamma radiation are currently detected at the top of this lower sequence and, except in Wells E25-14 and E26-7, decline to background levels at its base. In the vicinity of Wells E25-14 and E26-7, elevated radiation levels are detected well into the Hanford sand.

The existing data from wells monitoring the 216-A-8 Crib are inadequate to fully define the lateral extent and potential for lateral migration of radionuclides in the subsurface. The map representing the thickness and extent of radionuclides in the subsurface is poorly constrained north and northeast of the 216-A-8 Crib due to lack of well control (Figure A1-12). No wells have been placed north of the 216-A-8 Crib, near potential contributors

(the 216-A-18, -19, -20, and -34 waste management units) to the elevated activity detected, and no wells have been placed northeast of the 216-A-8 Crib, down the regional dip of the top of the Hanford sand.

The increased thickness of the interval of elevated gamma activity under the 216-A-8 Crib in the vicinity of Well E25-14 (Figure A1-12) suggests that the radionuclides placed in the crib have moved southward. This is not consistent with the northeasterly regional dip of the top of the Hanford sand (Lindsey et al. 1992). Although the cross sections in Figures A1-10 and A1-11 are consistent with the regional mapping of Lindsey et al. (1992), the correlations used are open to interpretation. It is possible that locally, the top of the Hanford sand dips toward the south. An alternative interpretation is that Well E25-14 was not properly constructed and serves as a conduit for the downward migration of contaminants. This would explain the inconsistent location of the thickest interval of elevated radiation relative to the 216-A-8 Crib and the regional dip of the Hanford sand. Also, the inconsistent character of the profiles from Well E25-14 relative to those from the surrounding wells could be explained by the difference in the pathways into the subsurface followed by the gamma emitters (Figure A1-10).

There is evidence of measurable downward migration of contaminants under the 216-A-8 Crib. Peaks and troughs in the profiles for Wells E25-4, -5, -7, and -14 show a downward displacement of about 1 m (3 ft) over 5 years (Figure A1-10) within the Hanford upper gravel. The development of a secondary peak at a depth of 50 to 55 m (165 to 180 ft) on the 1982 scintillation probe profile for Well E25-14 (Figure A1-10) is additional evidence of vertical migration of gamma emitters. Increasing radiation levels detected near the bottom of the 1987 profile (at a depth of 44 m or 145 ft) suggest that the peak is broadening. Currently, all of the wells monitored by TFSA&S are only logged to a depth of 45.7 m (150 ft), which is inadequate to detect this secondary peak.

Currently, there is no evidence that gamma emitters reach the water table under the 216-A-8 Crib. However, logs collected in 1958 from the wells monitoring this crib show levels of activity 2 or 3 orders of magnitude above background levels for logs of this vintage within the Ringold Formation and approaching the water table (Figure A1-10).

The lateral extent of elevated gamma radiation beneath the 216-A-24 Crib is adequately constrained by surrounding wells (Figure A1-12). Fecht et al. (1977) noted that there was measurable downward migration of contaminants under the western end of this crib when it was active. There is no evidence of downward migration of gamma emitters on more recent profiles (Figures A1-10 and A1-11). The extreme thickness of the interval of elevated gamma activity in Well E26-7 relative to that of detected other, nearby wells suggests that the well bore itself may be a conduit for downward migration of radionuclides (Figure A1-12). The increase in activity from 1968 levels measured in Well E26-7 in 1976

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while all of the other wells monitoring the 216-A-24 Crib had lower levels of activity is further evidence that Well E26-7 may be improperly constructed (Figure A1-13).

Currently there is no evidence that gamma emitters reach the water table under the 216-A-24 Crib. However, levels of activity well above background levels were detected within the Ringold Formation in 1958 (Figures A1-10, A1-11 and A1-13). The proximity of elevated radiation levels to the water table suggests that radionuclides may have reached the groundwater under this crib.

There is evidence of gamma emitters from the 216-A-29 ditch in the subsurface. A thin interval 4 m (13 ft) of elevated gamma radiation is detected in Well E25-169 and background levels are detected in Well E25-28 (Figure A1-12). Since background gamma radiation levels are measured in Wells E25-8 and E25-9, at the eastern end of the 216-A-8 Crib and there are no other waste management units in the area, it is likely that the source of the gamma emitters detected in Well E25-169 is the 216-A-29 Ditch. The data from Wells E25-28 and E25-169 are inadequate to further constrain the extent of gamma emitters under the 216-A-29 Ditch.

A-1.4.6 216-A-9 CRIB AND 216-A-40 TRENCH

Waste Description:

216-A-9 Crib: Acid fractionator condensate and condenser cooling water from the 202-A Building; N Reactor decontamination waste.

216-A-40 Trench: Cooling water and steam condensate from the 244-AR Vault.

Service Dates:

216-A-9 Crib: March 1956 to February 1958; April 1966 to October 1966; August 1969.

216-A-40 Trench: January 1968 to 1979.

Waste Volume:

216-A-9 Crib: 981,000,000 L (259,000,000 gal).

216-A-40 Trench: 946,000 L (250,000 gal).

Evaluation of Scintillation Probe Profiles:

Both the 216-A-9 Crib and the 216-A-40 Trench are located within the 200-PO-1 Operable Unit, west of the 241-A and 241-AX Tank Farms. The 216-A-9 Crib is monitored by Wells E24-3, -4, -5, and -63. The 216-A-40 Trench is monitored by the E27-3 well, located about 45.7 m (150 ft) off the northern end of the trench. Details of the monitoring wells and scintillation probe profiles used in this evaluation are given in Table A-1.7.

The 216-A-9 Crib has been evaluated in the past by Fecht et al. (1977) and Chamness (1986). No previous evaluations are available for the 216-A-40 Trench. Fecht et al. (1977) reported that the region of elevated gamma radiation under the 216-A-9 Crib detected in 1963 had declined to near background levels by 1976. Chamness (1986) found no further change in the conditions under the 216-A-9 Crib in the profile from well E24-63 collected in 1986. The conclusions of the current evaluation does not differ from those of the previous studies.

The scintillation probe profiles from the wells monitoring the 216-A-9 Crib were compiled into a cross section and correlated with the stratigraphic column available from Well E24-5 (Lindsey et al. 1992) (Figure A1-14). The well monitoring the 216-A-40 Trench was also correlated with the stratigraphic column for Well E24-5 (located about 230 m or 750 ft to the south-southwest) (Figure A1-14). Although Well E24-5 is within the area evaluated, the lithographic correlations are only fair because the changes in lithology have very subtle or no expression on the scintillation profiles, and the regional mapping of Lindsey et al. (1992) is not detailed on the scale used in this evaluation.

Currently, there is no evidence of elevated gamma radiation beneath the 216-A-9 Crib and the 216-A-40 Trench. Based upon the regional dip of the top of the Hanford sand (Lindsey et al. 1992), which probably controls the lateral distribution of radionuclides from the waste management units, the wells near the 216-A-9 Crib are well placed to detect the presence of gamma emitters in the subsurface. Although the well monitoring the 216-A-40 Trench is also down dip, it may be too far from the trench (45.7 m or 150 ft off the northern end of the trench) to detect any gamma emitters from the trench.

A-1.4.7 216-A-30, -37, AND -42 CRIBS

The crib statistics were taken from Fecht et al. (1977) unless otherwise noted.

9 2 1 2 6 3 1 1 8 2

Description of Waste:

216-A-30 Crib: Low-level liquid waste from the 202-A Building; steam condensate, equipment disposal tunnel floor drainage, water filled door drainage and slug storage basin overflow.

216-A-37-1 Crib: Low-level process condensate from the 242-A Evaporator.

216-A-37-2 Crib: Low-level steam condensate from the 202-A Building.

216-A-42 Retention Basin: Chemically or radioactively contaminated diversions from the PUREX sewer line cooling water line and steam condensate discharge. Depending on treatment required for waste, it may be released to the 216-A-30 and 216-A-37-2 Cribs, to PUREX process piping or to the tank farms.

Service Dates:

216-A-30 Crib: January 1961 to November 1965; January 1970 to 1991.

216-A-37-1 Crib: March 1977 to 1991.

216-A-37-2 Crib: 1983 to Present.

216-A-42 Retention Basin: September 1978 to Present.

Monitoring Frequency:

216-A-30 Crib: Semi-Annual.

216-A-37-1 & 2 Cribs: Semi-Annual.

216-A-42 Retention Basin: Not Monitored Regularly.

Waste Volume:

216-A-30 Crib: 7,110,000,000 L (1,880,000,000 gal).

216-A-37-1 Crib: 377,000,000 L (99,600,000 gal).

216-A-37-2 Crib: 1,090,000,000 L (288,000,000 gal).

216-A-42 Retention Basin: Not Applicable.

Evaluation of Scintillation Probe Profiles:

The 216-A-30, -37-1, and -37-2 Cribs and the 216-A-42 Retention Basin are located within the 200-PO-4 Operable Unit. Each of these 4 units are active. The 216-A-30 Crib is monitored by Wells E16-2, E25-11, -12 (01-30-06), -190 (01-30-11), -191 (01-30-23) and -193 (01-30-03) (Fecht et al. 1977; Welty and Vermeulen 1989). The 216-A-37-1 Crib is monitored by Wells E25-17, -18 (01-37-11), -19 (01-37-05), and -20 (Welty and Vermeulen 1989). Well E25-17 is also in a location suitable to monitor the 216-A-42 Retention Basin. The 216-A-37-2 Crib is monitored by Wells E25-21, -22 (01-37-22), -23 (01-37-17), and -24 (Welty and Vermeulen 1989). The location of the 216-A-37-2 Crib does not agree with that shown by Welty and Vermeulen (1989).

Scintillation probe profiles have been collected for most of these wells by PNL or Westinghouse's TFSA&S. Wells E25-12, -17, -18, -190, -191, and -193 are currently logged by TFSA&S on a semi-annual basis (Welty and Vermeulen 1989). Well E25-19 has been taken out of service (Welty and Vermeulen 1989). The PNL has logged Wells E16-2, E25-17, -18, -19, and -20. Wells E25-37 and -38, which are northwest of the 216-A-30, -37 and -42 Crib area, have also been logged by PNL. There are no profiles available for the wells monitoring the 216-A-37-2 Crib (Wells E25-21, -22, -23, and -24). Details of the monitoring wells and the logs used in this evaluation are given in Table A1-8.

The only available previous evaluation of scintillation probe profiles from the monitoring wells in the 216-A-30, -37, and -42 area is that of Fecht et al. (1977) for the 216-A-30 Crib. They found that the low levels detected in 1963 had declined to near background levels. They found no evidence of radionuclide migration beneath the 216-A-30 Crib and concluded that breakthrough to the groundwater had not occurred. The present evaluation does not address the issue of the 1963 contamination since levels had reached background by 1976 and there is no evidence of migration of radionuclides.

Scintillation probe profiles from Wells E16-2, E25-12, -17, -18, -19, -190, -191, and -193 were compiled into two cross sections (Figure A-12). These cross sections were roughly correlated with the stratigraphy from Wells E17-12 and E26-6 (Lindsey et al. 1990), located 1,130 m (3,720 ft) east and 820 m (2,700 ft) north, respectively, and with the regional mapping of Lindsey et al. (1990). This correlation must be considered poor since the wells are very far from the area evaluated, the mapping of Lindsey et al. (1990) is not detailed on the scale used and the lithologic boundaries do not have a clear signature on the gamma logs in this area.

9 2 1 2 6 3 1 1 8 4

Low to moderate levels of gamma radiation is detected under the 216-A-30 Crib (Figure A1-12). The potential extent and thickness of the region of elevated gamma radiation is shown in Figure A1-13. The top of this plume corresponds to the base of the 216-A-30 Crib, within the Hanford Upper Gravel and the base of the plume is at or near the top of the Hanford Sand (Figure A1-12). The northwesterly location of this plume relative to the 216-A-30 Crib implies that the lateral migration of radionuclides during emplacement is controlled by the regional dip of the top of the Hanford Sand (Lindsey et al. 1990).

There is evidence that the region of elevated gamma radiation under the 216-A-30 Crib is currently migrating in a vertical direction. The peaks on the scintillation profiles from wells E25-190, -191, and -193 have broadened and moved downward 0.3 to 1.5 m (1 to 5 ft) in the 8 years between 1982 and 1990 (Figure A1-12).

Background levels of gamma radiation were detected in the vicinity of the wells monitoring the 216-A-37-1 Crib and 216-A-42 Retention Basin. The wells monitoring these structures are well placed to detect any laterally migrating radionuclides (assuming the 216-A-42 Retention Basin is properly located) given the northwesterly dip of the top of the Hanford Sand in this area and the behavior of the contaminant plume from the 216-A-30 Crib.

Since there are no scintillation probe profiles available for the wells monitoring the 216-A-37-2 Crib, no evaluation could be done of this active unit.

A-1.4.8 216-A-45 CRIB

Description of Waste: Process condensate (low-level waste) from the 202-A Building.

Service Dates: March 4, 1987 to 1989.

Monitoring Frequency: Semi-Annual.

Waste Volume: 103,000,000 L (27,000,000 gal).

Evaluation of Scintillation Probe Profiles:

The 216-A-45 Waste Management Unit is an active crib monitored by Wells E25-12, -13, -53 (01-45-04) and -54 (01-45-10). Wells E25-53 and 54 are logged by TFSA&S on a semi-annual basis (Welty 1988). Wells E25-12 and -13 were last monitored by PNL in 1986, prior to the commencement of waste disposal activities. Details of the monitoring wells and scintillation probe profiles used in this evaluation are given in Table A1-9.

Scintillation probe profiles from the wells monitoring the 216-A-45 Crib have not been previously evaluated.

Scintillation probe profiles from Wells E25-53 and E25-54 were compiled into a cross scetion and roughly correlated with a stratigraphic column for Well E25-12 (Lindsey et al. 1992) (Figure A1-17). Since the scintillation probe profile for E25-12 was collected before wastes were placed in the 216-A-45 Crib, it represents background conditions in the subsurface. Subtle changes in the profile for Well E25-12 correspond to the top of the Hanford sand, the top of the Hanford lower gravel and the top of the Ringold Formation (Figure A1-17). Internal facies changes of these lithologic units are not expressed on the gamma logs.

Elevated gamma radiation (2 to 3 times background levels) is evident in Wells E25-53 and E25-54 from a depth of about 12.2 m (40 ft) to the bottom of the wells (Figure A1-17). The top of the elevated radiation corresponds to the base of the crib and to the top of the Hanford sand. A secondary peak appears to be developing at a depth of about 32 m (105 ft) in Well E25-53. This can be correlated with the top of a silty interval within the Hanford sand.

The vertical extent of elevated gamma radiation beneath cannot be determined from these data since Wells E25-53 and E25-54 do not penetrate the region of elevated activity and no current scintillation probe profiles are available for Wells E25-12 and E25-13. However, assuming that background conditions existed in the subsurface before waste disposal activities commenced, the current interval of elevated radiation detected in wells E25-53 and E25-54 is good evidence of vertical migration of radionuclides.

Although the lateral extent of contaminants in the 216-A-45 Crib area cannot be determined from these data, the potential for lateral migration can be assessed. Such migration is likely to be controlled by the dip direction of the top of the Hanford sand and the silty interval within the Hanford sand. The top of the Hanford sand is dipping to the northeast according to the regional mapping of Lindsey et al. (1992). Since the top of the Hanford Sand is an erosional surface, the dip direction of the silty interval within the Hanford sand cannot be determined from the mapped data.

A-1.4.9 241-A TANK FARM AREA

Description of Waste

101-A Tank: Mixed wastes including B Plant and PUREX high-level waste, PUREX organic and carbonate wash waste, double-shell slurry feed, and complexed and noncomplexed waste. Potential flammable gases (hydrogen).

102-A Tank: Mixed wastes including B Plant and PUREX high-level waste, PUREX carbonate wash waste, PUREX sludge supernatant, double-shell slurry feed, evaporator waste, and complexed and noncomplexed waste.

103-A Tank: Mixed wastes including B Plant and PUREX high-level waste, PUREX organic and carbonate wash waste, PUREX sludge supernatant, double-shell slurry feed, evaporator waste, waste fractionization ion exchange waste and complexed and noncomplexed waste.

104-A Tank: Mixed noncomplexed wastes including B Plant and PUREX high-level waste, PUREX organic and carbonate wash waste, and PUREX sludge supernatant. High heat waste.

105-A Tank: Mixed noncomplexed wastes including PUREX high-level waste and PUREX inorganic wash waste. High heat waste.

106-A Tank: Mixed wastes including concentrated phosphate waste, PUREX organic, inorganic and carbonate wash waste, B Plant and PUREX high-level waste, and complexed concentrate.

Service Dates:

101-A Tank: 1/24/56 to 11/21/80.
Partially Isolated 12/15/82.

102-A Tank: 3/22/56 to 11/21/80.
Interim Isolated 12/15/82.
Interim Stabilized

103-A Tank: 5/17/56 to 8/14/80.
Partially Isolated 12/15/82.
Assumed Leaker 1987.
Interim Stabilized 8/88.

104-A Tank: 6/30/58 to 4/75.
Confirmed Leaker 1975.
Interim Stabilized 9/78.
Interim Isolated 12/15/82.
Stabilized (1984).

105-A Tank: 1962 to 11/71.
Confirmed Leaker 1963.
Interim Stabilized 7/79.
Stabilized 1984.
Interim Isolated 10/3/85.

106-A Tank: 1957 to 1980.
Interim Stabilized 8/82.
Interim Isolated 12/25/82.
Stabilized 1984.

<u>Waste Volume:</u>

101-A Tank: 953,000 gal Total Waste Volume.
950,000 gal Salt cake.
3,000 gal Sludge.
(413,000 gal Drainable Interstitial Liquid).

102-A Tank: 41,000 gal Total Waste Volume.
22,000 gal Salt cake.
15,000 gal Sludge.
4,000 gal Supernatant.
(6,000 gal Drainable Interstitial Liquid).

103-A Tank: 370,000 gal Total Waste Volume.
366,000 gal Sludge.
4,000 gal Supernatant.
(17,000 gal Drainable Interstitial Liquid).
5,500 gal Estimated Leaked Volume.

104-A Tank: 28,000 gal Total Waste Volume.
28,000 gal Sludge.
2,500 gal Estimated Leaked Volume.

105-A Tank: 19,000 gal Total Waste Volume.
19,000 gal Sludge.
(4,000 gal Drainable Interstitial Liquid).
3,000 to 15,000 gal Estimated Leaked Volume.

106-A Tank: 125,000 gal Total Waste Volume.
125,000 gal Sludge.
(7,000 gal Drainable Interstitial Liquid).

Evaluation of Scintillation Probe Profiles

The 241-A Tank Farm is located within the 200-PO-3 Operable Unit, northeast of the PUREX Chemical Separations Facility. Each of the 6 single-shell tanks in the 241-A Tank Farm has a capacity of 1,000,000 gal. All of these tanks were removed from service by 1980, and have been initially stabilized. Each tank has a status of interim isolated or partially interim isolated. Tanks 241-A-104 and 241-A-105 have been categorized as confirmed leakers (Welty 1988) (assumed leakers in Hanlon 1991) and tank 241-A-103 as an assumed leaker (Hanlon 1991; Welty 1988). Vapors from these tanks are processed along with those from the 241-AZ Tank Farm in the 241-AX facilities and routed to the 241-A or 241-AX Tank Farm tanks or are disposed of in the 216-A-24 Crib.

There are 7 outlying monitoring wells around the 241-A Tank Farm, 3 of which reach the water table. Tank 241-A-101 is monitored by 11 drywells, and by one well that reaches the water table (E25-1, 10-01-05). Tanks 241-A-102, -103, -104, -105, and -106 are monitored by 7 drywells each. The wells that are used to monitor the subsurface gamma activity in the 241-A Tank Farm are periodically logged by TFSA&S. Only 1 well, E24-65, is not logged by TFSA&S. This well was logged once by PNL in 1987. Details of each monitoring well within the 241-A Tank Farm are given in Table A-1.10.

The wells used in this evaluation were selected based upon their historic activity as reported by Welty (1988). Logs from wells in which activity above 50 ct/sec was reported (Welty 1988) and logs from neighboring wells were used. It appears that elevated near surface activity was not always reported. It is possible that many wells where potential surface contamination was recorded may have been left out by the screening process used, so the extent of the near-surface region of elevated gamma radiation may not be adequately characterized in this evaluation.

Scintillation probe profiles from selected monitoring wells within the 241-A Tank Farm were compiled into five cross sections and correlated with the lithologic cross sections of Price and Fecht (1976) (Figures A1-18, A1-19, and A1-20). The correlation between

features on the scintillation probe profiles and the lithologic sections of Price and Fecht (1976) were good.

The stratigraphy of the 241-A Tank Farm area can be divided into 3 units. The shallowest of these is the poorly sorted backfill composed of native material, which was used to fill the excavation where the tanks were placed (Price and Fecht 1976). The fill extends from the local surface grade to the base of the tanks, at a depth of about 16.8 m (55 ft). The fill material is composed of poorly sorted, slightly silty, pebbly, very coarse to coarse sand (Price and Fecht 1976). Beneath the backfill, a pebbly facies of the Hanford sand is found that reaches depths of 29 to 38.1 m (95 to 125 ft) below the surface. This pebbly facies is composed of interfingering lenses of pebbly material with varying amounts of silt and grain distributions of sand. Occasionally, well sorted lenses of sandy material, with no pebbles, are found (Price and Fecht 1976). Beneath the pebbly facies, a relatively homogenous sandy facies of the Hanford sand is found. This sandy facies grades laterally from slightly silty, coarse to medium sands and coarse to medium sands into slightly pebbly, very coarse to coarse sands and slightly silty coarse to medium sands in the southeastern part of the farm, under tank A-101 (Price and Fecht 1976). On the lithologic sections of Price and Fecht (1976), a "high" trending to the north is evident in the top of the sandy facies beneath tanks 241-A-102 and 241-A-103.

Significant levels of gamma radiation are detected at or near the ground surface, within the backfill and within the pebbly facies of the Hanford sand in several areas of the 241-A Tank Farm. The relationships between the depths and lateral extent of each occurrence of gamma emitters is complex. It appears that the near surface occurrences of elevated gamma radiation merge laterally over much of the area into two or three large areas (Figure A1-21). There may be several different sources of gamma emitters within these areas. At greater depths, there appears to be two areas where elevated gamma radiation is detected in the backfill, and three within the pebbly facies (Figure A1-22). These areas overlap to a certain extent and may merge in some places.

A-1.4.10 241-AX TANK FARM AREA

Description of Waste:

101-AX Tank: Mixed wastes including double-shell slurry feed, PUREX sludge supernatant, fission product waste, and organic wash waste. Potential flammable gases (Hydrogen).

102-AX Tank: Mixed wastes including B-Plant high-level waste, PUREX high-level waste, complexed and noncomplexed waste, complexed concentrate.

9 2 1 2 6 3 1 1 9 0

103-AX Tank: Mixed wastes including PUREX high-level waste and PUREX sludge supernatant (complexant concentrate waste in Hanlon (1991)). Potential flammable gases Hydrogen).

104-AX Tank: Mixed waste including PUREX high-level waste and PUREX sludge supernatant (noncomplexed waste in Hanlon (1991)).

Service Dates:

101-AX Tank: 1965 to 11/12/80.
Partially Isolated 12/15/82.

102-AX Tank: 1966 to 9/8/80.
Interim Isolated 12/15/82.
Interim Stabilized 9/88.
Assumed Leaker 1988.

103-Ax Tank: 1965 to 9/8/80.
Partially Isolated 12/15/82.
Interim Isolated
Interim Stabilized

104-AX Tank: 1966 to 1976 (9/78 in Welty (1988)).
Assumed Leaker 11/77.
Primary Stabilization 9/78.
Interim Stabilized 8/10/81.
Interim Isolated 12/15/82.
Stabilized 1984.

Waste Volume:

101-AX Tank: 748,000 gal Total Waste Volume.
3,000 gal Sludge.
745,000 gal Salt cake.
320,000 gal Drainable Interstitial Liquid.

102-AX Tank: 39,000 gal Total Waste Volume.
7,000 gal Sludge.
29,000 gal Salt cake.
3,000 gal Supernatant.
14,000 gal Drainable Interstitial Liquid.

Estimated Volume of Leaked Waste: 3,000 gal.

103-AX Tank: 112,000 gal Total Waste Volume.
2,000 gal Sludge.
110,000 gal Salt cake.
36,000 gal Drainable Interstitial Liquid.

104-AX Tank: 7,000 gal Total Waste Volume.
7,000 gal Sludge.

Estimated Volume of Leaked Waste: N/A

Evaluation of Scintillation Probe Profiles

The 241-AX Tank Farm is located within the 200-PO-3 Operable Unit, northeast of the PUREX Chemical Separation Facility. Each of the 4 single-shell tanks in the 241-AX Tank Farm has a capacity of 1,000,000 gal. These tanks have been removed from service and the ventilation system isolated from other tank farms. The 241-101-AX Single-Shell Tank is monitored by 8 drywells, the 241-102-AX Single-Shell Tank by 11 drywells, the 241-103-AX Single-Shell Tank by 6 drywells, and the 241-104-AX Single-Shell Tank by 7 drywells. These wells are periodically logged by TFSA&S. Details of the wells monitoring the 241-AX Tank Farm tanks are given in Table A1-11.

Several of the wells monitoring the 241-AX Tank Farm tanks were compiled into four cross sections and correlated with the lithologic cross sections in Price (1976) (Figures A-1.23, 24, and 25). Subtle changes in the logs often correspond to changes in the grain size distribution of the sediments. There is a discrepancy between the location for Well E25-121 (11-04-07) on the as-built drawing (Drawing # H-2-36935, Rev. 4, Welty 1988) and that of Price (1976), so that well was not used in any of the cross sections. The top of casing for each well in the 241-AX Tank Farm was scaled from the cross sections of Price (1976).

The stratigraphy of the 241-AX Tank Farm area can be divided into 3 units. The shallowest of this is the poorly sorted fill which envelops the tanks and consists of slightly pebbly, slightly silty coarse to fine sand (Price, 1976). At the base of the fill and the tanks, a pebbly facies of the Hanford sand is present. This pebbly facies is made up of discontinuous lenses of pebbly material with varying amounts of silt and grain distributions of sand. The top of the pebbly facies is at an elevation of about 190 m (625 ft) and its base dips in a westerly direction from an elevation of about 182 m (600 ft) to about 175 m (575 ft) (Price 1976). A relatively homogeneous sandy facies of the Hanford sand is found. This

sandy facies consists of slightly silty, very coarse to medium sand with occasional lenses of relatively sandy or silty material (Price 1976).

Presently, there are eight areas of potential contamination by anthropogenic radionuclides within the 241-AX Tank Farm (Figure A1-26). In two of these areas, elevated gamma activity can be correlated between three or four adjacent wells. The remaining occurrences of elevated gamma radiation are isolated areas near single wells. In all of these areas, the gamma emitters detected are confined to the fill material. Activity is mainly found at or near the surface and declines to background levels with increasing depth. There is no evidence of elevated gamma radiation within the Hanford sand.

A-1.4.11 241-C Tank Farm

Description of Waste:

101-C Tank: Bismuth phosphate, tributyl phosphate and PUREX coating mixed wastes.

102-C Tank: Bismuth phosphate, tributyl phosphate, PUREX coating, Thoria high-level and PUREX organic wash mixed wastes.

103-C Tank: Tributyl phosphate, Purex coating, organic wash, PUREX high- and low-level, PUREX sludge supernatant, B-Plant waste fractionization, B-Plant high-level, laboratory, decontamination, REDOX ion exchange and high-level, noncomplexed, N Reactor, PNL and evaporator bottom mixed wastes.

104-C Tank: Bismuth phosphate, PUREX coating, organic wash, tributyl phosphate, PUREX high- and low-level, B-Plant high-level, decontamination, REDOX high-level, waste fractionization ion exchange, N Reactor, PNL, evaporator bottoms, Thoria high- and low-level and complexed mixed wastes.

105-C Tank: Tributyl phosphate , PUREX coating and sludge supernatant, bismuth phosphate first-cycle, PUREX high-level, B-Plant waste fractionization, REDOX high-level and supernatant, noncomplexed, metal and cesium feet mixed wastes.

106-C Tank: PUREX coating and high-level, waste fractionization ion exchange, tributyl phosphate and PUREX sludge supernatant mixed wastes.

107-C Tank: Tributyl phosphate, PUREX coating, bismuth phosphate first-cycle, Hot Semiworks, Hanford laboratory operations, decontamination, waste fractionization ion exchange, N Reactor, PNL and evaporator bottom mixed wastes.

108-C Tank: Tributyl phosphate, PUREX coating, bismuth phosphate first-cycle, Hot Semiworks, organic wash, laboratory, decontamination, REDOX high-level, waste fractionization ion exchange, N Reactor and PNL mixed wastes.

109-C Tank: Bismuth phosphate, tributyl phosphate, PUREX coating, Hot Semiworks, evaporator bottom and ion exchange mixed wastes.

110-C Tank: Bismuth phosphate, tributyl phosphate, organic wash, coating, REDOX ion exchange and evaporator bottom mixed wastes.

111-C Tank: Tributyl phosphate, PUREX coating and organic wash, bismuth phosphate first-cycle, Hot Semiworks, evaporator bottom and ion exchange mixed wastes.

112-C Tank: Tributyl phosphate, PUREX coating, Hot Semiworks and ion exchange mixed wastes.

201-C Tank: Bismuth phosphate and strontium Semiworks mixed wastes.

202-C Tank: Bismuth phosphate, strontium Semiworks and ion exchange mixed wastes.

203-C Tank: PUREX high-level mixed waste.

204-C Tank: PUREX high-level mixed waste.

<u>Service Dates:</u>

101-C Tank: 3/46 to 12/69.
Questionable Integrity 1970.
Primary Stabilization 3/78.
Confirmed Leaker 1/80.
Interim Isolated 12/82.
Interim Stabilized 11/83.

102-C Tank: 5/46 to 1976.
Partially Isolated 12/82.

103-C Tank: 8/46 to
Partially Isolated 12/82.

104-C Tank: 10/46 to
Partially Isolated 12/82.
Interim Stabilized
Interim Isolated

105-C Tank: 2/46 to
Partially Isolated

106-C Tank: 6/47 to 1979.
Partially Isolated

107-C Tank: 4/46 to 1976.
Partially Isolated 12/82.

108-C Tank: 9/47 to 1976.
Interim Isolated 12/82.
Interim Stabilized 3/84.

109-C Tank: 4/48 to 1976.
Interim Isolated 12/82.
Interim Stabilized 11/83.

110-C Tank: 5/46 to 1976.
Questionable Integrity 1977.
Primary Stabilization 9/79.
Partially Isolated 12/82.
Assumed Leaker 1984.

111-C Tank: 8/46 to 1968.
Questionable Integrity 1968.
Interim Isolated 12/82.
Interim Stabilized 3/84.

112-C Tank: 11/46 to 1976.
Partially Isolated 12/82.
Interim Stabilized

201-C Tank: 1953 to 1977.
Interim Stabilized 3/82.
Interim Isolated 12/82.
Assumed Leaker

202-C Tank: 1953 to 1977.
Interim Stabilized 8/81.
Interim Isolated 12/82.
Assumed Leaker

203-C Tank: 1953 to 1977.
Interim Stabilized 3/82.
Interim Isolated 12/82.
Confirmed Leaker 8/84.

204-C Tank: 1953 to 1977.
Primary Stabilization 12/78.
Interim Stabilization 9/82.
Interim Isolated 12/82.
Assumed Leaker

Waste Volume:

101-C Tank: 333,000 L (88,000 gal) Total Waste Volume.
333,000 L (88,000 gal) Sludge.
11,000 L (3,000 gal) Drainable Interstitial Liquid.

102-C Tank: 1,616,000 L (427,000 gal) Total Waste Volume.
1,605,000 L (424,000 gal) Sludge.
11,000 L (3,000 gal) Supernatant.
170,000 L (45,000 gal) Drainable Interstitial Liquid.

103-C Tank: 738,000 L (195,000 gal) Total Waste Volume.
235,000 L (62,000 gal) Sludge.
503,000 L (133,000 gal) Supernatant.

104-C Tank: 1,117,000 L (295,000 gal) Total Waste Volume.
1,117,000 L (295,000 gal) Sludge.
42,000 L (11,000 gal) Drainable Interstitial Liquid.

105-C Tank: 568,000 L (150,000 gal) Total Waste Volume.
568,000 L (150,000 gal) Sludge.
42,000 L (11,000 gal) Drainable Interstitial Liquid.

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106-C Tank: 867,000 L (229,000 gal) Total Waste Volume.
746,000 L (197,000 gal) Sludge.
121,000 L (32,000 gal) Supernatant.
61,000 L (16,000 gal) Drainable Interstitial Liquid.

107-C Tank: 1,276,000 L (337,000 gal) Total Waste Volume.
1,276,000 L (337,000 gal) Sludge.
129,000 L (34,000 gal) Drainable Interstitial Liquid.

108-C Tank: 250,000 L (66,000 gal) Total Waste Volume.
250,000 L (66,000 gal) Sludge.

109-C Tank: 250,000 L (66,000 gal) Total Waste Volume.
235,000 L (62,000 gal) Sludge.
15,000 L (4,000 gal) Supernatant.

110-C Tank: 761,000 L (201,000 gal) Total Waste Volume.
742,000 L (196,000 gal) Sludge.
19,000 L (5,000 gal) Supernatant.
61,000 L (16,000 gal) Drainable Interstitial Liquid.

111-C Tank: 216,000 L (57,000 gal) Total Waste Volume.
216,000 L (57,000 gal) Sludge.

112-C Tank: 394,000 L (104,000 gal) Total Waste Volume.
394,000 L (104,000 gal) Sludge.
121,000 L (32,000 gal) Drainable Interstitial Liquid.

201-C Tank: 7,600 L (2,000 gal) Total Waste Volume.
7,600 L (2,000 gal) Sludge.

202-C Tank: 3,800 L (1,000 gal) Total Waste Volume.
3,800 L (1,000 gal) Sludge.

203-C Tank: 19,000 L (5,000 gal) Total Waste Volume.
19,000 L (5,000 gal) Sludge.

204-C Tank: 11,000 L (3,000 gal) Total Waste Volume.
11,000 L (3,000 gal) Sludge.

Evaluation of Scintillation Probe Profiles

The 241-C tank farm is located with in the 200-PO-3 operable unit, north of the PUREX Chemical Separation Facility. Twelve of the sixteen single shell tanks in the 241-C tank farm have a capacity of 533,000 gal., and the remaining four tanks have a capacity of 55,000 gal. These tanks have all been removed from service and have been partially or interim isolated. Tanks C-101, C-110 and C-112 are monitored by 4 drywells, tanks C-103 and C-111 by 5 drywells, tanks C-104 and C-107 by 7 drywells, tank C-105 by 9 drywells, tank C-106 by 6 dry wells and tank C-108 by 3 dry wells. No drywells are constructed to monitor tanks C-102, C-201, C-202, C-203 and C-204. However, the 11 drywells on the perimeter of the 241-C tank farm or wells which monitor neighboring tanks provide a degree of monitoring capability for these tanks. These wells are logged on a periodic basis by TFSA&S. Details of the wells monitoring the C-farm tanks and the scintillation probe profiles used in this evaluation are given in Table A1-12.

Scintillation probe profiles from several of the drywells in the C-farm were compiled into 5 cross sections and correlated with the lithologic cross sections of Price & Fecht (1976c) (Figures A1-27, A1-28, A1-29, A1-30 and A1-31). Although the response of the gamma logs to changes in lithology is often subtle, the correlation between the lithology and the gamma logs can be considered good due to the detail of the available lithologic information and the uniform response between the different vintages of logs used.

The stratigraphy of the C-farm area can be divided into three units. The shallowest of these is the poorly sorted fill which envelops the tanks and consists of gravelly, very coarse to medium sand and occasional silt (Price & Fecht, 1976). The base of the fill, and the tanks, is at an elevation of about 610 feet. Beneath the backfilled excavation for the tank farm, a pebbly facies of the Hanford sand is present. This pebbly facies consists of discontinuous lenses of pebbly material with varying grain size distributions. In the southern portion of the C-farm, there is a lens of slightly silty coarse sand which does not contain pebbles between deeper pebbly material and the backfill. The base of the pebbly facies sediments dip toward the south from an elevation of about 600 feet to about 560 feet across the tank farm. Beneath the pebbly facies of the Hanford sand, a relatively homogeneous sandy facies is found. This sandy facies is generally composed slightly silty, coarse to very coarse sand. Over much of the area, there is discontinuous lens, up to 30 feet thick, of slightly silty coarse to medium sands at the top of the sandy facies sediments. Also, at greater depths within the sandy facies, a lens of slightly pebbly material is present in the northern part of the tank farm (Price & Fecht, 1976c).

Elevated gamma radiation is found within several regions in the fill, the pebbly facies and the sandy facies. There are three areas where elevated activity is detected at or near the surface (Figure A1-32). The sources of this near surface activity can be attributed to known

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surface contamination or to radionuclides contained within piping at or near the surface. There is clear evidence of downward migration of gamma emitters in all three of these areas. There are eight areas where elevated radiation is found within the backfill and the pebbly facies (Figure A1-33). Of these, two can be attributed to leaking tanks, five are related to near surface releases and one is of unknown origin (adjacent to tank C-109). The is evidence of downward migration of gamma emitters in seven of the eight occurrences of elevated activity within the fill and the pebbly facies. There are two occurrences of elevated radiation within the sandy facies. The levels of activity of these occurrences is very low and may not be statistically significant on some of the profiles where it is identified (Figures A1-29, A1-30 and A1-31). The source of one of these occurrences can be attributed to a leaking tank, the source of the other is unknown. There is no evidence of downward migration of radionuclides for either of these occurrences of elevated gamma radiation in the sandy facies.

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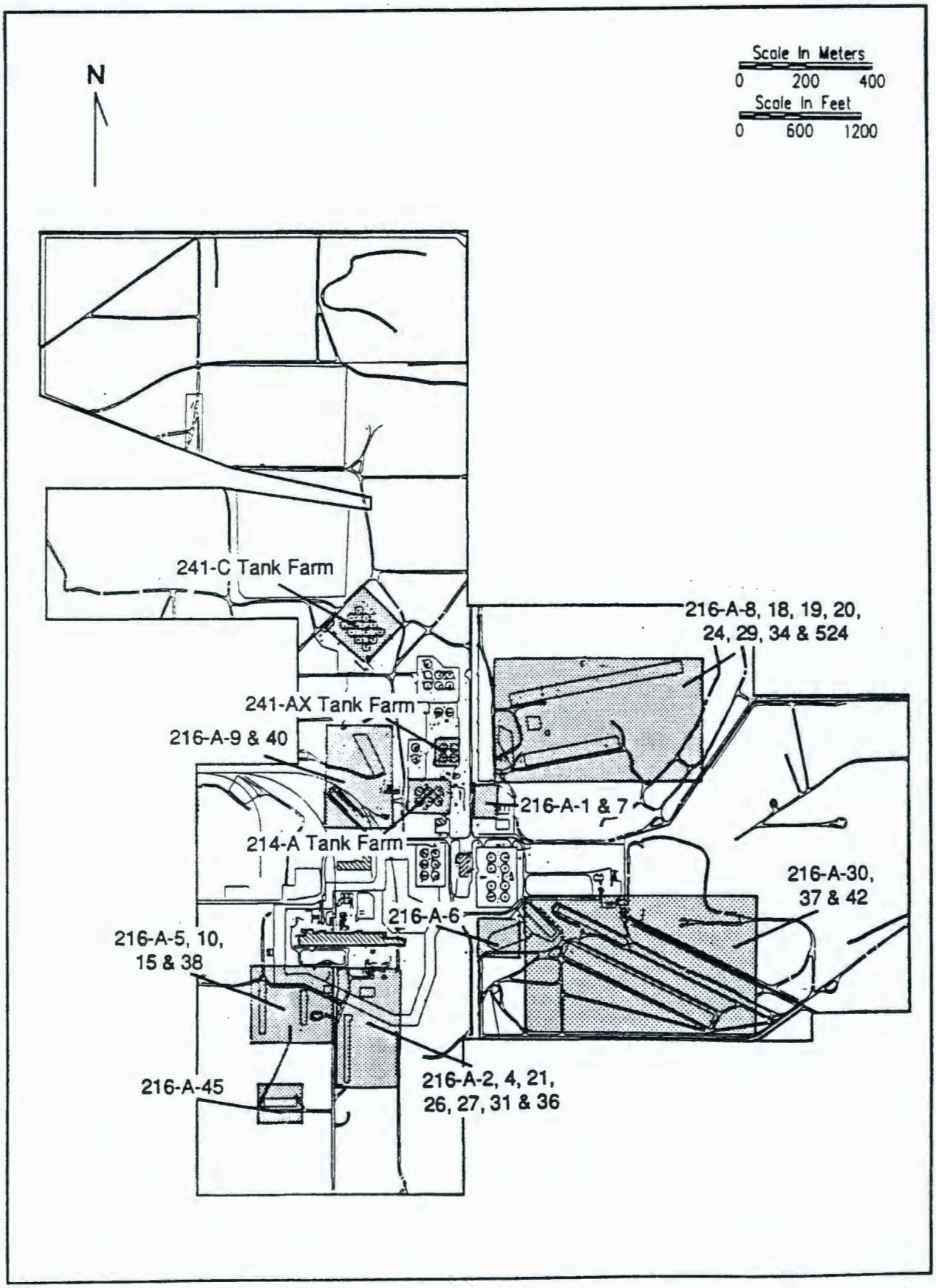

Figure A1-1. PUREX Plant Aggregate Area: Waste Management Unit Areas Evaluated.

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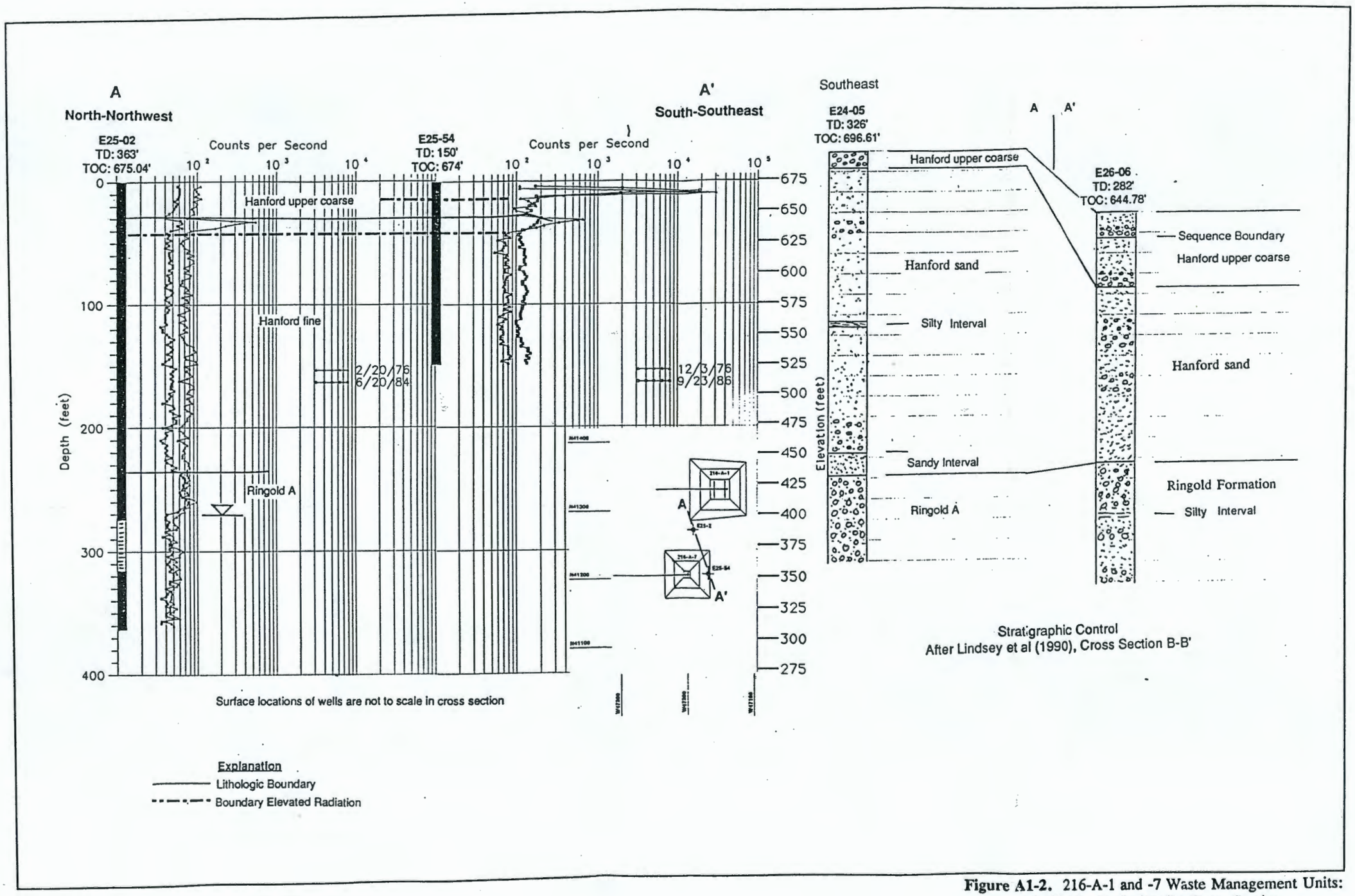

Figure A1-2. 216-A-1 and -7 Waste Management Units: Scintillation Probe Profile Cross Section.

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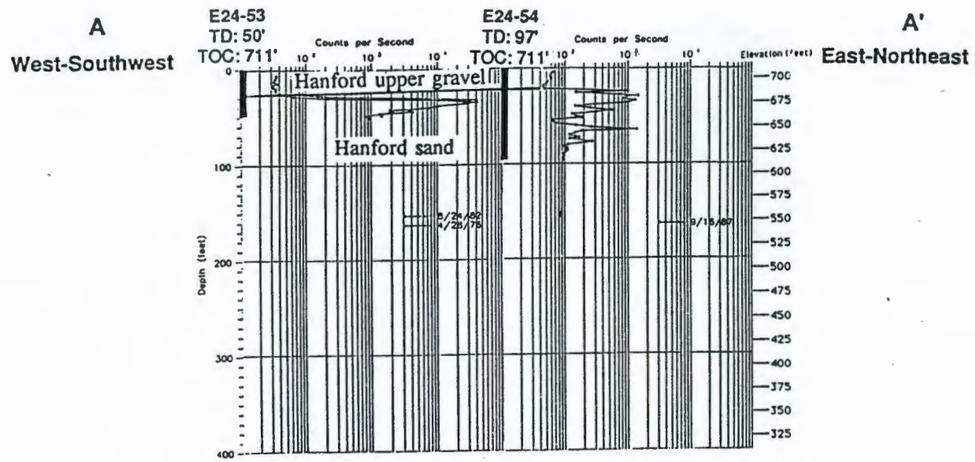

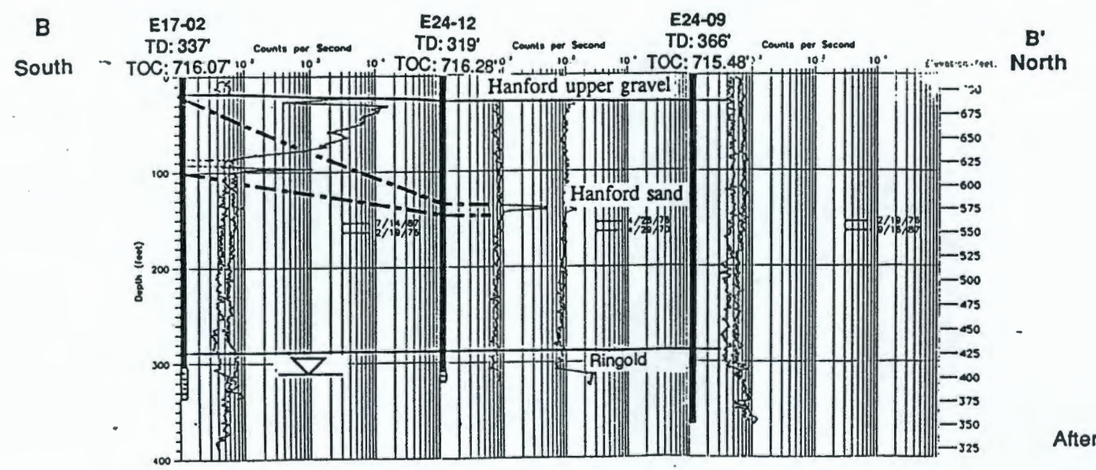

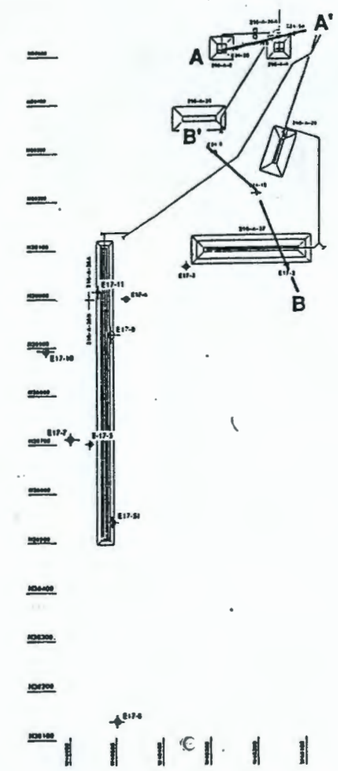

Stratigraphic Control
After Lindsey et al (1990), Cross Section I-I'

Explanation

——— Lithologic Boundary

- - - - Boundary Elevated Radiation

Figure A1-3. 216-2, -4, -21, -26, -27, -31, and -36 Waste Management Units: Scintillation Probe Profile Cross Sections A-A' and B-B'.

9 2 1 2 6 3 1 2 0 3

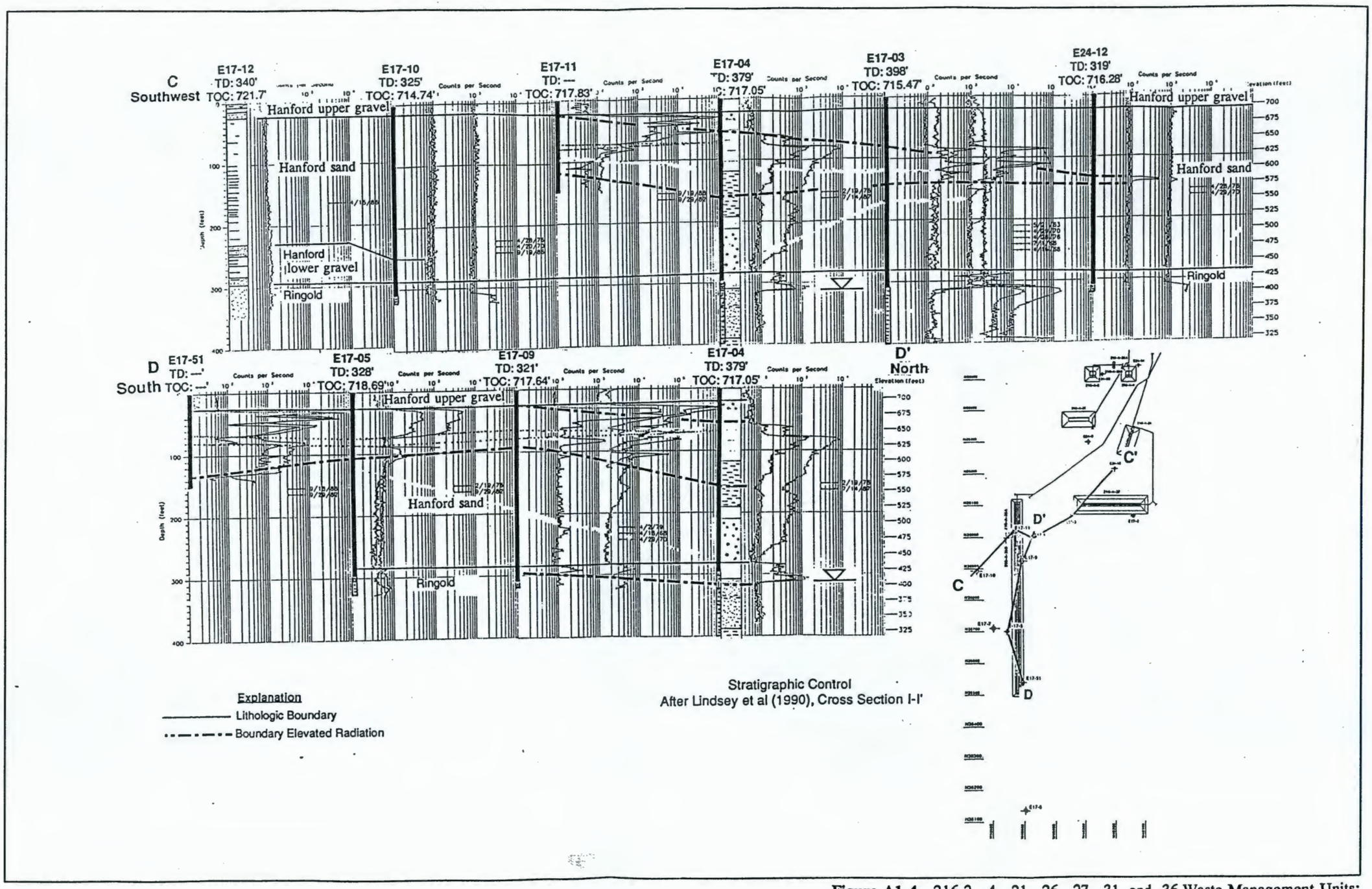

Figure A1-4. 216-2, -4, -21, -26, -27, -31, and -36 Waste Management Units: Scintillation Probe Profile Cross Sections C-C' and D-D'.

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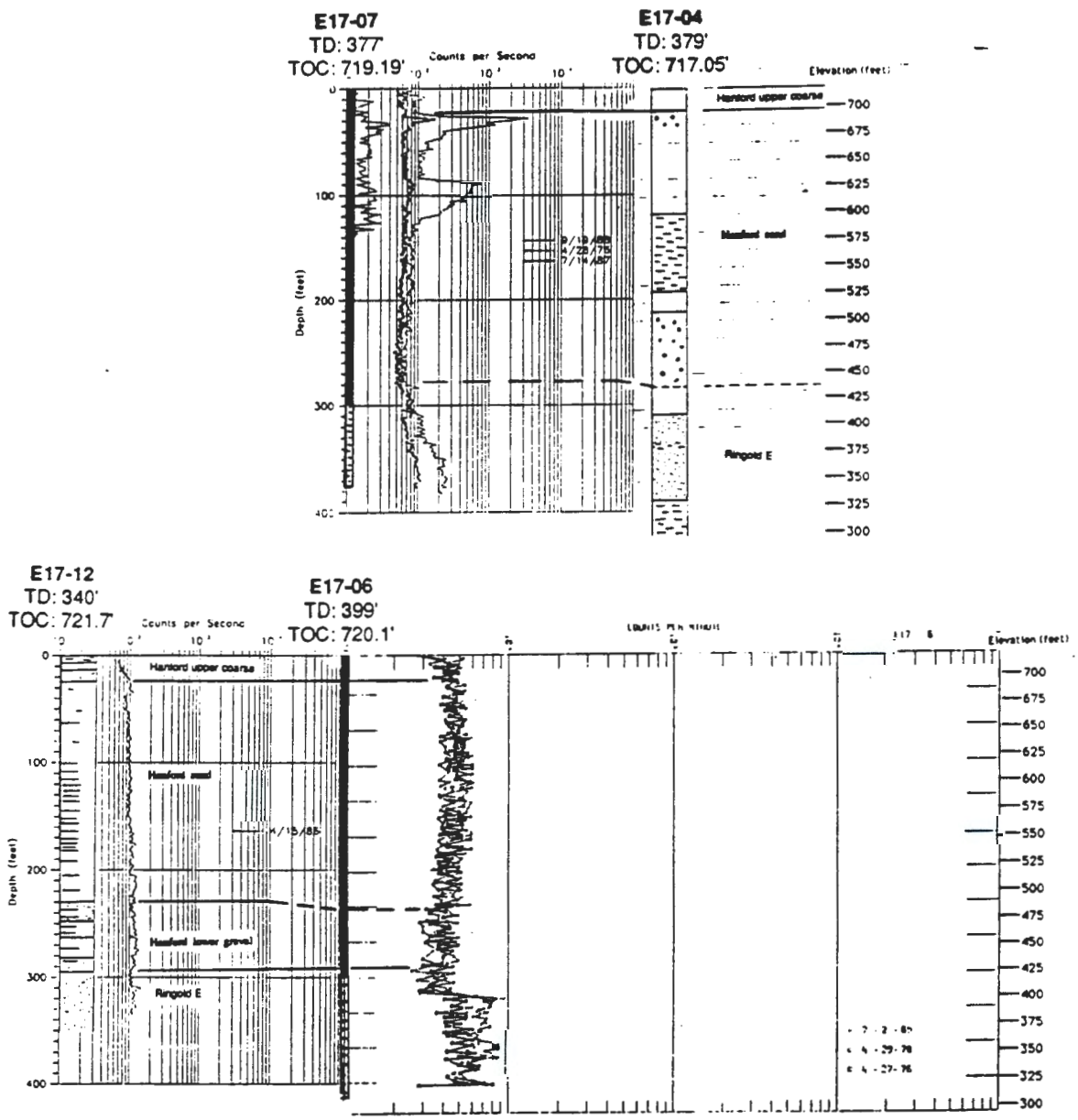

Figure A1-5. 216-2, -4, -21, -26, -27, -31, and -36 Waste Management Units: Additional Scintillation Probe Profiles.

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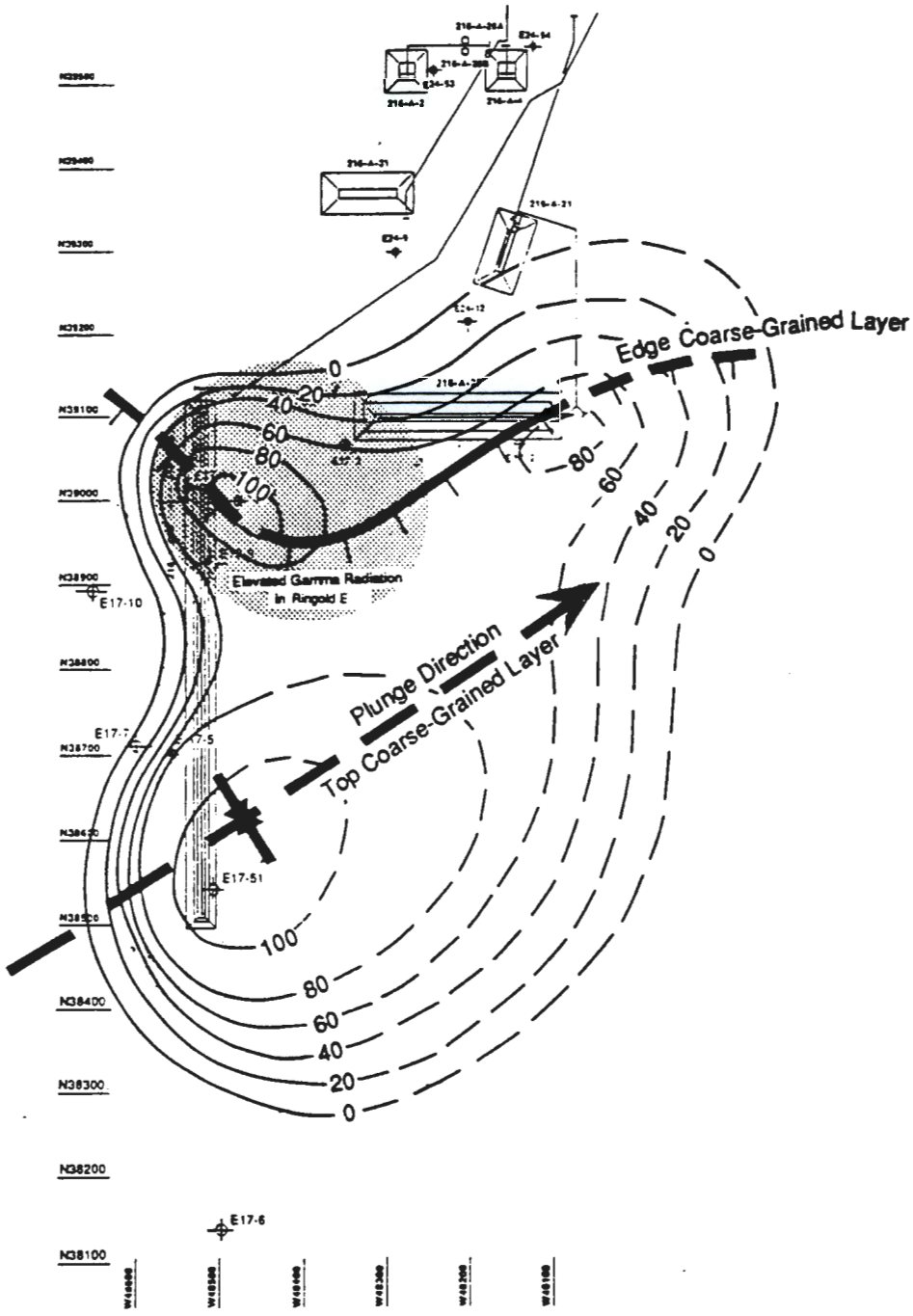

Contour Interval: 20 feet
Dashed Where Inferred

Figure A1-6. 216-2, -4, -21, -26, -27, -31, and -36 Waste Management Units: Hanford Sand Elevated Gamma Radiation Isopach Map.

9 2 1 2 6 3 1 2 0 6

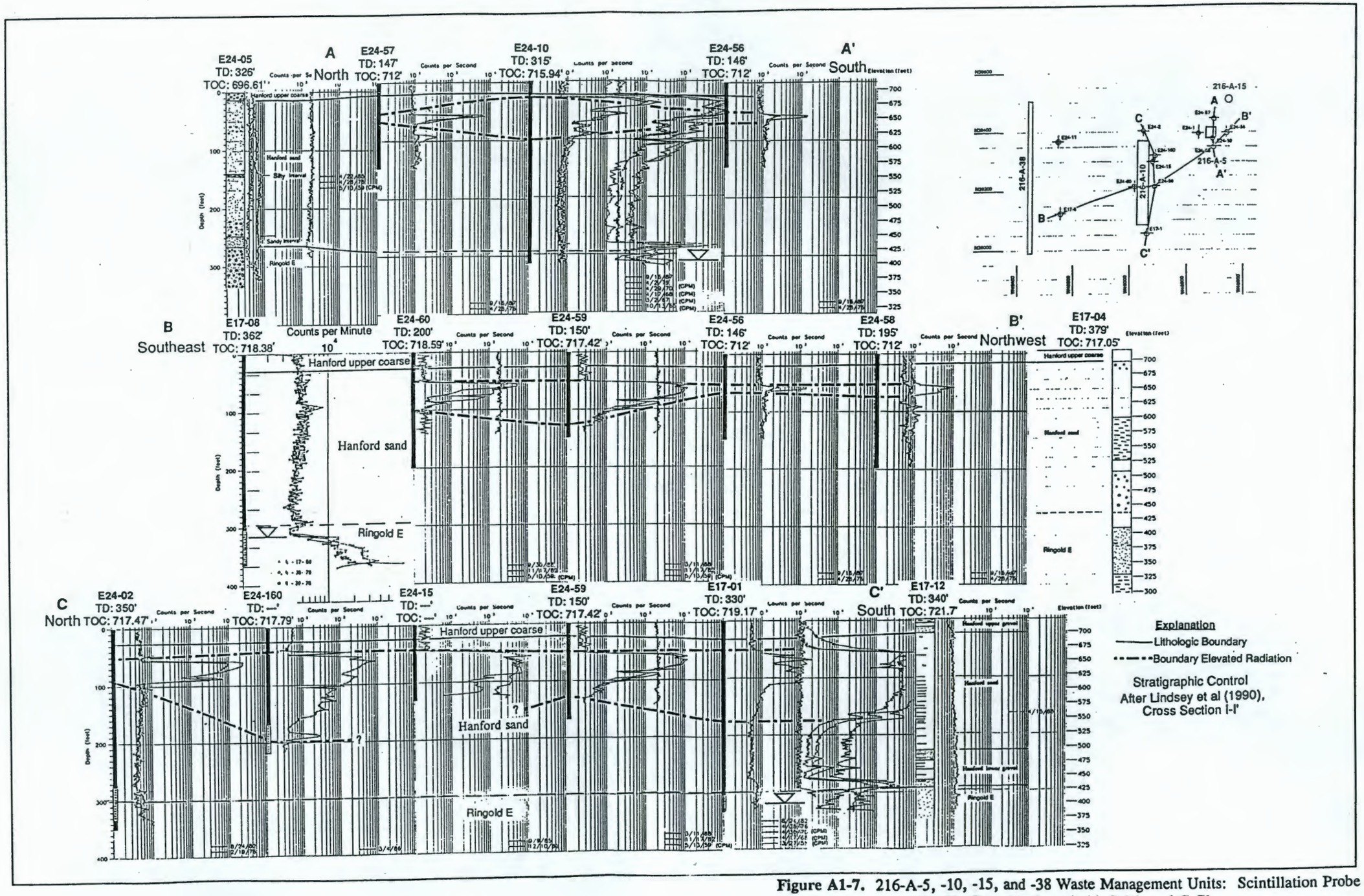

Figure A1-7. 216-A-5, -10, -15, and -38 Waste Management Units: Scintillation Probe Profile Cross Sections A-A', B-B', and C-C'.

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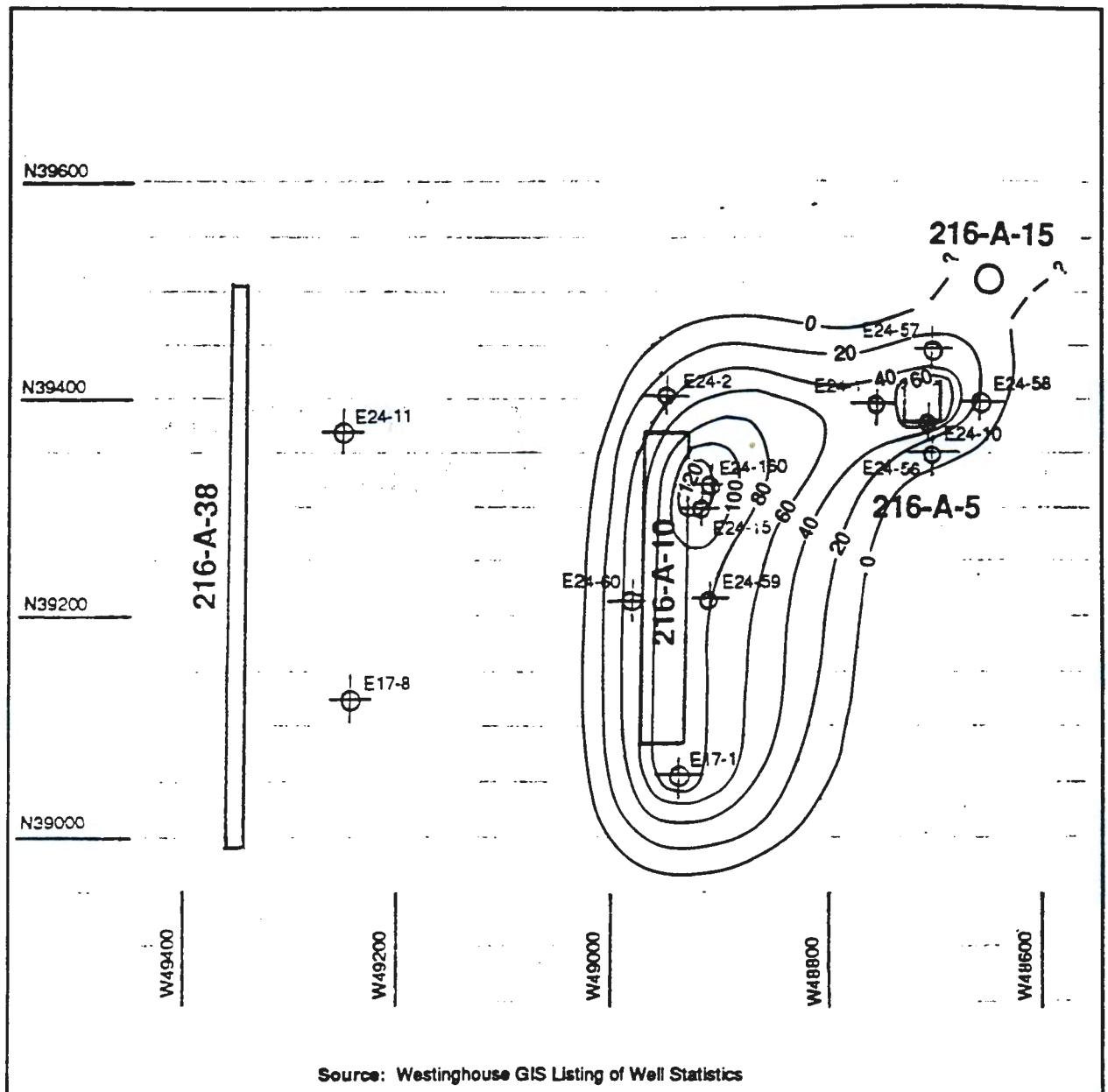

Source: Westinghouse GIS Listing of Well Statistics

Figure A1-8. 216-A-5, -10, -15, and -38 Waste Management Units: Elevated Gamma Radiation Isopach Map.

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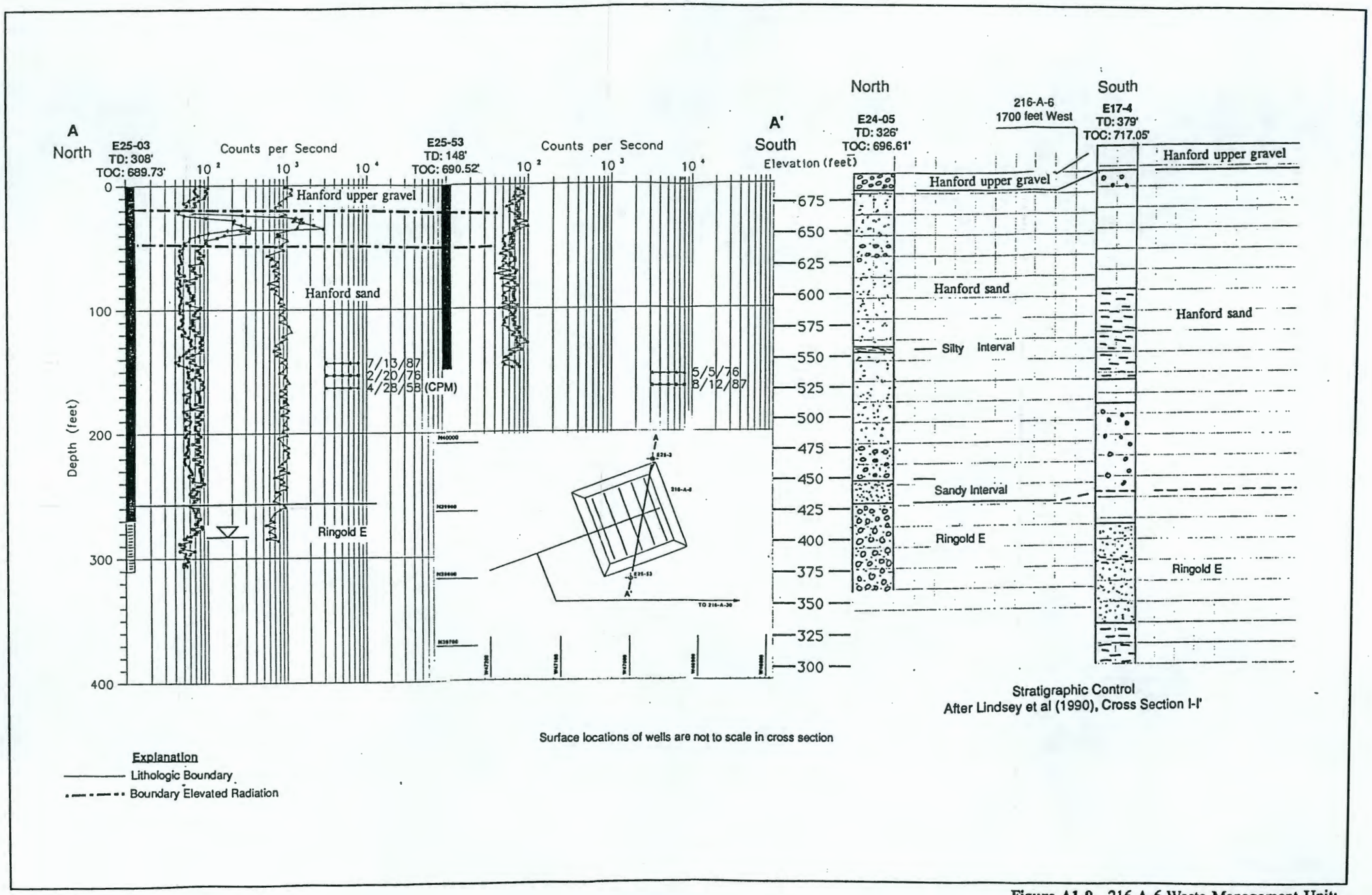

Figure A1-9. 216-A-6 Waste Management Unit: Scintillation Probe Profile Cross Section A-A'.

9 2 1 2 6 3 1 2 0 9

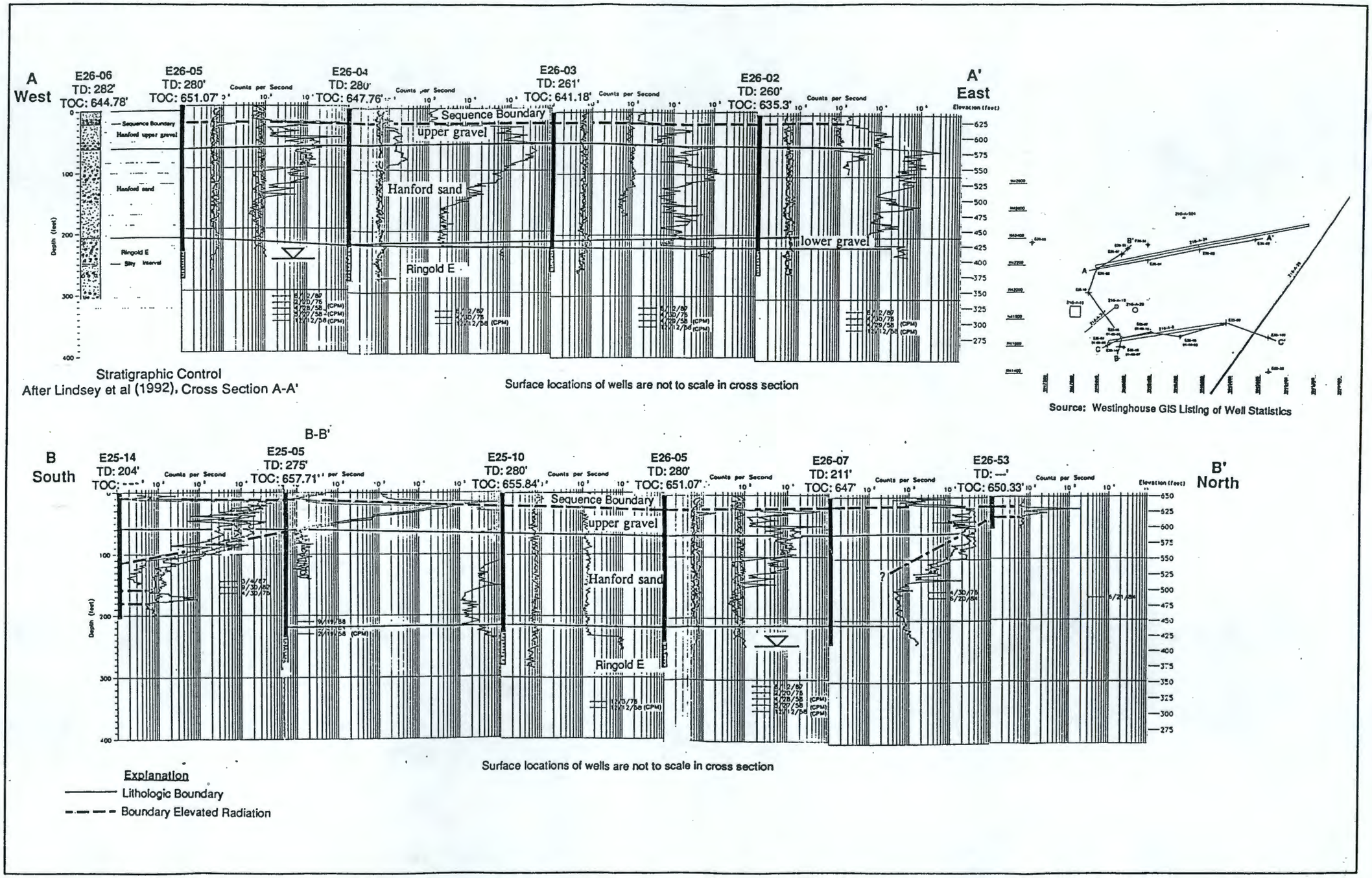

Figure A1-10. 216-A-8, -18, -19, -20, -24, -29, -34, and -524 Waste Management Units: Scintillation Probe Profile Cross Sections A-A' and B-B'.

9 2 1 2 6 3 1 2 1 0

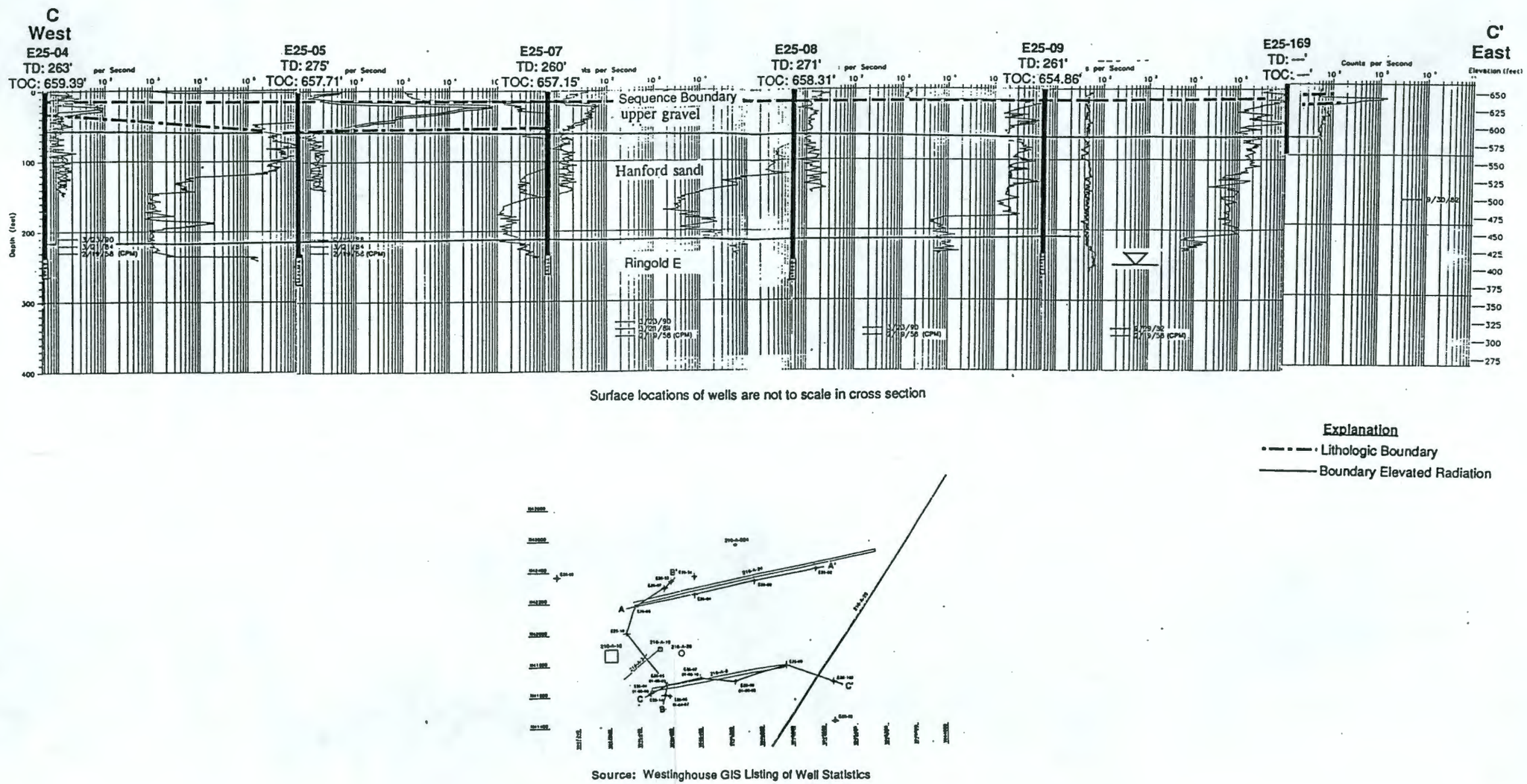

Figure A1-11. 216-A-8, -18, -19, -20, -24, -29, -34, and -524 Waste Management Units: Scintillation Probe Profile Cross Section C-C'.

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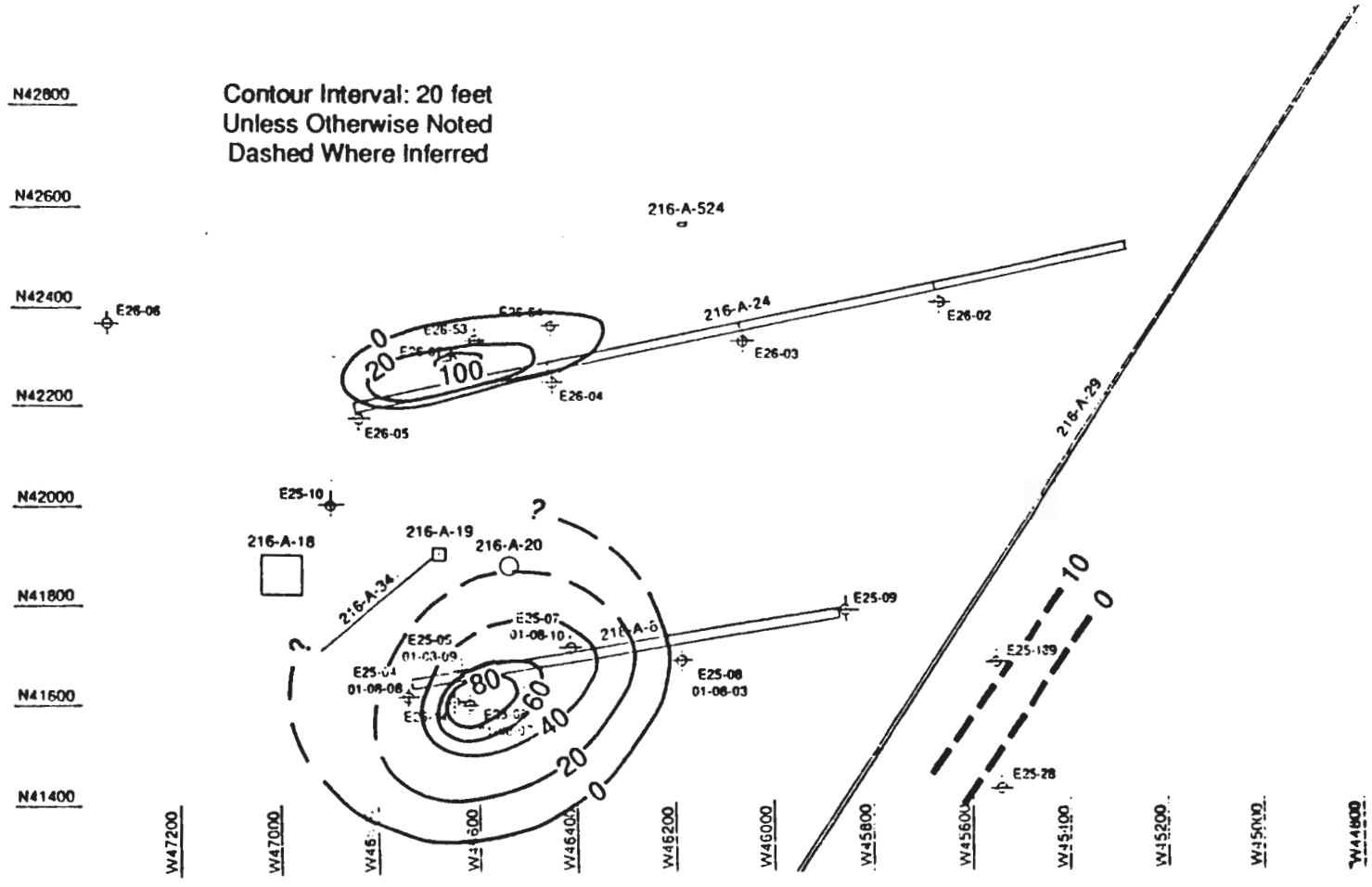
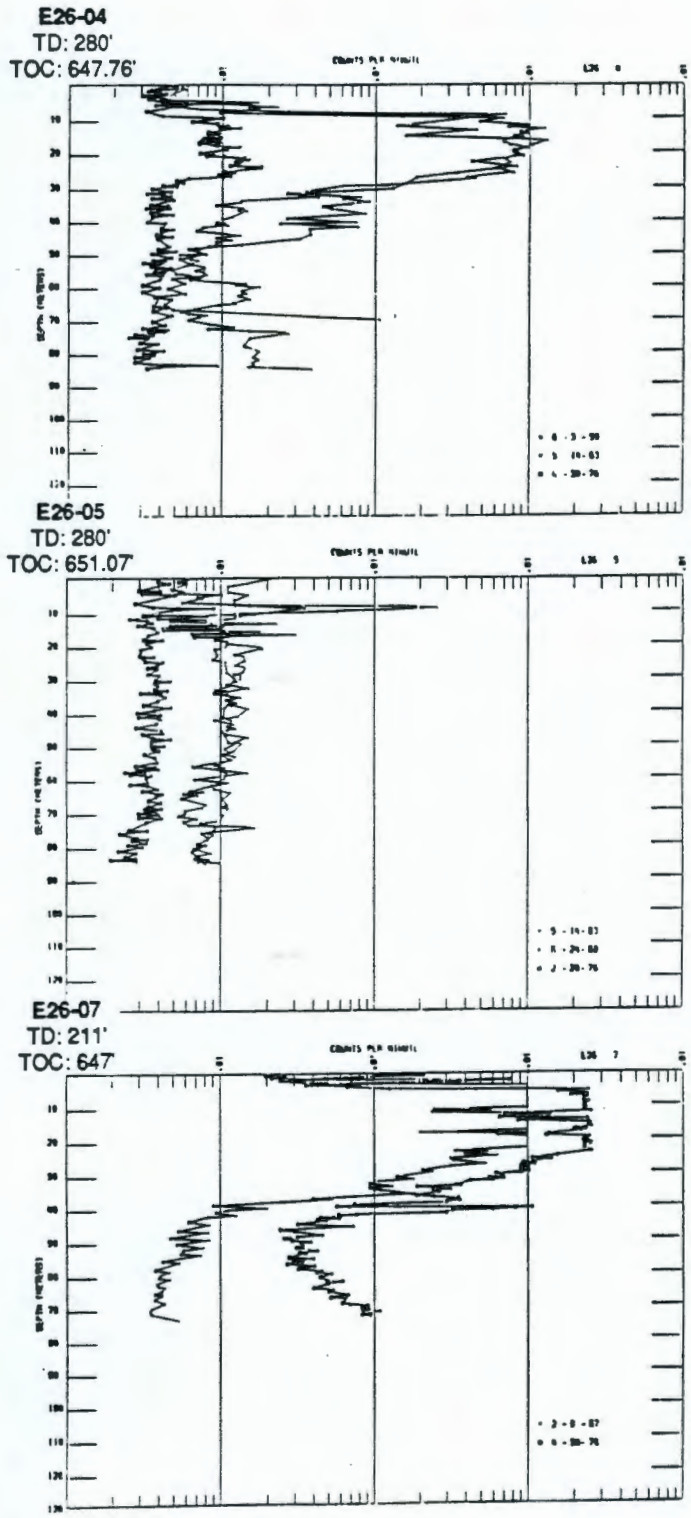


Source: Westinghouse GIS Listing of Well Statistics

Figure A1-12. 216-A-8, -18, -19, -20, -24, -29, -34, and -524 Waste Management Units: Elevated Gamma Radiation Isopach Map.

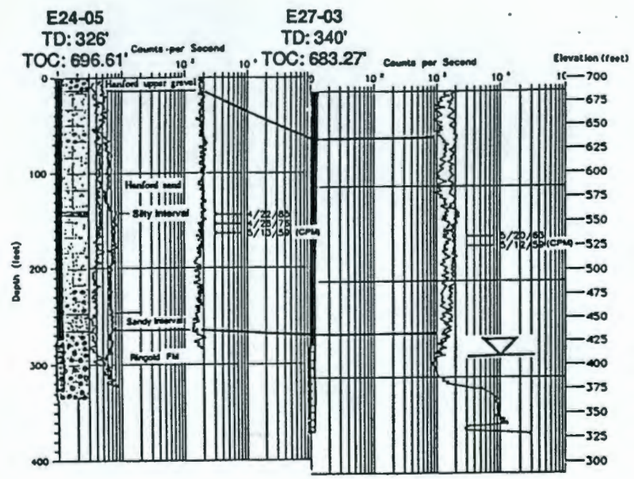


Both wells E26-4 and 5 show a decline in gamma radiation levels to background on the scintillation probe profiles collected between 1968 and 1976.

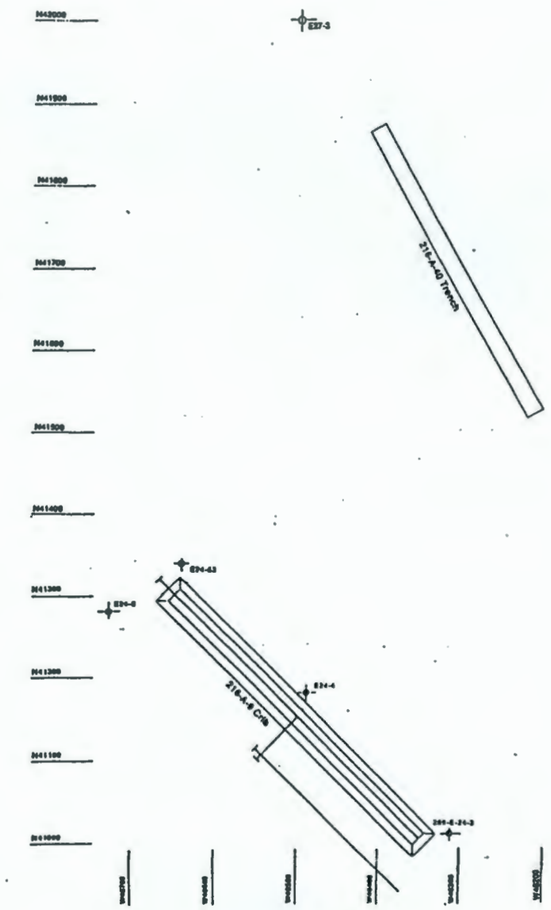
In well E26-7 there is an increase in the levels of gamma radiation from 1967 to 1976, after the waste disposal activities in the A-24 crib ceased. This is evidence of downward migration of radionuclides, possibly in the well bore. The water table is found at a depth of about 230 to 240 feet (70 to 73 meters)

Figure A1-13. 216-A-24 Waste Management Unit: Change in Gamma Radiation Levels, 1968-1976.

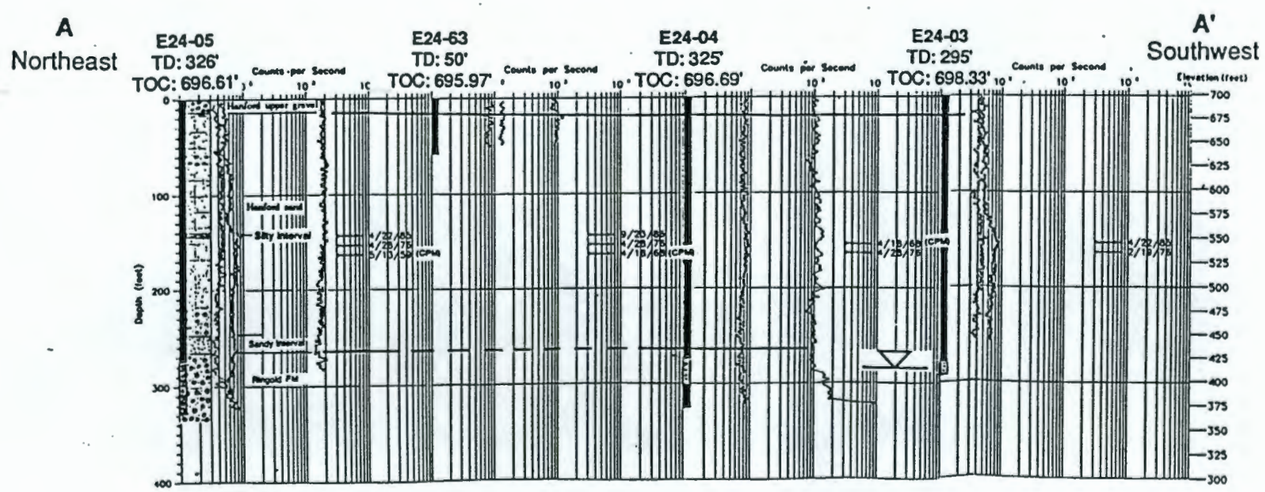
9 2 1 2 6 3 1 2 1 3



Surface locations of wells are not to scale in cross section



Stratigraphic Control
After Lindsey et al. (1992), Cross Sections
B-B' and I-I'



Surface locations of wells are not to scale in cross section

Explanation
Lithologic Boundary
Boundary Elevated Radiation

Figure A1-14. 216-A-9 and -40 Waste Management Units: Scintillation Probe Profile Cross Section A-A'.

9 2 1 2 6 3 1 2 1 4

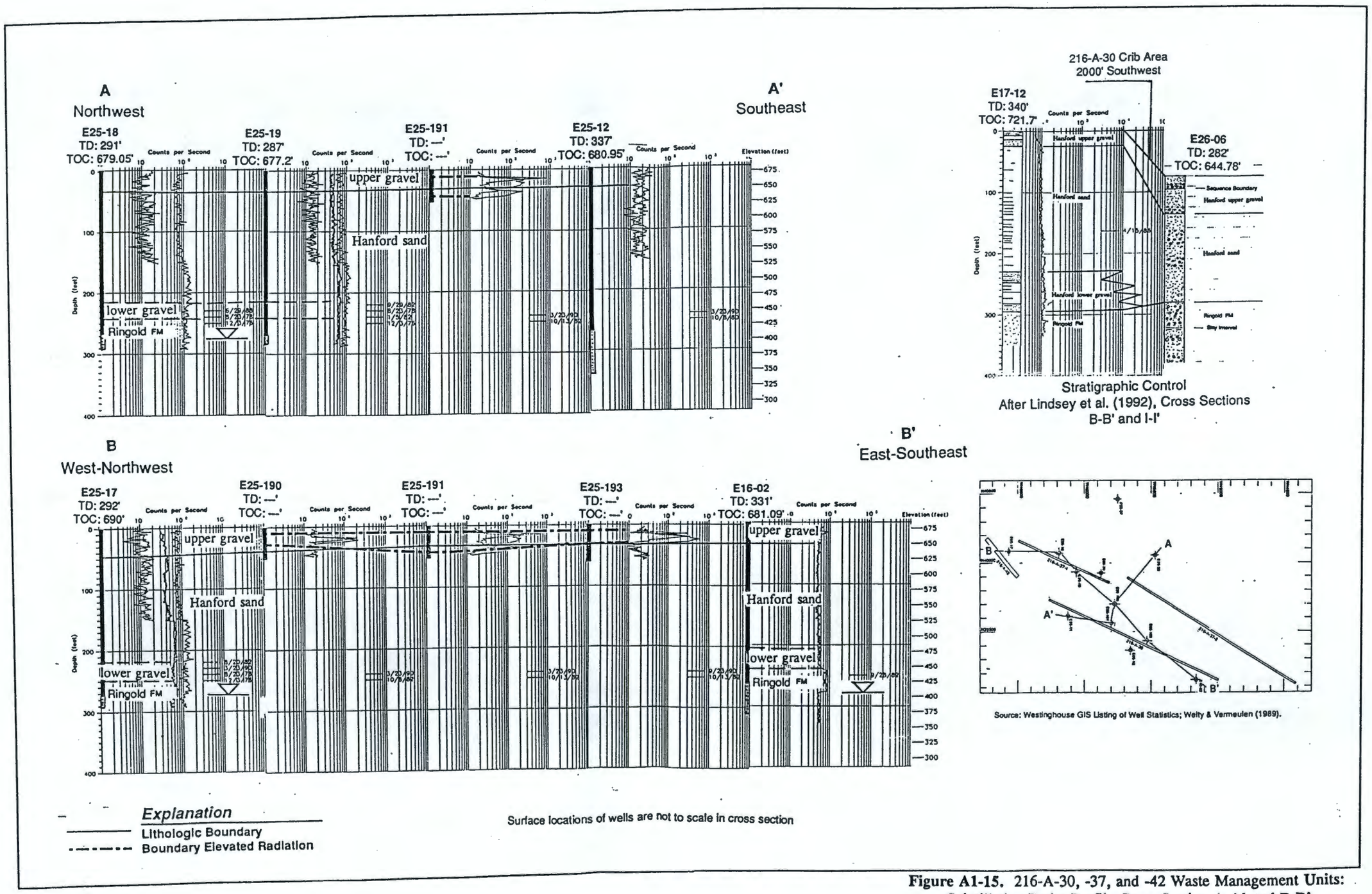
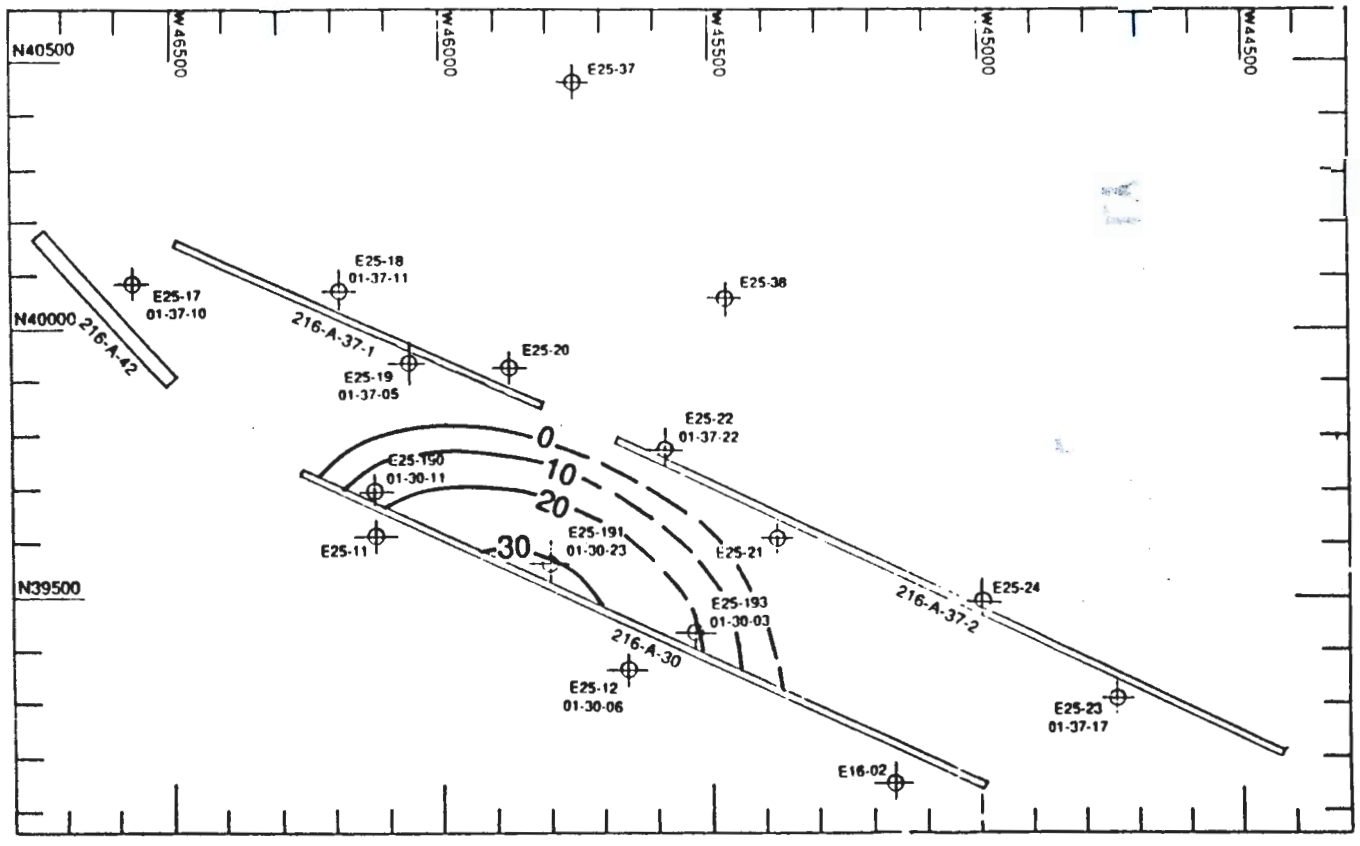


Figure A1-15. 216-A-30, -37, and -42 Waste Management Units: Scintillation Probe Profile Cross Section A-A' and B-B'.

9 2 1 2 6 3 1 2 1 5



Source: Westinghouse GIS Listing of Well Statistics; Welty & Vermeulen (1989).

Figure A1-16. 216-A-30, -37, and -42 Waste Management Units: Elevated Gamma Radiation Isopach Map.

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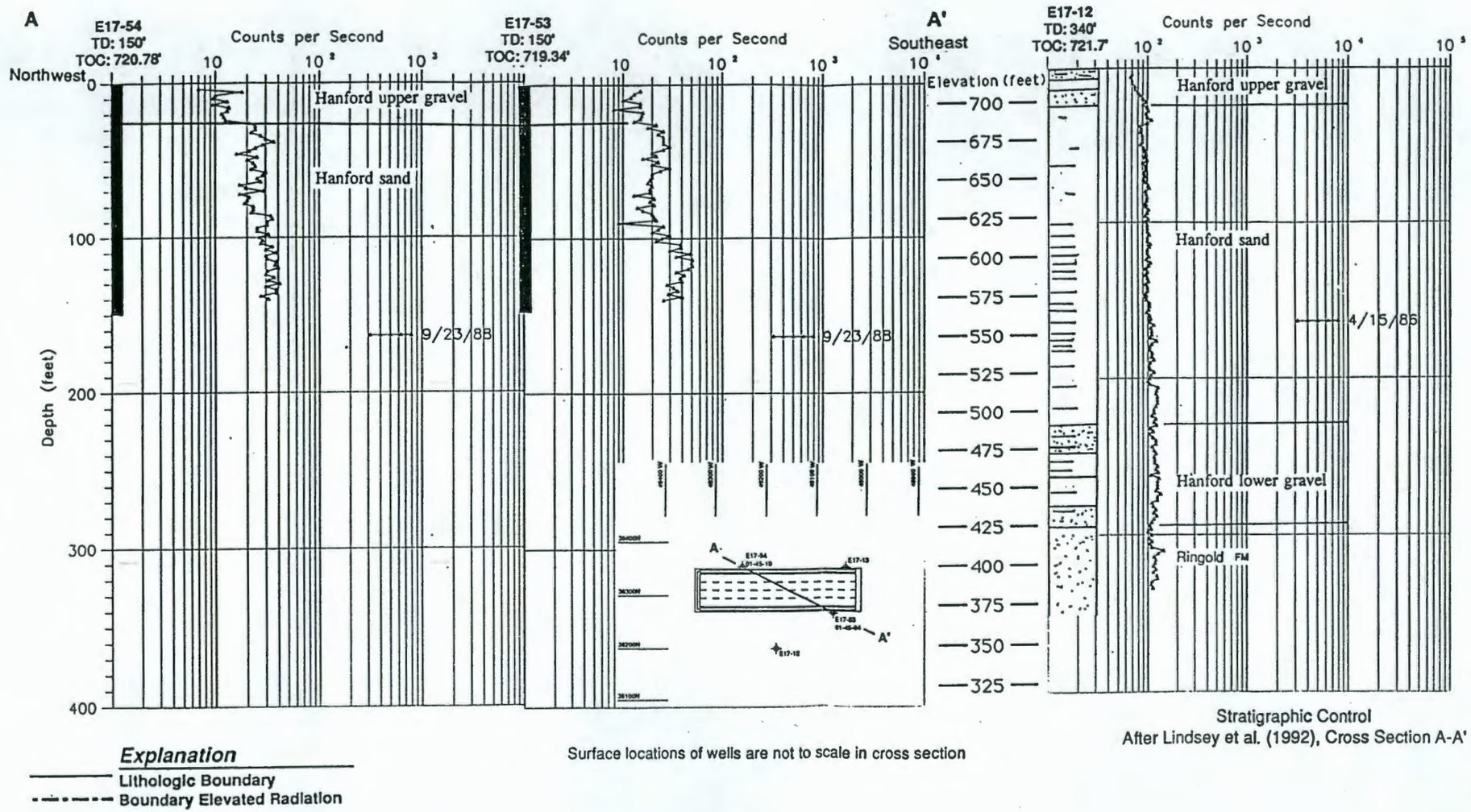

Figure A1-17. 216-A-45 Waste Management Unit: Scintillation Probe Profile Cross Section.

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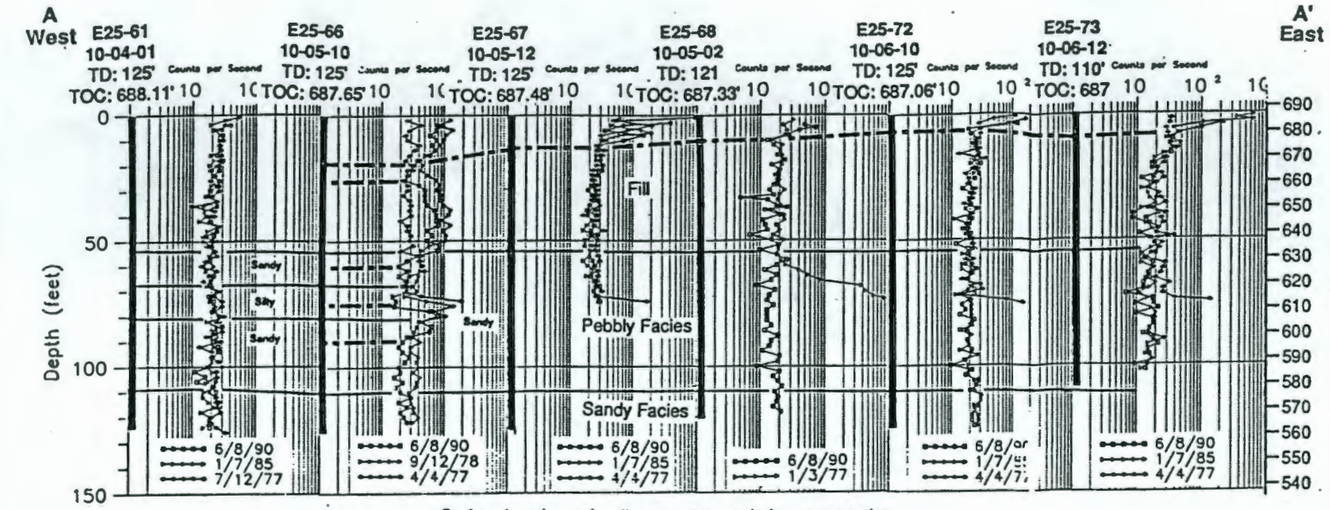
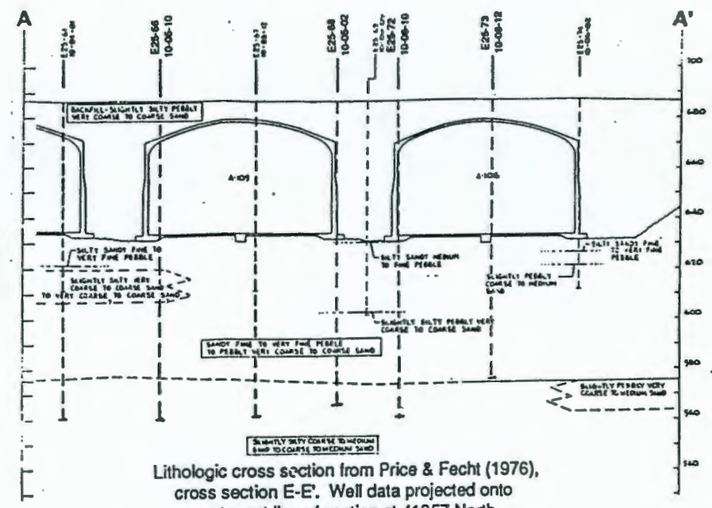
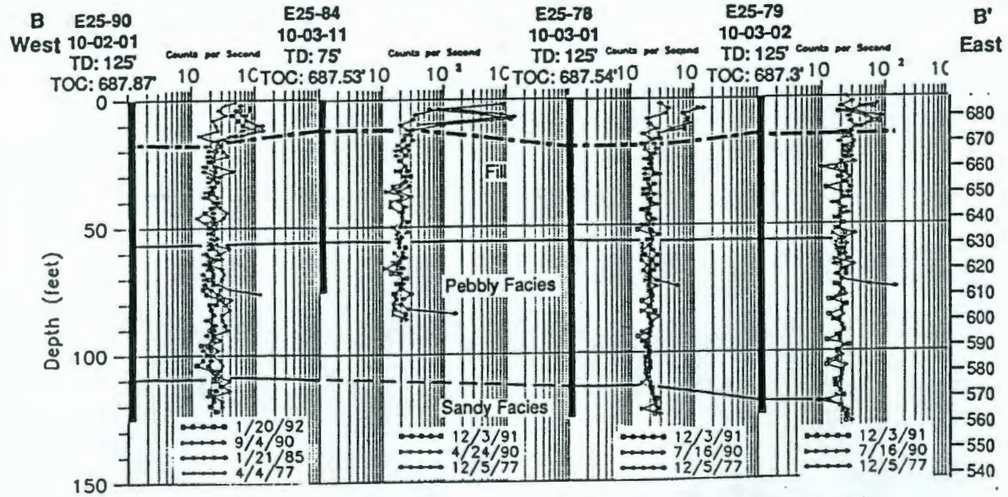


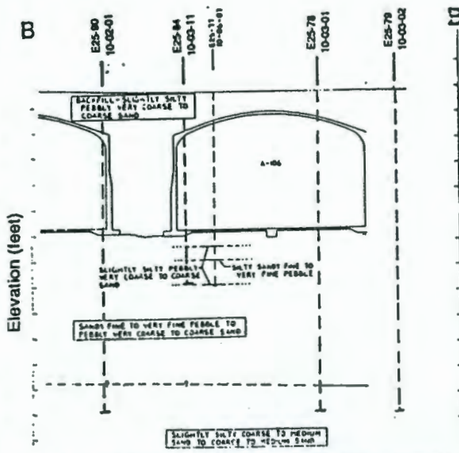
Surface locations of wells are not to scale in cross section



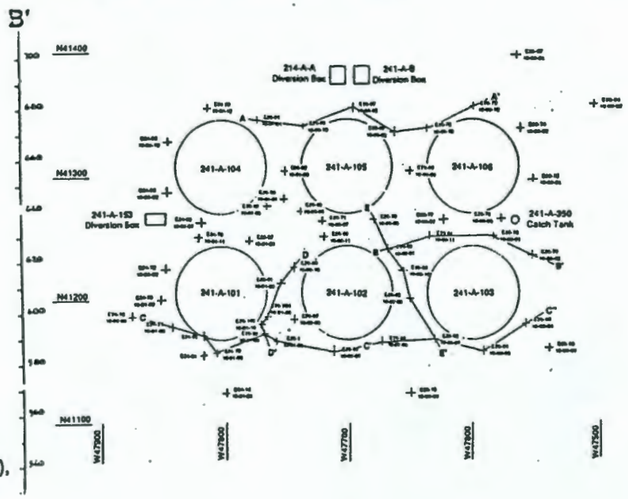
Lithologic cross section from Price & Fecht (1976), cross section E-E'. Well data projected onto east-west line of section at 41357 North.



Surface locations of wells are not to scale in cross section



Lithologic cross section from Price & Fecht (1976), cross section F-F'. Well data projected onto east-west line of section at 41255 North.



Explanation

Lithologic Boundary

Boundary Elevated Radiation

Figure A1-18. 241-A Tank Farm: Scintillation Probe Profile Cross Sections A-A' and B-B'.

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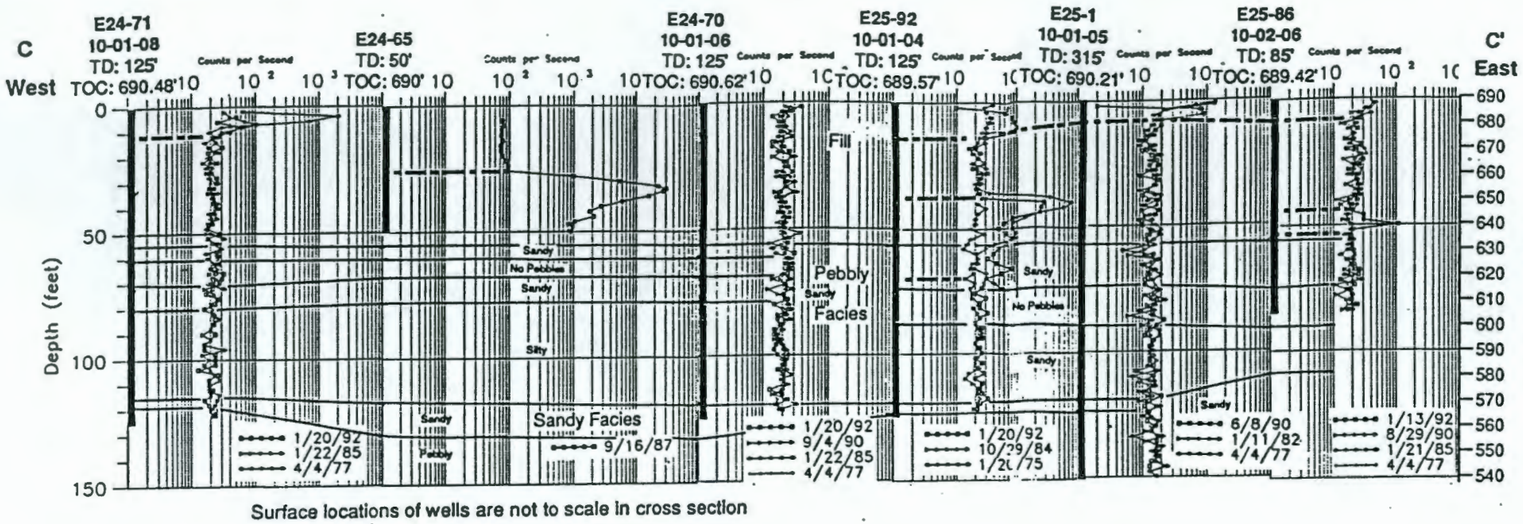
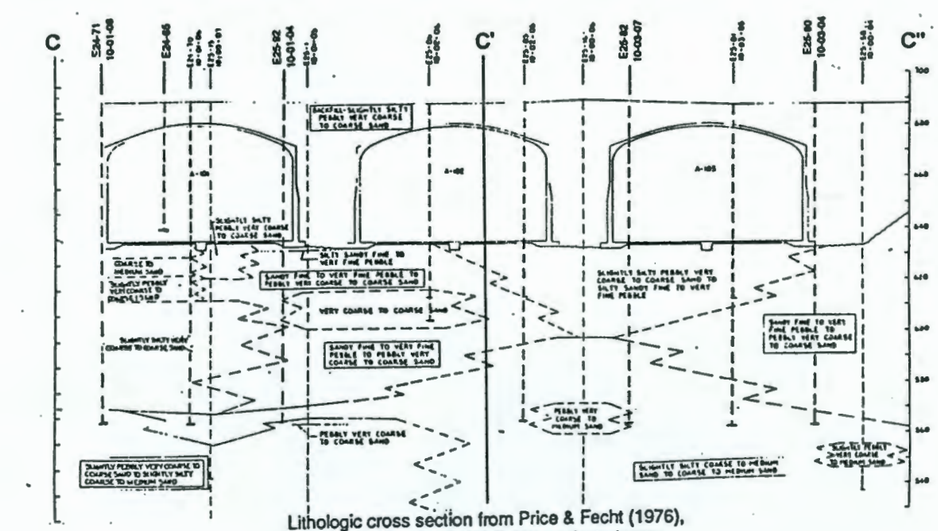
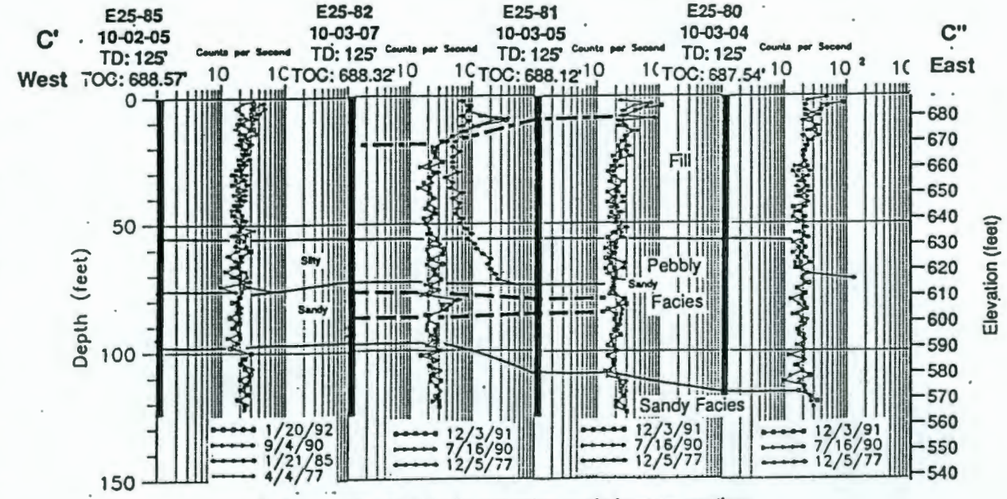


Surface locations of wells are not to scale in cross section



Lithologic cross section from Price & Fecht (1976), cross section G-G'. Well data projected onto east-west line of section at 41153 North.



Surface locations of wells are not to scale in cross section

Explanation

Lithologic Boundary

Boundary Elevated Radiation

Figure A1-19. 241-A Tank Farm: Scintillation Probe Profile Cross Section C-C' and C-C''.

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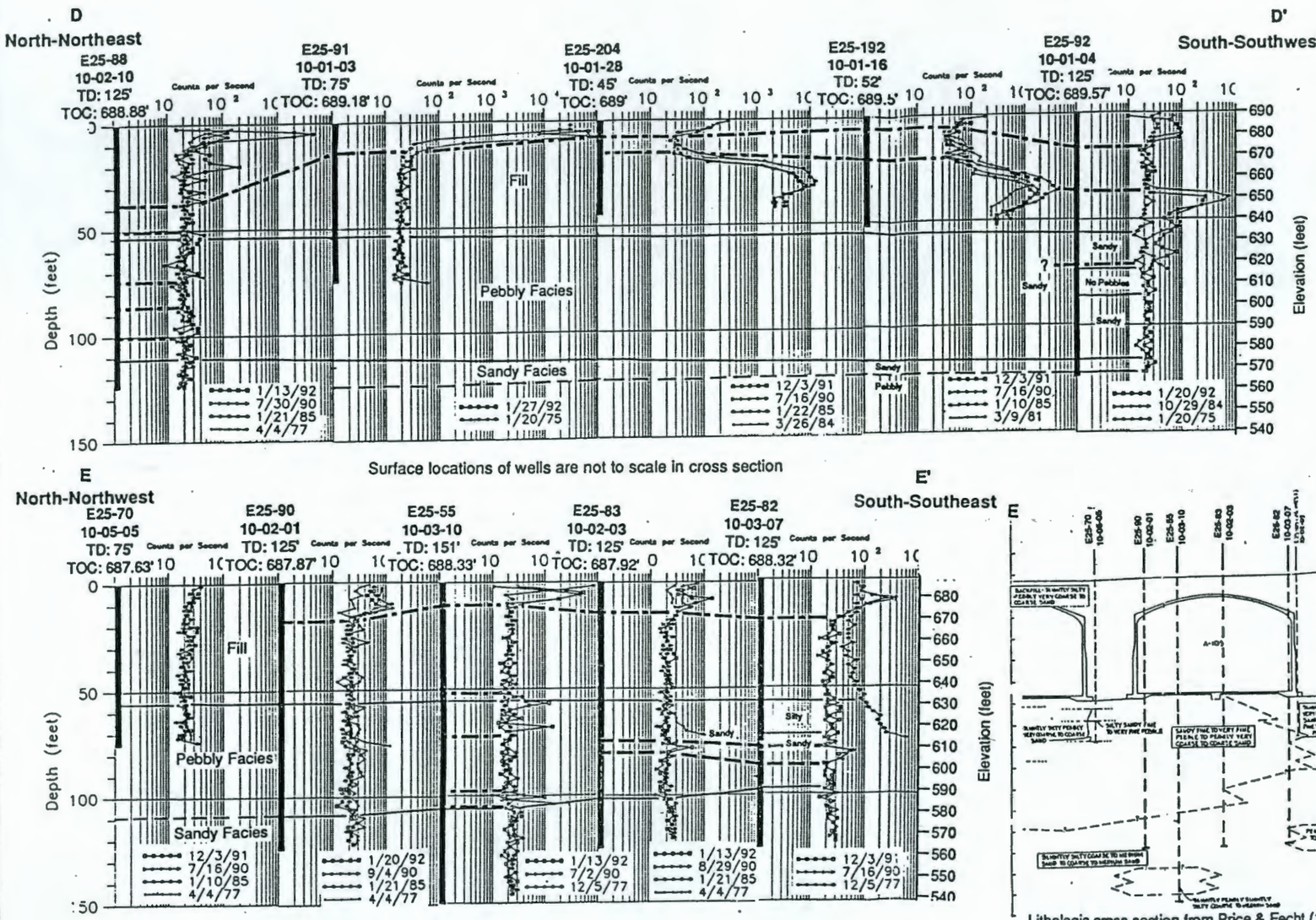
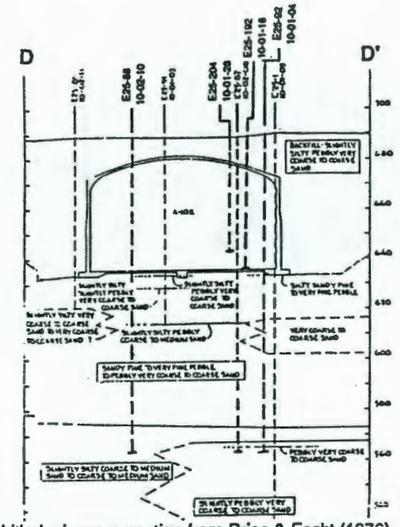
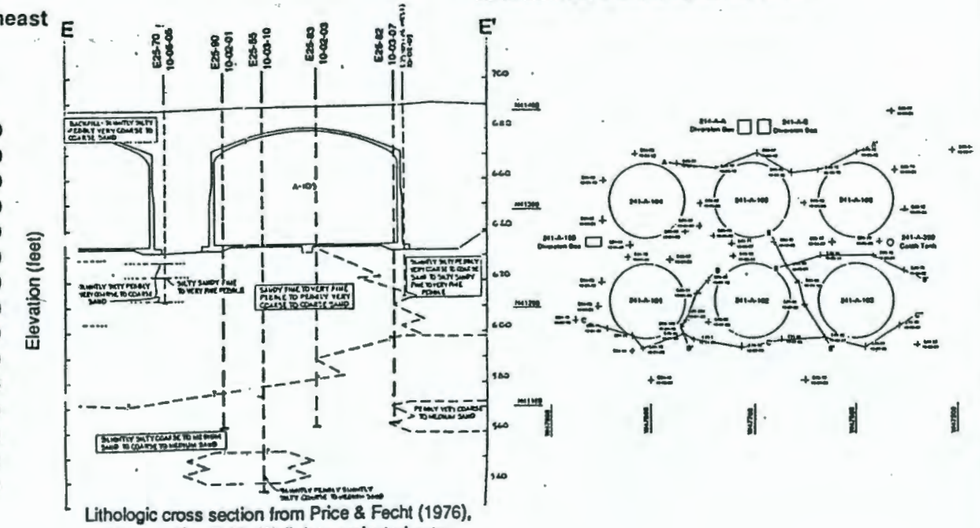




Lithologic cross section from Price & Fecht (1976), cross section C-C'. Well data projected onto north-south line of section at 47753 West.



Lithologic cross section from Price & Fecht (1976), cross section B-B'. Well data projected onto north-south line of section at 47650 West.

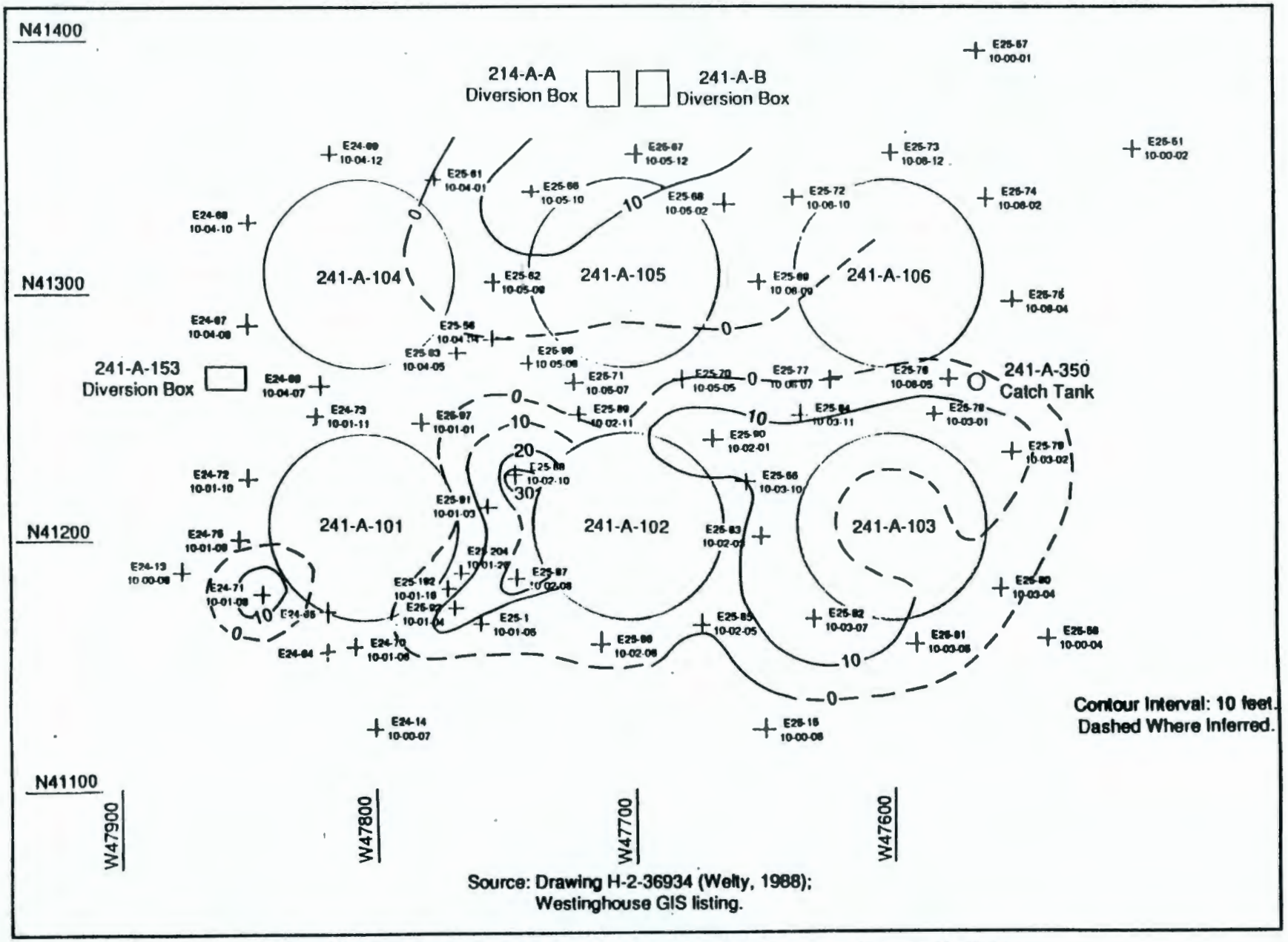
Explanation

Lithologic Boundary

Boundary Elevated Radiation

Figure A1-20. 241-A Tank Farm: Scintillation Probe Profile Cross Sections D-D' and E-E'.

9 2 1 2 6 3 1 2 2 0



Source: Drawing H-2-36934 (Welty, 1988); Westinghouse GIS listing.

Figure A1-21. 241-A Tank Farm: Near Surface Elevated Gamma Radiation Isopach Map.

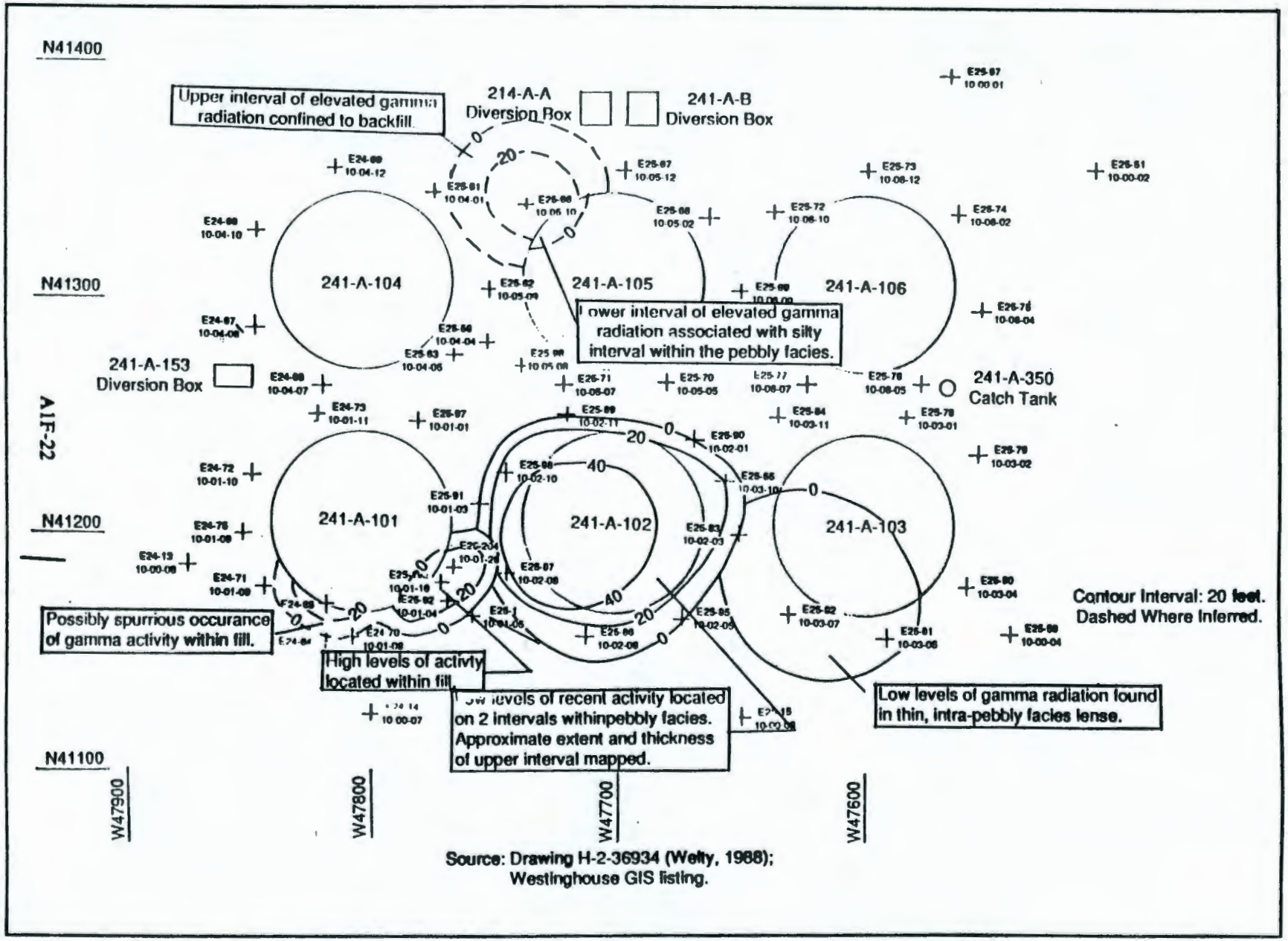
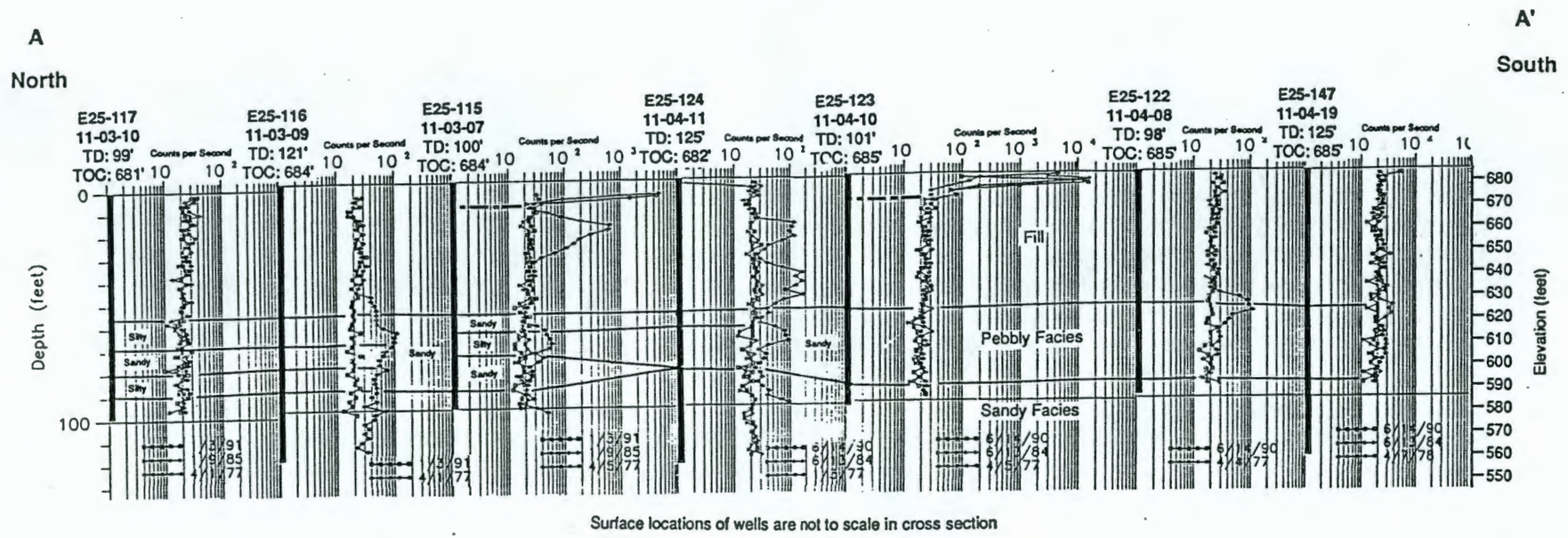
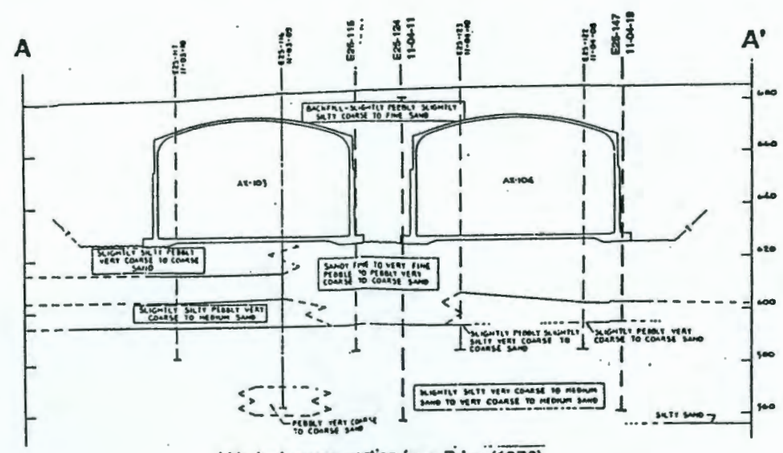
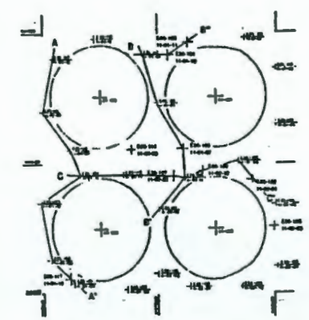


Figure A1-22. 241-A Tank Farm: Intra-Backfill Elevated Gamma Radiation Isopach Map.





Lithologic cross section from Price (1976), cross section F-F'. Well data projected onto north-south line of section at 47610 west.



Explanation
Lithologic Boundary
Boundary Elevated Radiation

Figure A1-23. 241-AX Tank Farm: Scintillation Probe Profile Cross Section A-A'.

9 2 1 2 6 3 1 2 2 3

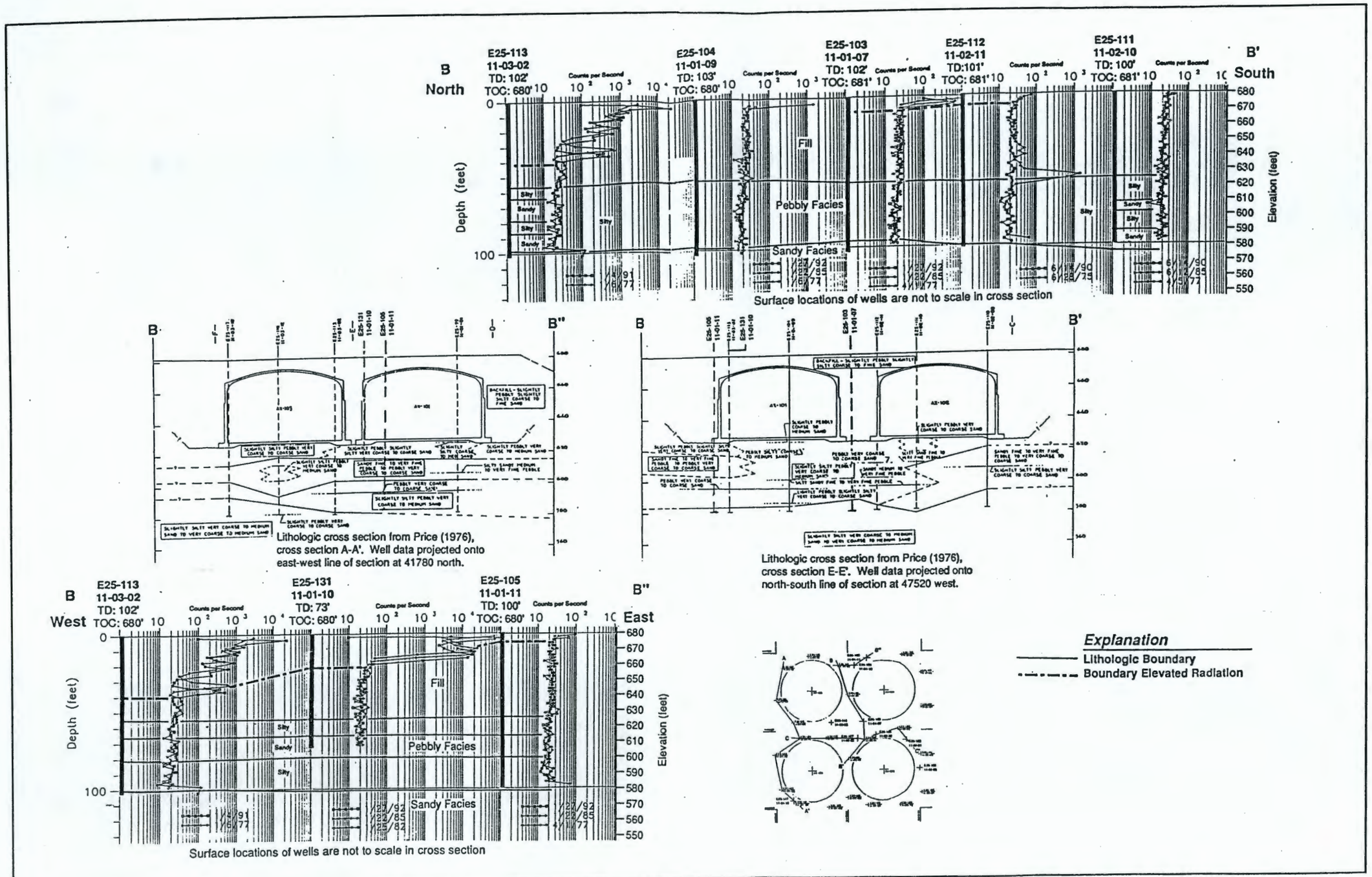
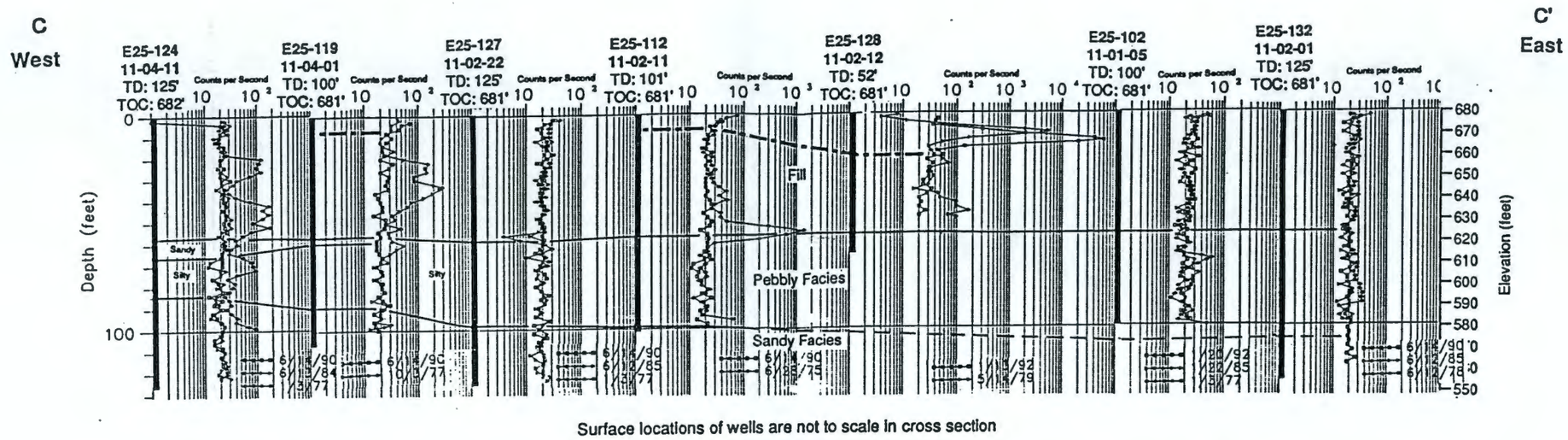
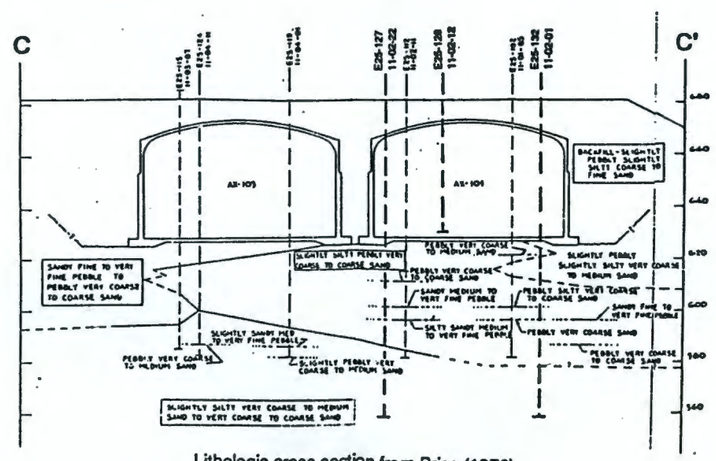


Figure A1-24. 241-AX Tank Farm: Scintillation Probe Profile Cross Sections B-B' and B-B''.

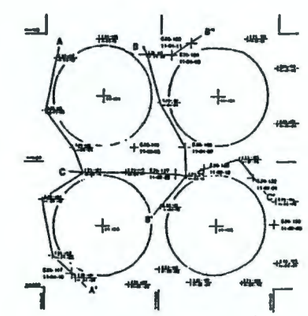
9 2 1 2 6 3 1 2 2 4



Surface locations of wells are not to scale in cross section



Lithologic cross section from Price (1976), cross section B-B'. Well data projected onto east-west line of section at 41680 north.



Explanation

Lithologic Boundary

Boundary Elevated Radiation

Figure A1-25. 241-AX Tank Farm: Scintillation Probe Profile Cross Section C-C'.

9 2 1 2 2 6 3 1

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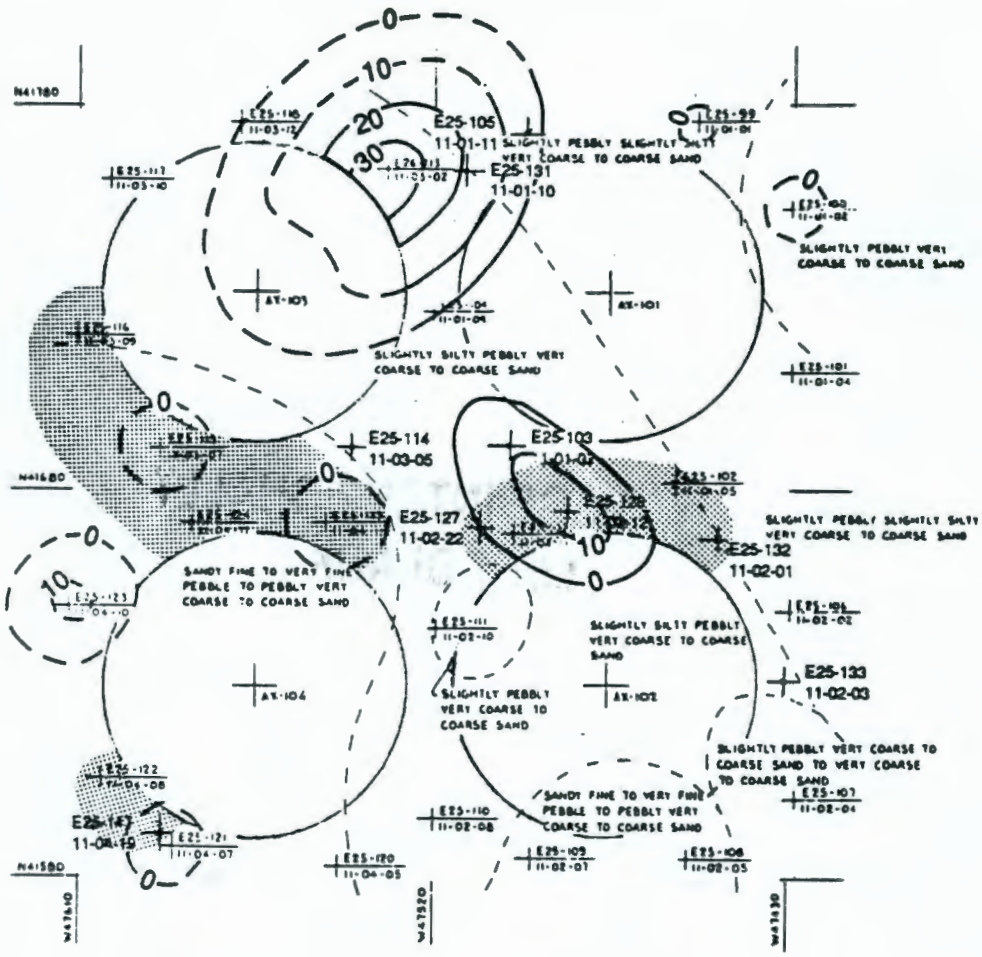

Areas of Fill and Pebbly Facies Contamination Identified on 1977 Vintage Logs.

Light Dashed Lines and Text Describe Geology Subcropping Fill.

Contour Interval: 10 feet
Dashed Where Inferred

Figure A1-26. 241-AX Tank Farm: Elevated Gamma Radiation Isopach Map.

9 2 1 2 6 5 1 1 2 2 6

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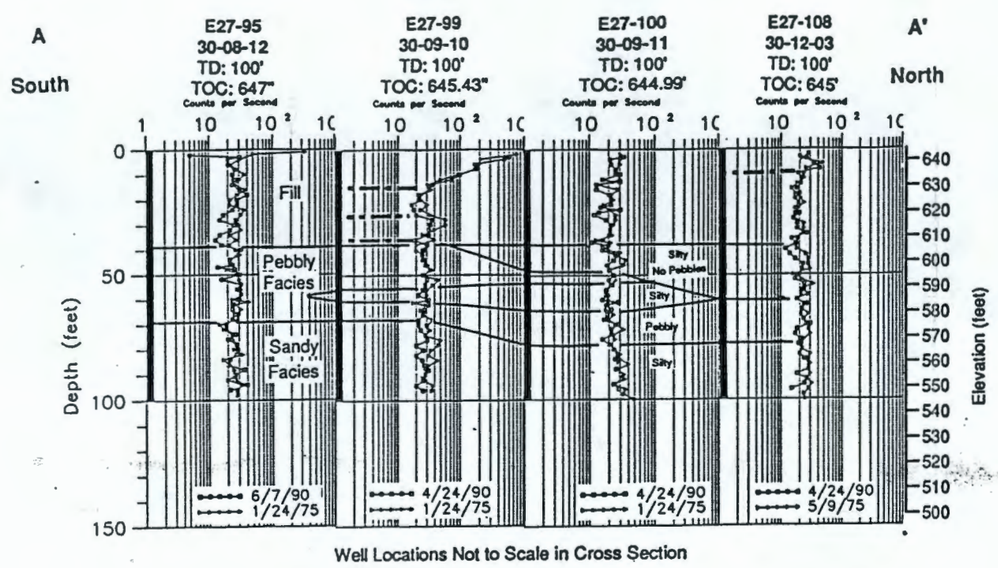
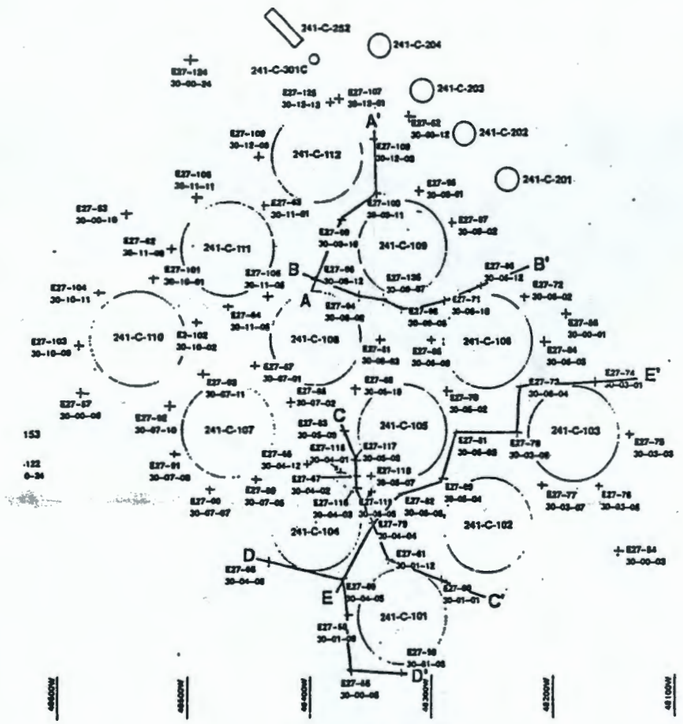
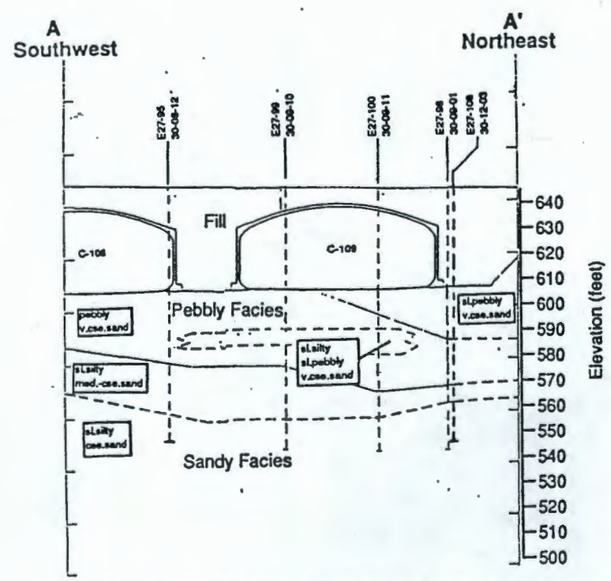




Source: Welty (1988)

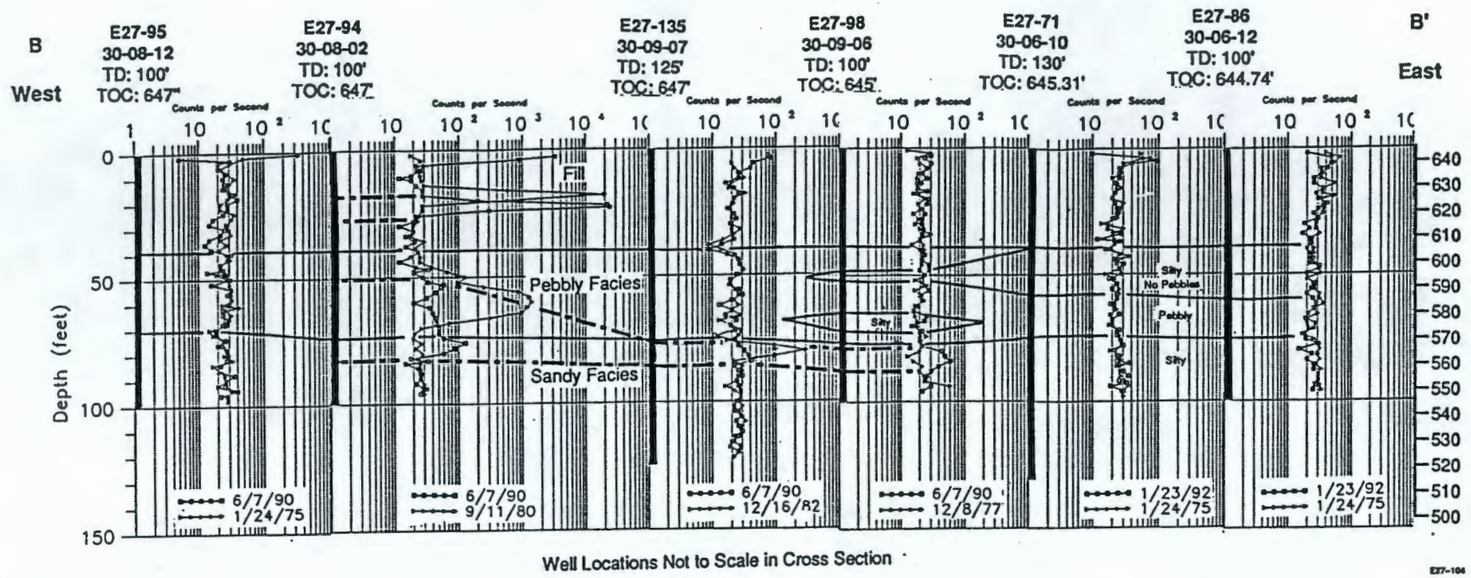


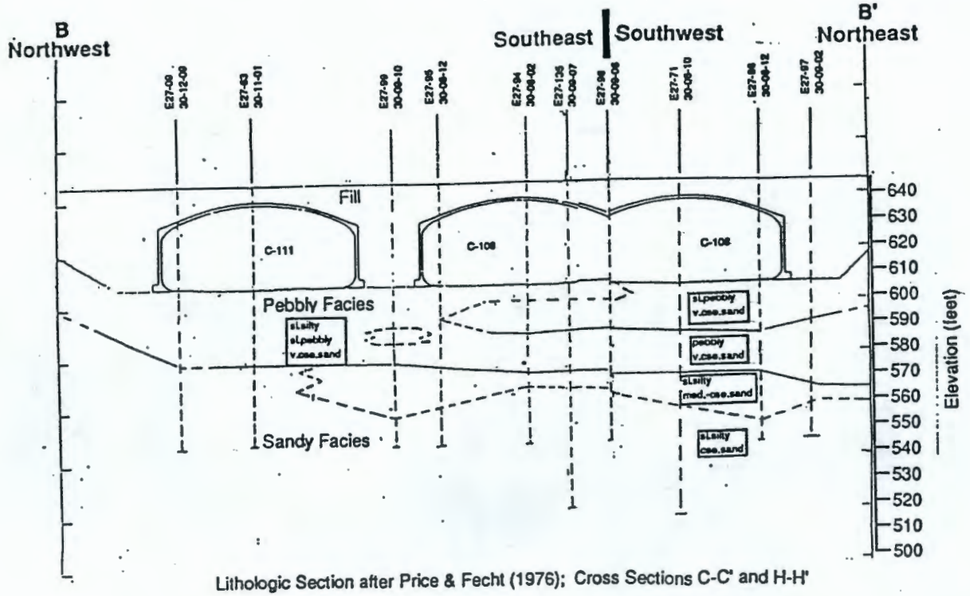
Lithologic Section after Price & Fecht (1976); Cross Section D-D'

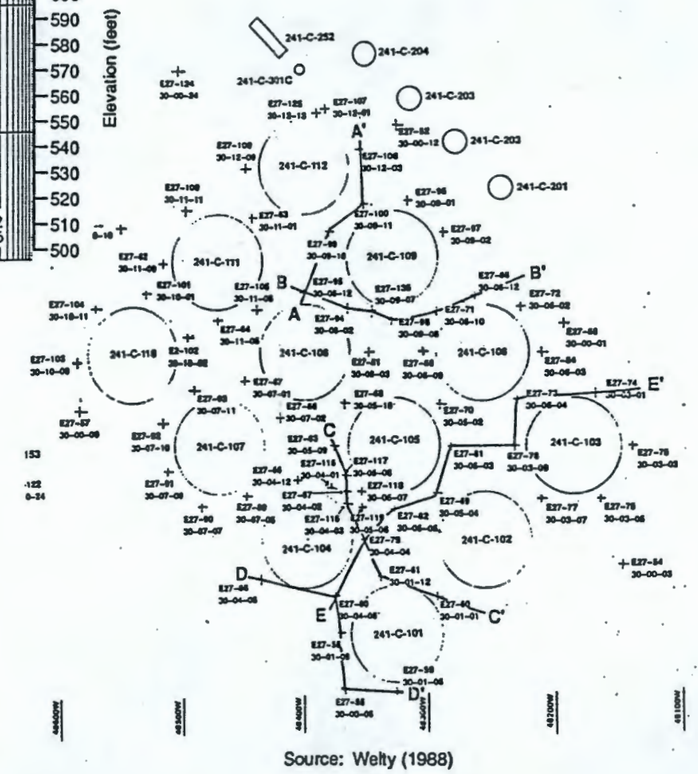
Explanation
——— Lithologic boundary
- - - - Elevated Radiation Boundary

Figure A1-27. 241-C Tank Farm: Scintillation Probe Profile Cross Section A-A'.

9 2 1 2 6 3 1 2 2 7







Explanation
Lithologic boundary
Elevated Radiation Boundary

Figure A1-28. 241-C Tank Farm: Scintillation Probe Profile Cross Sections B-B'.

9 2 1 2 6 3 1 2 2 8

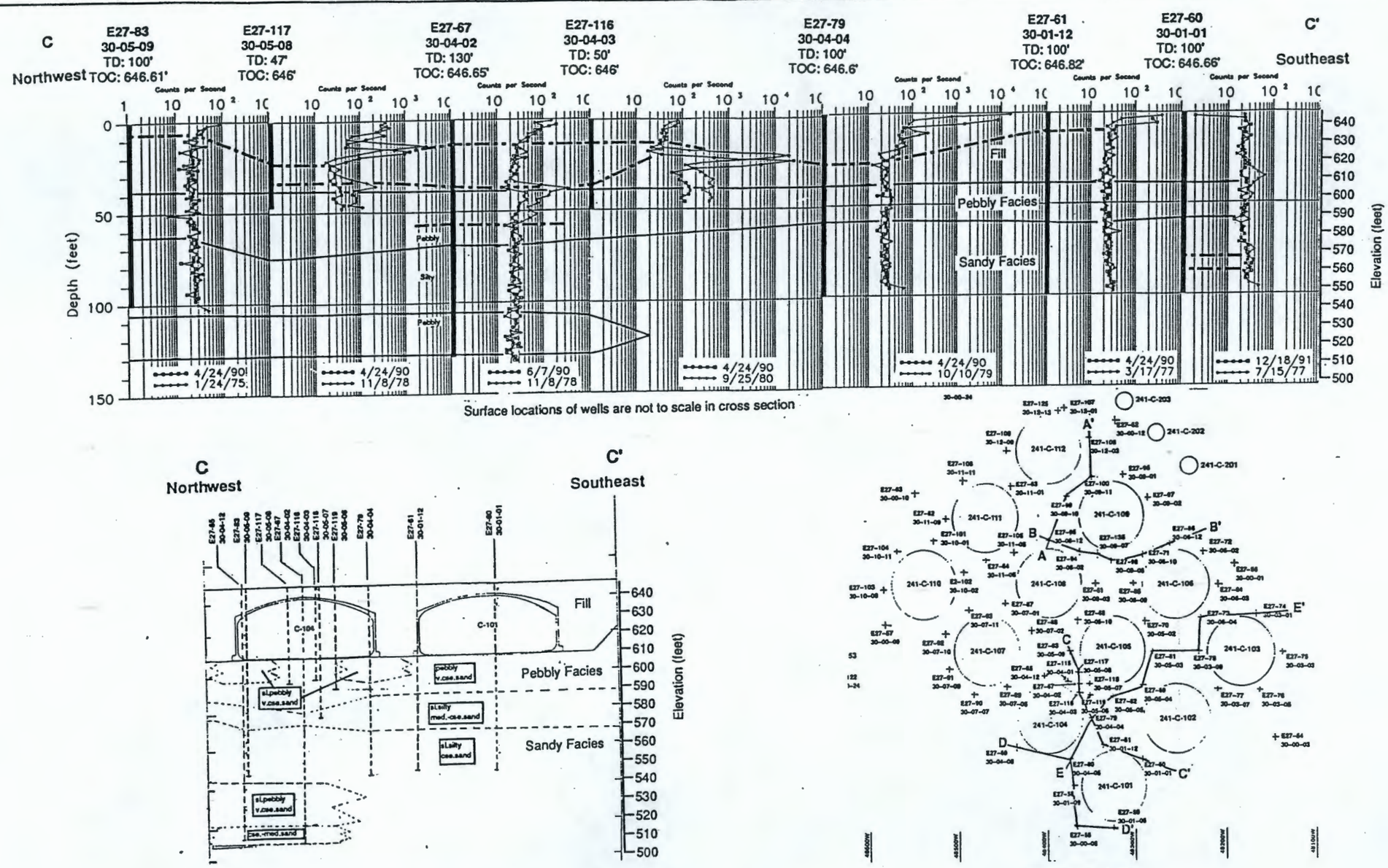


Figure A1-29. 241-C Tank Farm: Scintillation Probe Profile Cross Section C-C'.

9 2 1 2 6 3 1 2 2 9

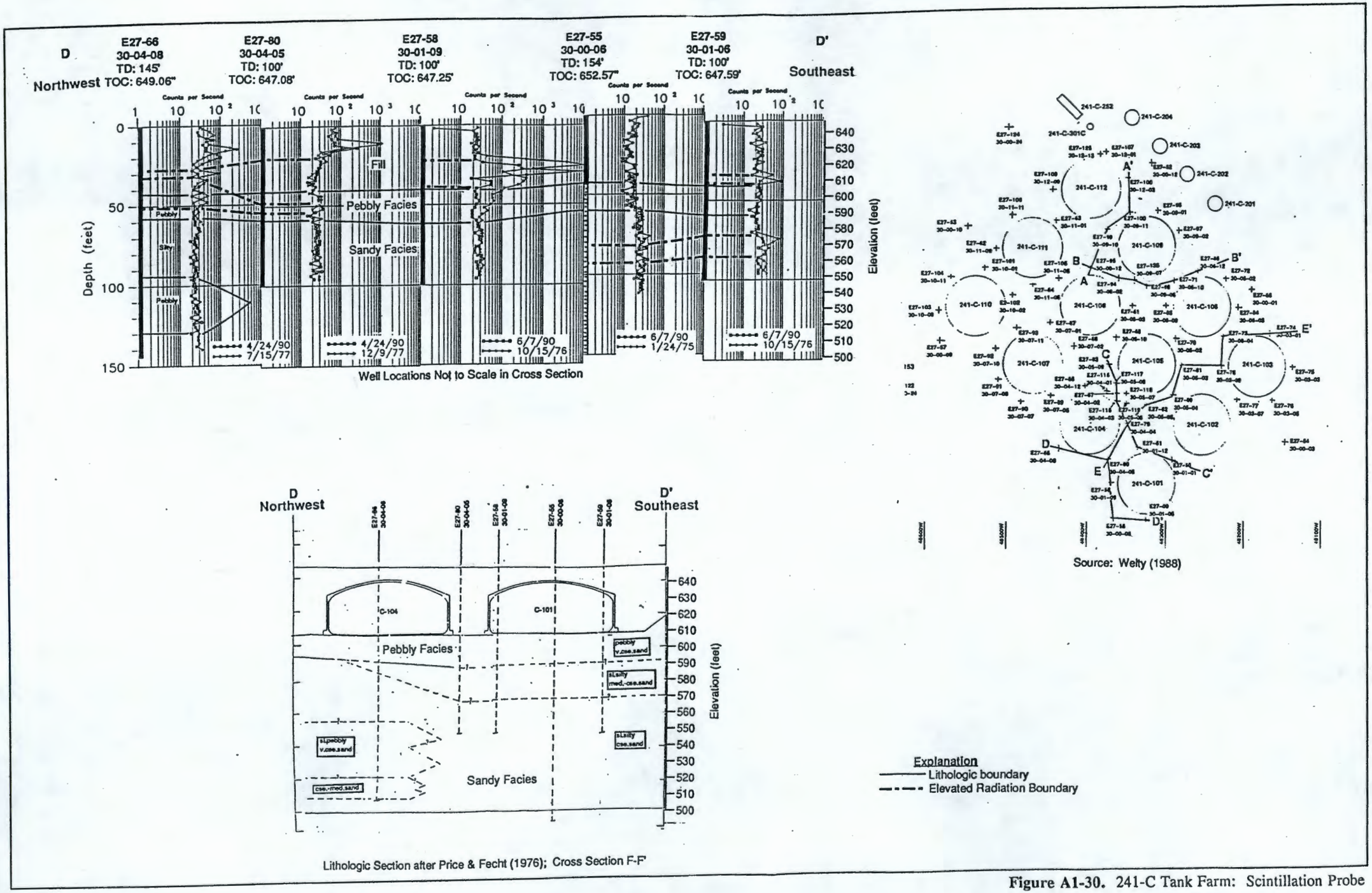


Figure A1-30. 241-C Tank Farm: Scintillation Probe Profile Cross Sections D-D'.

9 2 1 2 6 3 1 2 3 0

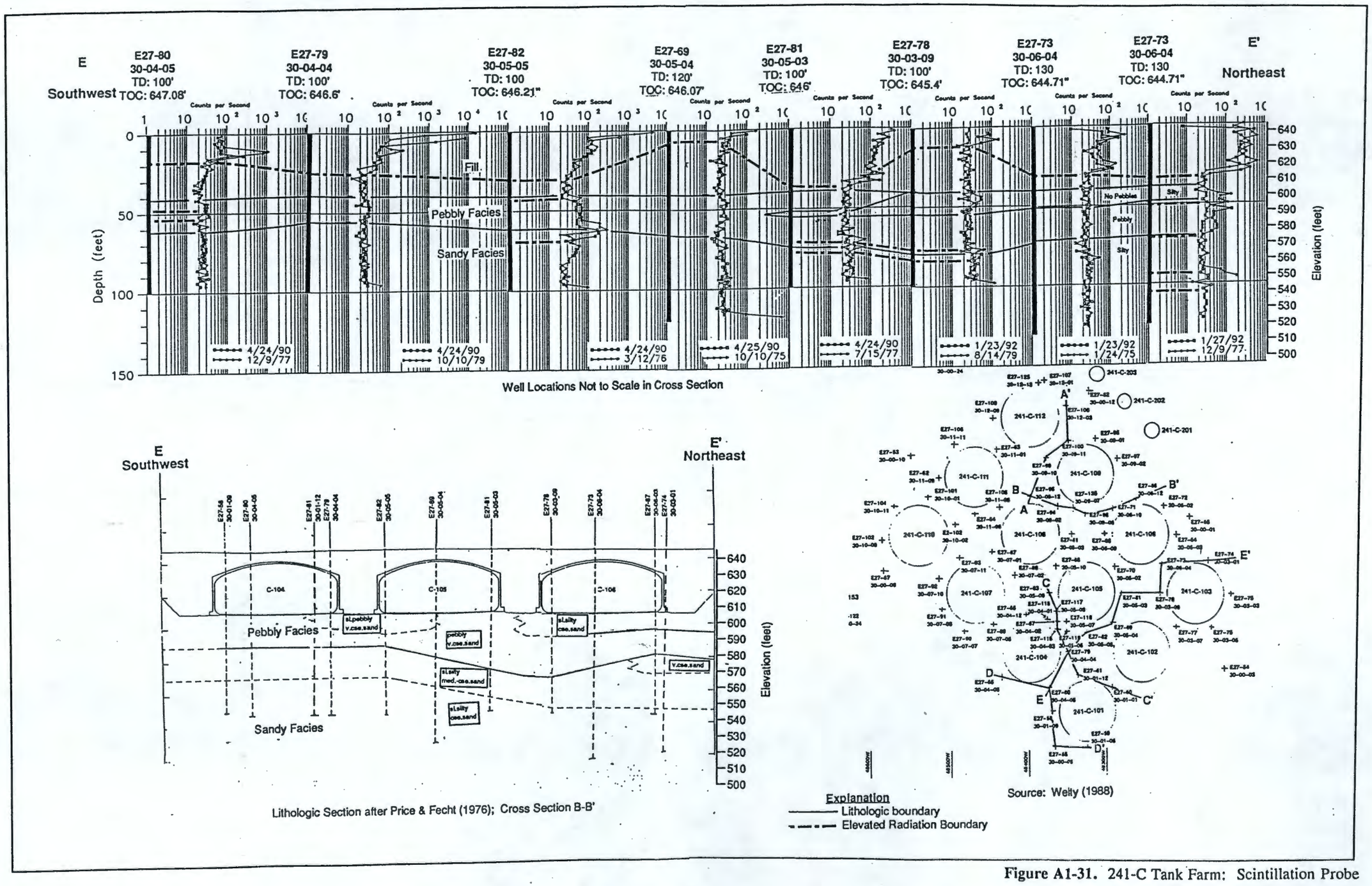


Figure A1-31. 241-C Tank Farm: Scintillation Probe Profile Cross Section E-E'.

9 2 1 2 6 3 1 2 3 1

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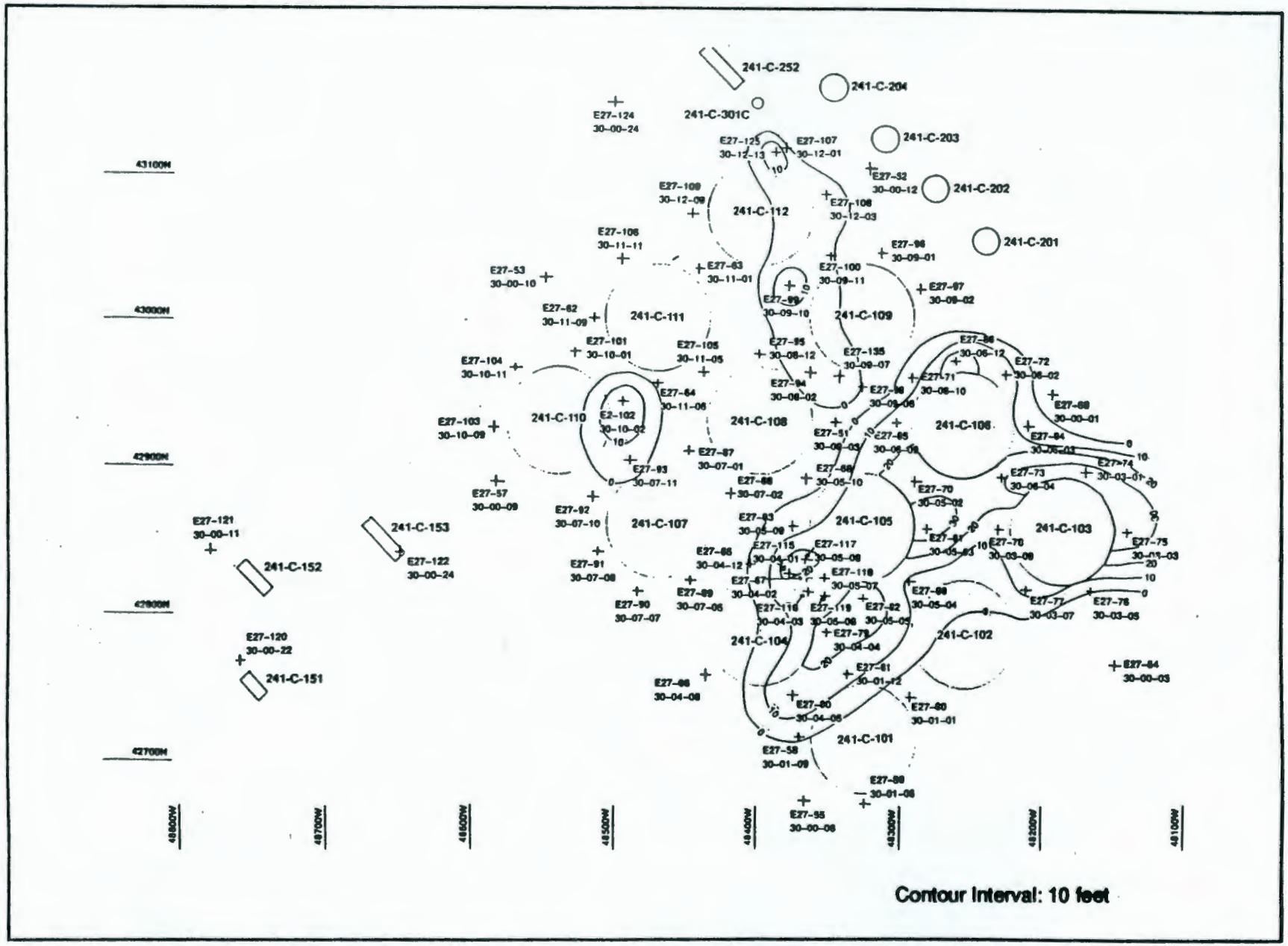

Figure A1-32. 241-C Tank Farm: Near Surface Elevated Gamma Radiation Isopach Map.

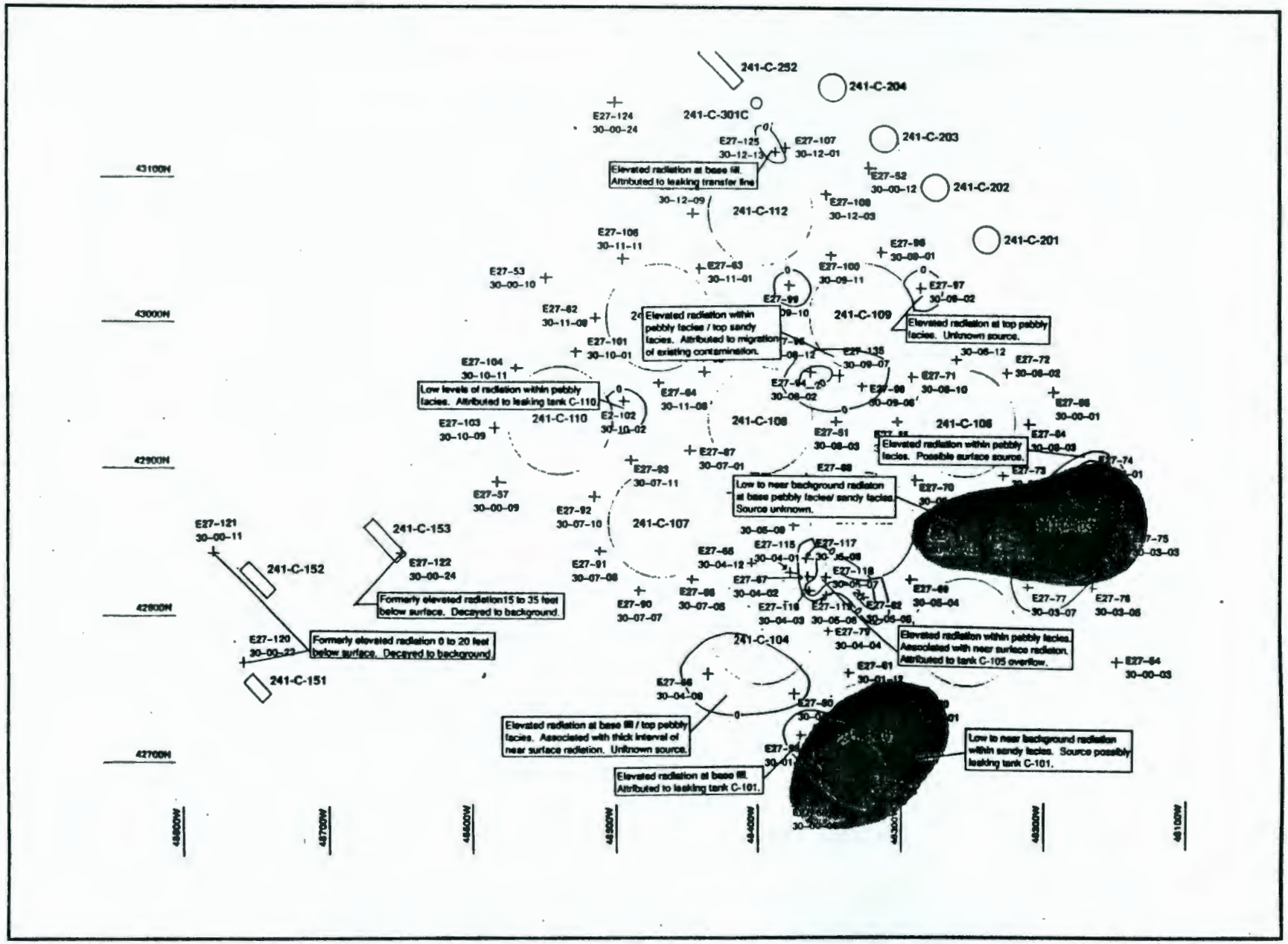

Figure A1-33. 241-C Tank Farm: Elevated Gamma Radiation within Fill and Pebbly Facies Isopach Map.

Table A1-1. Summary of Waste Management Unit Evaluation Results.

WMU	Description	Radiation Detected	Depth Interval (ft)	Evidence of Migration	Detected in Groundwater
216-A-1	Crib	Yes	27-42	No	No
216-A-7	Crib	Yes	0-15 27-42	No No	No
216-A-2	Crib	Yes	25-??	No	No
216-A-4	Crib	Yes	25-??	No	No
216-A-21	Crib	Unknown	---	---	---
216-A-26	French Drain*	Yes	25-??	No	No
216-A-26A	French Drain	Yes	25-??	No	No
216-A-27	Crib	Yes	20-140 280-320	No No	No
216-A-31	Crib	Unknown	---	---	---
216-A-36A	Crib	Yes	20-160 280-320	No	No
216-A-36B	Crib	Yes	20-135+	No	No
216-A-5	Crib	Yes	25-50	No	No
216-A-10	Crib	Yes	50-200	No	No
216-A-15	French Drain	Unknown	---	---	No
216-A-38	Crib	No	---	---	---
216-A-6	Crib	Yes	20-40	No	No
216-A-8	Crib*	Yes	0-120 145-180+	Yes	Unknown
216-A-18	Trench	No	---	---	---
216-A-19	Trench	No	---	---	---
216-A-20	Trench	No	---	---	---
216-A-24	Crib	Yes	0-123+	No	Unknown
216-A-29	Ditch*	Yes	18-31	Unknown	No
216-A-34	Ditch	No	---	---	---
216-A-524	Control Structure	No	---	---	---
216-A-9	Crib	No	---	---	---
216-A-40	Trench	No	---	---	---
216-A-30	Crib*	Yes	8-42	Yes	No
216-A-37-1	Crib*	No	---	---	---
216-A-37-2	Crib*	Unknown	---	---	---
216-A-42	Retention Basin*	No	---	---	---
216-A-45	Crib*	Yes	40-150+	Yes	Unknown
241-A-101 to 106	Tank Farm	Yes	0-100	Yes	No
241-AX-101 to 104	Tank Farm	Yes	0-39	Yes	No
241-C-101 to 112	Tank Farm	Yes			

* Unit is Currently Active.

9 2 1 2 6 1 1 2 3 4

Table A1-2. Details of Wells and Logs Used in Evaluation of 216-A-1 and -7 Waste Management Units.

Well #	Northing	Westing	TOC	TD	Perforations	Logs Used
E25-2	41270	47190	675.04	363	276-316	6/20/84 *
						2/20/76 *
						4/25/68
						5/14/63
						5/14/59
E25-54	41205	47169	674	150	---	9/23/86 *
						12/3/76 *

* Digitized Logs

Source: Westinghouse GIS Listing of Well Statistics.

Table A1-3. Details of Wells and Logs Used in Evaluation of 216-A-2, -4, -21, -26, -27, -31, and -36 Waste Management Units.

Well #	Northing	Westing	TOC	TD	Perforations	Logs Used	
E17-2	39063	48141	716.07	337	303-398	7/14/87	*
						2/19/76	*
						4/29/70	
						5/21/63	
E17-3	39066	48340	715.47	398	310-400	7/1/86	*
						4/28/76	*
						4/29/70	*
						4/16/68	*
						5/21/63	*
E17-4	38999	48480	717.05	379	298-398	7/14/87	*
						2/19/76	*
						4/29/70	
						4/16/68	
E17-5	38699	48560	718.69	328	298-335	9/29/82	*
						2/19/76	*
						4/28/70	
						4/16/68	
						10/18/65	
E17-6	38140	48499	720.1	499	300-460	4/27/76	
						4/29/70	
						7/2/65	
E17-7	38711	48599	719.19	377	300-385	9/19/88	*
						7/14/87	*
						4/28/76	*
						4/29/70	
						7/2/65	
E17-9	39027	48538	717.64	321	310-320	4/2/79	*
						4/28/76	
						4/29/70	*
						4/18/68	*
E17-10	38896	48650	714.74	325	310-320	9/19/86	*
						4/28/76	*
						4/29/70	*
E17-11	38924	48509	717.83	150	---	9/19/88	*
						9/29/82	*
E17-51	38540	48510	---	150	---	9/18/88	*
						9/29/82	*
E24-9	39295	48292	715.48	366	---	9/16/87	*
						2/19/76	*
						4/29/70	
						5/21/63	
E24-12	39219	48203	716.28	319	310-320	4/28/76	*
						4/29/70	*
E24-53	39515	48245	711	50	---	8/24/82	*
						4/28/76	*
						5/21/63	
E24-54	39542	48130	711	97	---	9/16/87	*
						5/21/63	

* Digitized Logs

Sources: Westinghouse GIS Listing of Well Statistics, Welty & Vermeulen (1989)

Table A1-4. Details of Wells and Logs Used in Evaluation of 216-A-5, -10, -15, and -38 Waste Management Units.

Well #	Northing	Westing	TOC	TD	Perforations	Logs Used	
E17-1	39053	48942	719.17	330	303-333	8/24/82	*
						4/28/76	*
						4/30/70	*
						4/17/63	*
						5/21/63	
						5/13/59	
						3/27/58	*
E17-8	39123	49247	718.38	362	303-362	4/28/76	
						4/30/70	
						4/17/68	
E24-1	39396	48761	716.22	338	300-341	9/16/87	*
						2/19/76	*
						4/29/70	
						5/21/63	
						5/13/59	
						3/27/58	*
E24-2	39404	48953	717.47	350	277-331	8/24/82	*
						2/19/76	*
						4/30/70	
						4/17/68	
						5/21/63	
						5/13/59	
E24-10	39379	48710	715.94	315	---	9/16/87	*
						4/2/79	*
						4/29/70	*
						4/17/68	*
						3/2/67	*
						10/13/65	*
E24-11	39371	49252	718.39	336	308-362	7/14/87	*
						2/19/76	*
						4/30/70	
						4/17/68	
E24-15	39300	48920	---	---	---	9/9/85	*
						12/10/82	*
E24-56	39350	48704	712	146	---	9/16/87	*
						4/28/76	*
						5/21/63	
						5/23/59	
E24-57	39447	48704	712	147	---	9/16/87	*
						4/28/76	*
						5/21/63	
						5/13/59	
E24-58	39397	48666	712	195	---	9/16/87	*
						4/28/76	*
						5/21/63	
						5/13/59	
E24-59	39215	48913	717.42	150	---	3/11/88	*
						11/17/82	*
						4/28/76	
						4/17/68	
						5/21/63	
						5/13/59	*
E24-60	39216	48984	718.59	200	---	9/30/88	*
						11/17/82	*
						4/28/76	
						4/17/68	
						5/21/63	
						5/13/59	*
E24-160	39320	48910	717.79	---	170-218	3/4/86	*

* Digitized Logs
Sources: Westinghouse GIS Listing of Well Statistics, Welty & Vermeullen (1989).

9 2 1 2 6 3 1 2 3 7

Table A1-5. Details of Wells and Logs Used in Evaluation of 216-A-6 Waste Management Unit.

Well #	Northing	Westing	TOC	TD	Perforations	Logs Used
E25-3	39980	46960	689.73	308	270-312	7/13/87 *
						2/20/76 *
						4/25/68
						5/13/63
						5/14/59
						4/28/58 *
E25-53	39795	47000	690.52	148	---	8/12/87 *
						5/5/76 *

* Digitized Logs

Source: Westinghouse GIS Listing of Well Statistics.

9 2 1 2 6 3 1 2 0 3

Table A1-6. Details of Wells and Logs Used in Evaluation of 216-A-8, -18, -19, -20, -24, -29, -34, and -524 Waste Management Units.

Well#	Northing	Westing	TOC	TD	Perforations	Logs Used	
E25-4	41615	46739	659.39	263	239-281	3/23/90	•
01-08-08						3/21/84	•
						2/20/76	
						5/14/63	
						6/1/59	
						2/19/58	•
E25-5	41667	46632	657.71	275	235-291	9/19/88	•
01-08-09						3/21/84	•
						4/30/76	
						5/14/63	
						6/1/59	
						2/19/58	
E25-6	41598°	46619°	658.31	274	234-288	3/23/90	•
01-08-07						9/30/82	•
						4/30/76	•
						4/25/68	
						5/14/63	
						6/3/59	
						2/19/58	•
E25-7	41709	46416	657.15	260	235-290	3/23/90	•
01-08-10						3/21/84	•
						4/30/76	
						4/25/68	
						5/14/63	
						6/1/59	
						2/19/58	•
E25-8	41682	46187	658.31	271	244-284	3/23/90	•
01-08-03						4/30/76	
						5/14/63	
						6/1/59	
						2/19/58	•
						12/3/76	•
E25-9	41779	45860	654.86	261	233-288	9/29/82	•
						2/20/76	
						4/25/68	
						5/14/63	
						6/1/59	
						2/19/58	•
E25-10	42000	46900	655.84	280	226-291	12/3/76	•
						12/12/58	•
E25-14	41600	46650	680"	204	---	3/4/87	•
						9/30/82	•
						4/30/76	•
						2/9/67	
E25-28	41424	45541	662.44	335	---	4/15/88	•
E25-169	41675	45550	---	---	---	9/30/82	•

•Digitized Logs
°Discrepency between GIS listing and Welty & Vermeulen (1989)
"TOC inconsistent with nearby wells.
Sources: Westinghouse GIS Listing of Well Statistics and Welty & Vermeulen (1989).

Table A1-6. Details of Wells and Logs Used in Evaluation of 216-A-8, -18, -19, -20, -24, -29, -34, and -524 Waste Management Units.

Well#	Northing	Easting	TOC	TD	Perforations	Logs Used	
E26-2	42400	45664	635.3	260	220-265	8/12/87	*
						4/30/76	*
						5/14/63	
						6/3/59	
						12/12/58	*
						4/29/58	*
E26-3	42324	46-57	641.18	261	222-272	8/12/87	*
						4/30/76	*
						5/14/63	
						6/3/59	
						12/12/58	*
						4/29/58	*
E26-4	42245	46449	647.76	280	225-281	8/12/87	*
						4/30/76	*
						5/14/63	
						6/3/59	
						12/12/58	*
E26-5	42172	46842	651.07	280	237-290	8/12/87	*
						2/20/76	*
						6/24/68	
						5/14/63	
						6/3/59	
						12/12/58	*
						5/27/58	*
						4/28/58	*
E26-7	42285	46650	647	211	---	6/20/84	*
						4/30/76	*
						2/9/67	
E26-53	42325	46605	650.33	---	---	6/21/84	*
E26-54	42355	46449	---	---	---	6/21/84	*

*Digitized Logs
Sources: Westinghouse GIS Listing of Well Statistics and Welty & Vermeulen (1989).

Table A1-7. Details of Wells and Logs Used in Evaluation of 216-A-9 and -40 Waste Management Units.

Well#	Northing	Westing	TOC	TD	Perforations	Logs Used	
E24-3	41011	48310	698.33	295	277-331	4/22/85	*
						2/19/76	*
						4/17/68	
						5/20/63	
						5/12/59	
E24-4	41182	48483	696.69	325	272-298	4/28/76	*
						4/18/68	*
						5/20/63	
						5/12/59	
E24-5	41275	48727	696.61	326	274-327	4/22/85	*
						4/28/76	*
						5/13/59	*
E24-63	41335	48644	695.97	50	---	9/23/86	*
						4/28/76	*
						4/18/68	*
E27-3	42000	48500	683.27	340	265-348	5/20/63	*
						5/12/59	*

*Digitized Logs
Sources: Westinghouse GIS Listing of Well Statistics, Fecht et al. (1977) and Welty & Vermeulen (1989

Table A1-8. Details of Wells and Logs Used in Evaluation of 216-A-30, -37, and -42 Waste Management Units.

Well#	Northing	Westing	TOC	TD	Perforations	Logs Used
E16-2	39151	45162	681.09	331	265-336	9/28/82 *
						4/29/76
						4/25/68
						5/13/63
E25-11	39611	46126	681.28	309	265-338	10/8/80 *
						2/26/63
						5/13/63
E25-12	39388	45655	680.95	337	265-338	3/23/90 *
						10/8/80 *
						4/29/76
						5/13/63
E25-17	40086	46570	690	292	273-295	3/23/90 *
						8/20/82 *
						8/23/78 *
						12/3/76 *
E25-18	40070	46187	679.05	291	269-294	6/29/88 *
						8/23/78 *
						12/3/76 *
E25-19	39935	46060	677.2	287	270-295	9/29/82 *
						1/5/82 *
						8/23/78 *
						12/3/76 *
E25-20	39925	45875	676.3	294	268-293	9/29/82 *
						1/5/82 *
						8/23/78 *
						12/3/76 *
E25-21	39609	45377	677.27	295	270-293	N/A
E25-22	39776	45589	674.02	295	---	N/A
E25-23	39308	44746	680.13	295	273-304	N/A
E25-24	39484	44949	679.55	293	270-290	N/A
E25-37	40462	45749	673.29	280	260-280	6/28/89 *
E25-38	40056	45469	673.52	280	260-280	7/5/89 *
E25-190	39700	46075"	---	50	---	3/23/90 *
						10/8/82 *
E25-191	39560	45800	---	50	---	3/23/90 *
						10/13/82 *
E25-193	39430	45532	---	60	---	9/23/90 *
						10/13/82 *

*Digitized Logs
"Coordinate changed to correspond to Welty & Vermeulen (1989).
N/A Not Available
Sources: Westinghouse GIS Listing of Well Statistics; Welty & Vermeulen (1989).

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Table A1-9. Details of Wells and Logs Used in Evaluation of 216-A-45 Waste Management Unit.

Well#	Northing	Westing	TOC	TD	Perforations	Logs Used	
E17-12	38200	47180	721.7	340	---	4/15/86	*
E17-13	38353	49040	719.25	---	---	8/11/86	*
E17-53	38266	49065	719.34	150	---	9/23/88	*
01-45-04							
E17-54	38354	49246	720.78	150	---	9/23/88	*
01-45-10							

*Digitized Logs
Source: Westinghouse GIS Listing of Well Statistics.

Table A1-10. Details of Wells and Logs Used in 241-A Tank Farm Evaluation.

Well #	Northing	Westing	TOC	TD	Logging Freq (/yr)	Logs Used
E25-57	41379	47565	687.47	150	1	Not Used
10-00-01						
E25-51	41357	47505	---	---	0	Not Used
10-00-02						
E25-58	41160	47540	688.02	151	1	Not Used
10-00-04						
E25-15	41125	47651	689.67	340	1	6/8/90
10-00-06						6/13/85
						4/5/77
E24-14	41125	47799	690.8	340	1	Not Used
10-00-07						
E24-13	41187	47875	691.05	308*	1	Not Used
10-00-08						
E24-64	41155	47819	685	80	0	Not Used
E25-97	41247	47781	689.09	125	52	Not Used
10-01-01						
E25-91	41213	47757	689.18	75	52	1/27/92
10-01-03						1/20/75
E25-92	41172	47770	689.57	125	52	1/20/92
10-01-04						10/29/84
						1/20/75
E25-1	41166	47759	690.21	315*	1	6/8/90
10-01-05						1/11/82
						4/4/77
E24-70	41157	47809	690.62	125	26	1/20/92
10-01-06						9/4/90
						1/22/85
						4/4/77
E24-71	41178	47845	690.48	125	26	1/20/92
10-01-08						1/22/85
						4/4/77
E24-75	41200	47853	691[2]	75	26	Not Used
10-01-09						
E24-72	41224	47850	689.89	125	26	Not Used
10-01-10						
E24-73	41250	47822	689.83	125	26	Not Used
10-01-11						
E25-192	41179	47772	689.5[2]	52	4	12/3/91
10-01-16						7/16/90
						1/10/85
						3/9/81
E25-204	41187	47768	689[2]	45	4	12/3/91
10-01-28						7/16/90
						1/22/85
						3/26/84
E24-65°	41170	47819	690	50	0	9/16/87

Sources: Welty & Vermeulen (1989); Price & Fecht (1976); Jacques (1972); Westinghouse GIS listing.
*TD from Westinghouse GIS listing used, differs from Welty & Vermeullen (1989).
°Logged by PNL.
#Coordinate used from Westinghouse GIS listing differs from Jacques (1972).
[2]Scaled from Price & Fecht (1976).

Table A1-10. Details of Wells and Logs Used in 241-A Tank Farm Evaluation.

Well #	Northing	Westing	TOC	TD	Logging Freq (/yr)	Logs Used
E25-90 10-02-01	41240	47670	687.87	125	26	1/20/92 9/4/90 1/21/85 4/4/77
E25-83 10-02-03	41201	47652	687.92	125	12	1/13/92 8/29/90 1/21/85 4/4/77
E25-85 10-02-05	41166	47675	688.57	125	26	1/20/92 9/4/90 1/20/85 4/4/77
E25-86 10-02-06	41158	47714	689.42	85*	12	1/13/92 8/29/90 1/21/85 4/4/77
E25-87 10-02-08	41184	47746	689.42	125	12	1/13/92 1/21/85 4/4/77
E25-88 10-02-10	41226	47746	688.88	125	12	1/13/92 7/30/90 4/4/77
E25-89 10-02-11	41250	47720	688.9	125	12	Not Used
E25-78 10-03-01	41250	47583	687.54	125	4	12/3/91 7/16/90 12/5/77
E25-79 10-03-02	41234	47553	687.3	125	4	12/3/91 7/16/90 12/5/77
E25-80 10-03-04	41180	47558	687.54	125	4	12/3/91 7/16/90 12/5/77
E25-81 10-03-05	41158	47591	688.12	125	4	12/3/91 7/16/90 12/5/77
E25-82 10-03-07	41168	47632	688.32	125	4	12/3/91 7/16/90 12/5/77
E25-55 10-03-10	41223	47651"	688.33	151	12	1/13/92 7/2/90 12/5/77
E25-84 10-03-11	41250	47635	687.53	75*	4	12/3/91 4/24/90 12/5/77

Sources: Welty & Vermeulen (1989); Price & Fecht (1976); Jacques (1972); Westinghouse GIS listing.
*TD from Westinghouse GIS listing used, differs from Welty & Vermeullen (1989).
•Logged by PNL.
"Coordinate used from Westinghouse GIS listing differs from Jacques (1972).

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Table A1-10. Details of Wells and Logs Used in 241-A Tank Farm Evaluation.

Well #	Northing	Westing	TOC	TD	Logging Freq (/yr)	Logs Used
E25-61	41345	47774	688.11	125	1	6/8/90
10-04-01						1/7/85
						7/12/77
E25-56	41283	47753	682.62	151	1	Not Used
10-04-04						
E25-63	41275	47768	688.43	130*	1	Not Used
10-04-05						
E24-66	41262	47819	689.36	125*	1	Not Used
10-04-07						
E24-67	41287	47849	689.35	125	1	Not Used
10-04-08						
E24-68	41328	47848	689.09	125*	1	Not Used
10-04-10						
E24-69	41355	47815	688.32	125*	1	Not Used
10-04-12						
E25-68	41335	47663	687.33	121*	1	6/8/90
10-05-02						1/3/77
E25-70	41264	47679	687.63	75	4	12/3/91
10-05-05						7/16/90
						1/10/85
						4/4/77
E25-71	41263	47721	688.48	74	1	Not Used
10-05-07						
E25-98	41274	47749	688.64	56	1	Not Used
10-05-08						
E25-62	41304	47753	688.21	125*	1	6/8/90
10-05-09						1/7/85
						4/4/77
E25-66	41340#	46637	687.65	125	1	6/8/90
10-05-10						9/12/78
						4/4/77
E25-67	41355	47697	687.48	125*	1	6/8/90
10-05-12						1/7/85
						4/4/77
E25-74	41337	47562	687.27	125	1	Not Used
10-06-02						
E25-75	41296	47552	686.9	125	1	Not Used
10-06-04						
E25-76	41264	47577#	687.15	75	1	Not Used
10-06-05						
E25-77	41264	47623#	687.25	125	1	Not Used
10-06-07						
E25-69	41304	47651	687	125	1	6/8/90
10-06-09						1/8/85
						4/4/77
E25-72	41338	47637	687.06	125	1	6/8/90
10-06-10						1/7/85
						4/4/77
E25-73	41356	47598	687	110*	1	6/8/90
10-06-12						1/7/85
						4/4/77

Sources: Welty & Vermeulen (1989); Price & Fecht (1976); Jacques (1972); Westinghouse GIS listing.
*TD from Westinghouse GIS listing used, differs from Welty & Vermeullen (1989).
°Logged by PNL.
#Coordinate used from Westinghouse GIS listing differs from Jacques (1972).

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Table A1-11. Details of Wells and Logs Used in 241-AX Tank Farm Evaluation.

Well #	Northing	Westing	TOC	TD	Logging Freq (/yr)	Logs Used
E25-99	41776	47453	681	100	12	1/20/92
11-01-01						1/22/85
						4/1/78
E25-100	41753	47429	680	100	12	1/20/92
11-01-02						1/22/85
						4/1/77
E25-101	41710	47429	681	100	12	1/20/92
11-01-04						1/22/85
						4/1/77
E25-102	41682	47458	681	100	12	1/20/92
11-01-05						1/22/85
						1/3/77
E25-105	41692	47500	681	102	18	1/27/92
11-01-07						1/22/85
						4/1/77
E25-104	41726	47520	680	103	18	1/27/92
11-01-09						1/22/85
						1/6/77
E25-131	41763*	47511*	680	73	18	1/27/92
11-01-10						1/22/85
						1/25/82
E25-105	41773	47495	680	100	18	1/27/92
11-01-11						1/22/85
						6/12/78
E25-132	41668*	47449*	681	125	1	6/14/90
11-02-01						6/12/85
						6/12/78
E25-106	41648	47429	682	100	1	Not Used
11-02-02						
E25-133	41629*	41728*	682	75	1	Not Used
11-02-03						
E25-107	41600	47428	680	100	1	Not Used
11-02-04						
E25-108	41585	47455	682	104	1	Not Used
11-02-05						
E25-109	41585*	47496*	682	99	1	Not Used
11-02-07						
E25-110	41595	47520	682	N/A	0	Not Used
11-02-08						
E25-111	41644	47519	681	100	1	6/14/90
11-02-10						6/12/85
						4/5/77
E25-112	41669	47499	681	101	1	6/14/90
11-02-11						6/28/75
E25-128	41675	47485	681	52	12	1/13/92
11-02-12						5/14/79
E25-127	41670	47508	681	125	1	6/14/90
11-02-22						6/12/85
						1/3/77

* Scaled from Drawing H-2-36935, Rev.4 (Tabasinski, 1978).
Sources: Welty & Vermeulen (1989); Tabasinski (1978).

Table A1-11. Details of Wells and Logs Used in 241-AX Tank Farm Evaluation.

Well #	Northing	Westing	TOC	TD	Logging Freq (/yr)	Logs Used
E25-113	41764	47532	680	102	4	1/4/91
11-03-02						1/6/77
E25-114	41691	47540	682	100	4	1/3/91
11-03-05						1/9/85
						1/6/77
E25-115	41691	47589	684	100	4	1/3/91
11-03-07						1/9/85
						4/5/77
E25-116	41720	47610	684	121	4	1/3/91
11-03-09						4/1/77
E25-117	41761	47602	681	99	4	1/3/91
11-03-10						1/9/85
						4/1/77
E25-118	41776	47569	681	100	4	Not Used
11-03-12						
E25-119	41672	47547	681	100	1	6/14/90
11-04-01						10/3/77
E25-120	41583	47544	682	100	1	Not Used
11-04-05						
E25-121	41585	47686	682	95	1	6/13/90
11-04-07						6/15/84
						10/5/77
E25-122	41605	47604	685	98	1	6/14/90
11-04-08						4/4/77
E25-123	41650	47612	685	101	1	6/14/90
11-04-10						6/13/84
						4/5/77
E25-124	41672	47581	682	125	1	6/14/90
11-04-11						6/13/84
						1/3/77
E25-147	41591	47588	685	125	1	6/14/90
11-04-19						6/13/84
						4/7/78

* Scaled from Drawing H-2-36935, Rev.4 (Tabasinski, 1978).
Sources: Welty & Vermeulen (1989); Tabasinski (1978).

Table A1-12. Details of Wells and Logs Used in 241-C Tank Farm Evaluation.

Well #	Northing	Westing	TOC	TD	Logging Freq. (/yr)	Logs Used
E27-56 30-00-01	42954	48191	639.17	145°	4	Not Used
E27-54 30-00-03	42771	48149	651.57	155°	4	Not Used
E27-55 30-00-06	42677	48370	652.57	154°	1	6/7/90 1/24/75
E27-57 30-00-09	42889	48583	653.46	150°	4	4/24/90 1/24/75
E27-53 30-00-10	43029	48549	649.17	150°	1	Not Used
E27-121 30-00-11	42840	48780	---	60	1	6/7/90 12/9/77
E27-52 30-00-12	43096	48322	645.96	150°	1	Not Used
E27-123 30-00-13	43150	48500	---	60	1	Not Used
E27-120 30-00-22	42770	48760	---	60	1	6/14/90 12/9/77
E27-122 30-00-24	42840	48650	---	60	1	6/7/90 12/9/77
E27-60 30-01-01	42747	48295	646.66	100	12	12/18/91 7/15/77
E27-59 30-01-06	42676	48328	647.59	100	1	6/7/90 10/15/76
E27-58 30-01-09	42719	48373	647.25	100	1	6/7/90 10/15/76
E27-61 30-01-12	42762	48339	646.82	100	4	4/24/90 3/17/77
E27-74 30-03-01	42901	48168	645	125	26	1/27/92 12/9/77
E27-75 30-03-03	42861	48140	645	100	17	1/23/92 5/7/79
E27-76 30-03-05	42820	48165	645	100	17	1/23/92 1/24/75
E27-77 30-03-07	42825	48215	645.64	100	12	1/16/92 1/24/75
E27-78 30-03-09	42861	48231	---	100	17	1/23/92 8/14/79

* Log collected with Probe #2 (shielded probe) not with Probe #4 (unshielded).

o Bottom 100 feet of well is perforated.

Sources: Westinghouse GIS Listing of Well Statistics;
Welty & Vermeulen (1989); Welty (1988).

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Table A1-12. Details of Wells and Logs Used in 241-C Tank Farm Evaluation.

Well #	Northing	Westing	TOC	TD	Logging Freq. (/yr)	Logs Used
E27-115 30-04-01	42829	48378	646	50	4	4/24/90 1/24/75
E27-67 30-04-02	42827	48365	646.65	130	1	6/7/90 11/8/78
E27-116 30-04-03	42817	48365	646	50	4	4/24/90 9/25/80
E27-79 30-04-04	42790	48352	646.6	100	4	4/24/90 10/10/79
E27-80 30-04-05	42748	48377	647.08	100	4	4/24/90 12/9/77
E27-66 30-04-08	42759	48437	649.06	145	4	4/24/90 7/15/77
E27-65 30-04-12	42835	48405	647.21	135	4	4/24/90 1/24/75
E27-70 30-05-02	42893	48290	645.7	126	4	4/24/90 10/6/78
E27-81 30-05-03	42861	48282	646	100	4	4/24/90 7/15/77
E27-69 30-05-04	42825	48294	646.07	120	4	4/25/90 10/10/75
E27-82 30-05-05	42813	48328	646.21	100	4	4/24/90 3/12/76
E27-119 30-05-06	42814	48353	646	55	4	4/24/90 9/15/78
E27-118 30-05-07	42826	48353	646	66	4	4/24/90 * 11/2/76 * 2/14/75
E27-117 30-05-08	42838	48367	646	47	4	4/24/90 11/8/78
E27-83 30-05-09	42861	48375	646.61	100	4	4/24/90 1/24/75
E27-68 30-05-10	42893	48366	646.23	135	4	4/24/90 3/10/82
E27-72 30-06-02	42967	48244	645.33	125	17	1/23/92 1/24/75
E27-84 30-06-03	42933	48209	644.8	100	17	1/23/92 7/15/77
E27-73 30-06-04	42897	48288	644.71	130	17	1/23/92 1/24/75
E27-85 30-06-09	42932	48302	645.44	100	17	1/23/92 1/24/75
E27-71 30-06-10	42963	48291	645.31	130	17	1/23/92 1/24/75
E27-86 30-06-12	42976	48260	644.74	100	26	1/23/92 1/24/75

* Log collected with Probe #2 (shielded probe) not with Probe #4 (unshielded).

o Bottom 100 feet of well is perforated.

Sources: Westinghouse GIS Listing of Well Statistics;
Welty & Vermeulen (1989); Welty (1988).

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Table A1-12. Details of Wells and Logs Used in 241-C Tank Farm Evaluation.

Well #	Northing	Westing	TOC	TD	Logging Freq. (/yr)	Logs Used
E27-87 30-07-01	42911	48448	646	100	4	Not Used
E27-88 30-07-02	42883	48419	646	100	4	Not Used
E27-89 30-07-05	42823	48447	646	100	4	Not Used
E27-90 30-07-07	42815	48485	646	99	4	Not Used
E27-91 30-07-08	42842	48512	646	99	4	Not Used
E27-92 30-07-10	42879	48515	646	100	4	Not Used
E27-93 30-07-11	42898	48489	646.59	100	4	4/25/90 1/24/75
E27-94 30-08-02	42965	48363	647	100	1	6/7/90 9/11/80
E27-51 30-08-03	42932	48345	646.96	150°	1	Not Used
E27-95 30-08-12	42978	48398	647	100	1	6/7/90 1/24/75
E27-96 30-09-01	43047	48313	644.85	100	1	6/7/90 1/24/75
E27-97 30-09-02	43023	48284	645.17	100	1	6/7/90 6/7/79
E27-98 30-09-06	42956	48327	645	100	1	6/7/90 12/8/77
E27-135 30-09-07	42965	48342	---	125	1	6/7/90 12/16/82
E27-99 30-09-10	43026	48385	645.43	100	4	4/24/90 1/24/75
E27-100 30-09-11	43045	48349	644.99	100	4	4/24/90 1/24/75
E27-101 30-10-01	42979	48528	646	100	4	4/25/90 1/24/75
E27-102 30-10-02	42945	48494	646.52	100	4	4/24/90 1/24/75
E27-103 30-10-09	42926	48585	646	100	4	4/14/90 7/15/77
E27-104 30-10-11	42967	48570	646	100	4	4/25/90 9/11/79

* Log collected with Probe #2 (shielded probe) not with Probe #4 (unshielded).

o Bottom 100 feet of well is perforated.

Sources: Westinghouse GIS Listing of Well Statistics;
Welty & Vermeulen (1989); Welty (1988).

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Table A1-12. Details of Wells and Logs Used in 241-C Tank Farm Evaluation.

Well #	Northing	Westing	TOC	TD	Logging Freq. (/yr)	Logs Used
E27-63 30-11-01	43036	48441	645.77	100	4	4/24/90 1/31/75
E27-105 30-11-05	42964	48438	646	100	1	Not Used
E27-64 30-11-06	42957	48469	646.49	100	1	6/7/90 1/24/75
E27-62 30-11-09	43002	48514	646.37	100	1	Not Used
E27-106 30-11-11	43043	48495	646	100	1	Not Used
E27-107 30-12-01	43120	48380	645	100	4	4/24/90 9/11/79
E27-108 30-12-03	43088	48352	645	100	4	4/24/90 5/9/75
E27-109 30-12-09	43074	48446	645	100	4	4/24/90 10/9/79
E27-125 30-12-13	43116	48387	---	116	4	4/24/90 5/9/79

* Log collected with Probe #2 (shielded probe) not with Probe #4 (unshielded).

o Bottom 100 feet of well is perforated.

Sources: Westinghouse GIS Listing of Well Statistics;
Welty & Vermeulen (1989); Welty (1988).

9 2 1 2 6 3 1 2 5 2

APPENDIX A.2

SAMPLE DATA

9 2 1 2 6 3 1 2 5 3

Table A-2.1. Results of Grid Soil Sampling (pCi/g)
Location 2E11

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	--	--	--	--	--	--	--	--	--	--	--
Ce-144	--	--	2.10E-01	1.90E-01	--	--	< 6.00E-02	1.30E-01	--	--	1.35E-01
Co-58	*	--	--	--	--	--	< -5.00E-03	1.70E-02	--	--	5.00E-03
Co-60	*	--	2.00E-02	2.00E-02	--	--	< 7.70E-03	1.70E-02	--	--	1.39E-02
Cs-134	*	--	8.00E-02	3.00E-02	--	--	< -2.40E-04	1.90E-02	--	--	3.99E-02
Cs-137	1.30E+01	8.33E-01	1.40E+01	1.42E+00	--	--	8.60E+00	8.70E-01	--	--	1.19E+01
Eu-152	1.82E-01	1.65E-01	2.30E-01	9.00E-02	--	--	1.20E-01	9.90E-02	--	--	1.77E-01
Eu-154	*	--	--	--	--	--	< -5.50E-02	5.40E-02	--	--	5.50E-02
Eu-155	*	--	--	--	--	--	< 1.80E-02	7.10E-02	--	--	1.80E-02
I-129	--	--	--	--	--	--	--	--	--	--	--
K-40	--	--	--	--	--	--	--	--	--	--	--
Mn-54	*	--	--	--	--	--	2.60E-02	1.60E-02	--	--	2.60E-02
Nb-95	*	--	--	--	--	--	--	--	--	--	--
Pb-212	--	--	--	--	--	--	--	--	--	--	--
Pb-214	--	--	--	--	--	--	7.90E-01	1.10E-01	--	--	7.90E-01
Pu-238	2.60E-03	8.00E-04	1.00E-03	5.00E-04	--	--	8.60E-04	6.50E-04	--	--	1.49E-03
Pu-239	7.30E-02	8.00E-03	7.30E-02	8.00E-03	--	--	4.20E-02	6.20E-03	--	--	6.27E-02
Ru-106	*	--	--	--	--	--	< 3.50E-02	1.80E-01	--	--	3.50E-02
Sr-90	2.18E+00	3.98E-01	8.90E-01	1.70E-01	--	--	2.70E+00	5.10E-01	--	--	1.92E+00
Tc-99	--	--	--	--	--	--	--	--	--	--	--
U (total)	3.85E-01	1.26E-01	3.70E-01	1.20E-01	--	--	1.80E-01	6.40E-02	--	--	3.12E-01
Zn-65	*	--	--	--	--	--	< -1.60E-02	4.20E-02	--	--	1.60E-02
Zr-95	*	--	--	--	--	--	< 1.40E-02	3.30E-02	--	--	1.40E-02

Table A-2.1. Results of Grid Soil Sampling (pCi/g)
Location 2E12

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	--	--	--	--	< -4.40E-03	3.50E-02	--	--	1.02E-01	1.51E-01	4.88E-02
Ce-144	--	--	3.00E-01	2.60E-01	< -7.00E-03	9.70E-02	< -1.10E-02	1.10E-01	1.45E-01	2.29E-01	1.07E-01
Co-58	*	--	--	--	< -6.40E-03	1.80E-02	< -4.80E-03	1.60E-02	8.28E-03	2.27E-02	6.49E-03
Co-60	*	--	--	--	< -2.60E-03	2.00E-02	< 7.40E-04	1.60E-02	1.69E-02	2.29E-02	5.01E-03
Cs-134	6.60E-02	3.40E-02	8.00E-02	3.00E-02	4.50E-02	2.00E-02	< -8.50E-03	1.80E-02	2.73E-02	3.30E-02	4.20E-02
Cs-137	1.21E+01	7.84E-01	2.55E+01	2.56E+00	1.50E-01	3.00E-02	6.80E+00	6.90E-01	2.35E+01	2.36E+00	1.36E+01
Eu-152	*	--	--	--	1.10E-01	8.80E-02	< 6.80E-02	7.10E-02	1.75E-02	1.03E-01	6.52E-02
Eu-154	*	--	--	--	< 4.60E-02	5.00E-02	< -1.80E-02	5.20E-02	2.54E-02	7.07E-02	1.78E-02
Eu-155	*	--	1.90E-01	1.50E-01	7.00E-02	5.40E-02	7.30E-02	6.20E-02	4.85E-02	1.02E-01	9.54E-02
I-129	--	--	--	--	--	--	--	--	2.37E-02	2.79E-01	2.37E-02
K-40	--	--	--	--	--	--	--	--	1.19E+01	1.46E+00	1.19E+01
Mn-54	*	--	3.00E-02	2.00E-02	2.20E-02	1.50E-02	2.10E-02	1.50E-02	1.24E-02	2.47E-02	2.14E-02
Nb-95	*	--	--	--	--	--	--	--	1.21E-01	6.42E-02	1.21E-01
Pb-212	--	--	--	--	--	--	--	--	7.85E-01	1.07E-01	7.85E-01
Pb-214	--	--	--	--	--	--	7.40E-01	1.10E-01	6.42E-01	1.30E-01	6.91E-01
Pu-238	9.00E-04	5.00E-04	1.00E-03	5.00E-04	4.50E-04	2.50E-04	< 4.40E-04	5.70E-04	4.18E-03	7.82E-04	1.39E-03
Pu-239	2.80E-02	4.00E-03	4.20E-02	5.00E-03	7.40E-03	1.20E-03	1.60E-02	3.70E-03	1.05E-01	1.10E-02	3.97E-02
Ru-106	*	--	--	--	< 2.10E-02	1.30E-01	< -2.20E-01	1.80E-01	1.98E-01	3.22E-01	1.46E-01
Sr-90	1.36E+00	2.48E-01	2.10E+00	3.80E-01	4.10E-01	1.00E-01	6.50E-01	1.30E-01	1.67E+00	3.20E-01	1.24E+00
Tc-99	--	--	--	--	--	--	--	--	3.41E-01	1.07E+00	3.41E-01
U (total)	2.79E-01	9.50E-02	2.20E-01	8.00E-02	1.30E-01	4.30E-02	2.10E-01	7.00E-02	1.92E-01	6.32E-02	2.06E-01
Zn-65	*	--	--	--	< -3.20E-02	4.70E-02	< -1.20E-01	4.80E-02	2.27E-02	5.80E-02	5.82E-02
Zr-95	9.80E-02	6.10E-02	8.00E-02	6.00E-02	5.00E-02	2.90E-02	< 1.30E-02	2.90E-02	3.52E-02	6.06E-02	5.52E-02

Table A-2.1. Results of Grid Soil Sampling (pCi/g)
Location 2E17

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	--	--	--	--	4.10E-02	3.80E-02	--	--	6.65E-02	9.90E-02	5.38E-02
Ce-144	--	--	--	--	< -8.40E-02	1.30E-01	< 5.60E-02	1.50E-01	6.51E-02	1.27E-01	1.24E-02
Co-58	*	--	5.00E-02	3.00E-02	2.30E-02	1.40E-02	< 6.00E-04	1.80E-02	8.00E-03	2.67E-02	2.04E-02
Co-60	*	--	--	--	< -1.20E-02	1.90E-02	< -3.00E-03	2.00E-02	7.69E-03	1.89E-02	7.56E-03
Cs-134	*	--	5.00E-02	4.00E-02	3.70E-02	2.10E-02	< -1.80E-03	2.10E-02	4.23E-02	2.16E-02	3.19E-02
Cs-137	3.37E+00	2.51E-01	2.19E+00	2.50E-01	5.70E+00	5.90E-01	6.40E+00	6.50E-01	4.07E+00	4.19E-01	4.35E+00
Eu-152	*	--	--	--	< -5.50E-02	9.80E-02	8.40E-02	8.30E-02	1.19E-01	8.41E-02	4.93E-02
Eu-154	2.16E-01	1.03E-01	--	--	< 4.40E-02	5.40E-02	< -3.30E-02	6.10E-02	3.35E-02	5.68E-02	6.51E-02
Eu-155	*	--	--	--	< -2.80E-02	7.50E-02	< 2.30E-02	8.10E-02	4.67E-02	7.11E-02	1.39E-02
I-129	--	--	--	--	--	--	--	--	3.55E-02	2.63E-01	3.55E-02
K-40	--	--	--	--	--	--	--	--	1.50E+01	1.69E+00	1.50E+01
Mn-54	*	--	--	--	< 1.90E-03	1.90E-02	< 1.40E-02	1.70E-02	5.78E-04	2.07E-02	5.49E-03
Nb-95	*	--	--	--	--	--	--	--	7.69E-02	6.96E-02	7.69E-02
Pb-212	--	--	--	--	--	--	--	--	7.90E-01	9.26E-02	7.90E-01
Pb-214	--	--	--	--	--	--	5.40E-01	9.10E-02	6.17E-01	8.87E-02	5.79E-01
Pu-238	*	--	--	--	4.60E-04	3.90E-04	1.30E-03	5.60E-04	4.81E-04	2.60E-04	7.47E-04
Pu-239	2.00E-02	5.00E-03	7.00E-03	2.00E-03	1.70E-02	2.80E-03	3.20E-02	4.30E-03	4.09E-02	4.70E-03	2.34E-02
Ru-106	*	--	--	--	2.60E-01	1.70E-01	< -2.60E-02	2.00E-01	2.05E-01	1.94E-01	1.46E-01
Sr-90	2.71E+00	4.89E-01	3.04E+00	5.60E-01	5.20E+00	1.30E+00	3.40E+00	6.20E-01	3.10E+00	6.17E-01	3.49E+00
Tc-99	--	--	--	--	--	--	--	--	2.35E-01	1.06E+00	2.35E-01
U (total)	2.57E-01	8.90E-02	2.20E-01	7.00E-02	1.60E-01	5.20E-02	2.20E-01	7.20E-02	2.88E-01	9.07E-02	2.29E-01
Zn-65	*	--	--	--	< -9.60E-02	5.40E-02	< -3.00E-02	4.70E-02	8.76E-02	5.61E-02	7.12E-02
Zr-95	1.05E-01	6.60E-02	--	--	< 1.10E-02	3.60E-02	< 1.90E-02	3.20E-02	2.90E-02	5.98E-02	4.10E-02

Table A-2.1. Results of Grid Soil Sampling (pCi/g)
Location 2E18

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	--	--	--	--	< -2.40E-02	3.90E-02	--	--	1.35E-03	9.21E-02	1.27E-02
Ce-144	--	--	--	--	< -2.60E-02	1.10E-01	< 1.40E-02	1.10E-01	-2.71E-02	1.25E-01	2.24E-02
Co-58	*	--	--	--	< 1.40E-03	1.60E-02	< -2.20E-02	1.70E-02	8.06E-03	2.50E-02	1.05E-02
Co-60	*	--	--	--	< 1.00E-02	1.40E-02	< -9.50E-03	1.70E-02	7.46E-03	1.55E-02	2.65E-03
Cs-134	4.30E-02	2.90E-02	9.00E-02	3.00E-02	3.20E-02	1.90E-02	< -3.80E-02	1.90E-02	5.57E-03	1.72E-02	2.65E-02
Cs-137	5.15E+00	3.49E-01	1.03E+01	1.05E+00	4.60E+00	4.70E-01	3.20E+00	3.30E-01	7.96E+00	8.06E-01	6.24E+00
Eu-152	1.77E-01	1.08E-01	1.30E-01	1.00E-01	7.60E-02	6.60E-02	< 3.50E-02	7.80E-02	1.79E-02	8.11E-02	8.72E-02
Eu-154	*	--	--	--	7.10E-02	4.20E-02	< 7.50E-03	5.60E-02	3.95E-03	4.98E-02	2.75E-02
Eu-155	*	--	--	--	< 3.90E-03	6.10E-02	< 5.10E-02	7.20E-02	5.98E-02	6.07E-02	3.82E-02
I-129	--	--	--	--	--	--	--	--	1.85E-01	4.53E-01	1.85E-01
K-40	--	--	--	--	--	--	--	--	1.51E+01	1.67E+00	1.51E+01
Mn-54	*	--	--	--	3.10E-02	1.50E-02	< 1.10E-02	1.60E-02	1.06E-02	1.74E-02	1.75E-02
Nb-95	*	--	--	--	--	--	--	--	3.44E-02	6.23E-02	3.44E-02
Pb-212	--	--	--	--	--	--	--	--	7.48E-01	8.78E-02	7.48E-01
Pb-214	--	--	--	--	--	--	6.30E-01	8.80E-02	7.48E-01	1.02E-01	6.89E-01
Pu-238	6.00E-04	4.00E-04	4.00E-04	3.00E-04	< 2.10E-05	1.10E-04	< 7.30E-05	1.00E-04	2.23E-04	1.62E-04	2.63E-04
Pu-239	1.10E-02	2.00E-03	1.10E-02	2.00E-03	6.80E-03	1.20E-03	6.20E-03	1.10E-03	1.49E-02	1.95E-03	9.98E-03
Ru-106	*	--	--	--	< -4.60E-02	1.60E-01	< 5.50E-02	1.60E-01	-8.82E-02	1.79E-01	6.31E-02
Sr-90	1.18E+00	2.17E-01	1.29E+00	2.40E-01	1.20E+00	3.00E-01	5.60E-01	1.10E-01	2.40E+00	4.75E-01	1.33E+00
Tc-99	--	--	--	--	--	--	--	--	6.86E-01	1.10E+00	6.86E-01
U (total)	4.30E-01	1.38E-01	3.80E-01	1.20E-01	2.60E-01	7.70E-02	2.10E-01	7.00E-02	4.08E-01	1.23E-01	3.38E-01
Zn-65	*	--	8.00E-02	5.00E-02	< 3.20E-02	3.60E-02	< -9.80E-02	5.00E-02	-7.07E-02	4.70E-02	6.69E-02
Zr-95	*	--	--	--	< -4.80E-04	3.10E-02	3.50E-02	2.90E-02	2.48E-02	4.96E-02	1.98E-02

Table A-2.1. Results of Grid Soil Sampling (pCi/g)
Location 2E23

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	--	--	--	--	< 2.00E-02	5.10E-02	--	--	--	--	2.00E-02
Ce-144	--	--	--	--	< -1.10E-01	1.80E-01	1.80E-01	1.40E-01	--	--	3.50E-02
Co-58	*	--	--	--	< -2.70E-03	1.90E-02	< -2.20E-02	1.80E-02	--	--	1.24E-02
Co-60	*	--	3.00E-02	2.00E-02	2.90E-02	2.00E-02	< 1.40E-02	2.10E-02	--	--	2.43E-02
Cs-134	*	--	6.00E-02	4.00E-02	< 1.70E-02	2.60E-02	< -7.90E-02	2.90E-02	--	--	4.20E-02
Cs-137	9.29E+00	6.08E-01	9.98E+00	1.02E+00	1.10E+01	1.10E+00	9.60E+00	9.80E-01	--	--	9.97E+00
Eu-152	1.25E-01	1.16E-01	2.30E-01	1.00E-01	< 6.90E-02	8.60E-02	1.60E-01	9.60E-02	--	--	1.46E-01
Eu-154	*	--	--	--	< 4.80E-02	6.80E-02	< 3.00E-02	6.80E-02	--	--	3.90E-02
Eu-155	*	--	1.90E-01	1.60E-01	1.50E-01	1.00E-01	< 3.10E-02	8.20E-02	--	--	1.24E-01
I-129	--	--	--	--	--	--	--	--	--	--	--
K-40	--	--	--	--	--	--	--	--	--	--	--
Mn-54	2.10E-02	2.00E-02	--	--	< 1.70E-03	2.10E-02	< 1.40E-02	2.10E-02	--	--	1.22E-02
Nb-95	*	--	--	--	--	--	--	--	--	--	--
Pb-212	--	--	--	--	--	--	--	--	--	--	--
Pb-214	--	--	--	--	--	--	6.80E-01	1.10E-01	--	--	6.80E-01
Pu-238	5.30E-03	1.20E-03	4.00E-03	1.40E-03	1.50E-01	1.50E-02	5.00E-03	1.40E-03	--	--	4.11E-02
Pu-239	1.84E-01	1.80E-02	1.20E-01	1.60E-02	3.90E-02	4.70E-03	1.60E-01	1.90E-02	--	--	1.26E-01
Ru-106	*	--	--	--	< 1.40E-01	2.40E-01	< 1.10E-02	2.40E-01	--	--	7.55E-02
Sr-90	2.34E+00	4.25E-01	4.47E+00	8.50E-01	1.60E+00	3.90E-01	1.10E-01	2.50E-02	--	--	2.20E+00
Tc-99	--	--	--	--	--	--	--	--	--	--	--
U (total)	3.00E-01	1.10E-01	5.30E-01	1.70E-01	2.90E-01	8.70E-02	2.70E-01	8.80E-02	--	--	3.48E-01
Zn-65	*	--	1.10E-01	5.00E-02	< -6.10E-02	5.70E-02	< -1.10E-01	5.80E-02	--	--	9.37E-02
Zr-95	*	--	9.00E-02	6.00E-02	< 3.20E-02	3.70E-02	< 1.20E-02	3.60E-02	--	--	4.47E-02

Table A-2.1. Results of Grid Soil Sampling (pCi/g)
Location 2E24

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	--	--	--	--	< 2.20E-02	3.60E-02	--	--	2.97E-02	1.17E-01	2.59E-02
Ce-144	--	--	--	--	< -5.00E-02	1.20E-01	< 7.60E-02	1.50E-01	-1.94E-02	1.44E-01	2.20E-03
Co-58	*	--	--	--	< -8.10E-03	1.60E-02	< -4.60E-03	1.80E-02	2.87E-03	2.43E-02	1.19E-03
Co-60	*	--	--	--	< 9.00E-03	1.10E-02	< 8.60E-03	1.70E-02	3.09E-03	1.71E-02	6.90E-03
Cs-134	1.18E-01	3.60E-02	5.00E-02	4.00E-02	3.50E-02	1.90E-02	< -1.20E-02	2.00E-02	6.50E-03	1.52E-02	3.95E-02
Cs-137	4.94E+00	3.48E-01	8.95+00	9.20E-01	6.80E+00	6.90E-01	5.80E+00	5.90E-01	9.68E-01	1.12E-01	5.49E+00
Eu-152	2.31E-01	1.48E-01	1.60E-01	1.20E-01	1.00E-01	6.50E-02	< 6.40E-02	1.00E-01	6.49E-02	8.95E-02	1.24E-01
Eu-154	*	--	--	--	< -3.90E-02	5.20E-02	< 2.50E-02	5.60E-02	-3.89E-03	4.50E-02	2.26E-02
Eu-155	*	--	--	--	< -1.30E-02	6.90E-02	< 3.50E-02	8.00E-02	2.35E-02	8.05E-02	1.52E-02
I-129	--	--	--	--	< -3.20E-01	3.70E-01	--	--	1.74E-01	2.59E-01	2.47E-01
K-40	--	--	--	--	--	--	--	--	1.37E+01	1.60E+00	1.37E+01
Mn-54	*	--	--	--	< -3.80E-03	1.40E-02	< 1.30E-02	1.90E-02	-1.31E-02	1.83E-02	9.97E-02
Nb-95	*	--	--	--	--	--	--	--	-1.07E-01	6.58E-02	1.07E-01
Pb-212	--	--	--	--	--	--	--	--	8.55E-01	1.00E-01	8.55E-01
Pb-214	--	--	--	--	--	--	6.60E-01	9.90E-02	6.84E-01	9.64E-02	6.72E-01
Pu-238	5.00E-04	3.00E-04	1.10E-03	5.00E-04	4.10E-04	3.30E-04	6.20E-04	4.40E-04	7.92E-04	2.89E-04	6.84E-04
Pu-239	2.60E-02	3.00E-03	4.00E-02	5.00E-03	2.50E-02	3.20E-03	2.70E-02	4.00E-03	3.35E-02	3.75E-03	3.03E-02
Ru-106	*	--	--	--	< 1.50E-01	1.60E-01	< -1.00E-02	2.10E-01	-8.61E-02	1.68E-01	1.80E-02
Sr-90	1.28E+00	2.38E-01	1.27E+00	2.30E-01	1.20E+00	3.00E-01	< 1.80E-03	5.70E-03	2.19E-01	4.37E-02	7.94E-01
Tc-99	--	--	--	--	< 7.60E-03	7.70E-01	--	--	3.25E-01	1.07E+00	1.66E-01
U (total)	3.42E-01	1.13E-01	4.60E-01	1.50E-01	2.10E-01	6.40E-02	3.20E-01	1.00E-01	3.27E-01	1.02E-01	3.32E-01
Zn-65	*	--	--	--	< -2.20E-02	4.00E-02	< -3.50E-02	4.60E-02	-1.72E-02	4.08E-02	2.47E-02
Zr-95	*	--	--	--	4.10E-02	2.70E-02	< -1.80E-03	3.50E-02	2.01E-02	5.19E-02	1.98E-02

Table A-2.1. Results of Grid Soil Sampling (pCi/g)
Location 2E29

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	--	--	--	--	--	--	--	--	3.03E-02	7.97E-02	3.03E-02
Ce-144	--	--	--	--	--	--	< -1.60E-01	1.50E-01	-4.50E-02	1.02E-01	1.03E-01
Co-58	4.50E-02	4.10E-02	--	--	--	--	2.70E-02	2.20E-02	1.53E-02	2.65E-02	2.91E-02
Co-60	*	--	--	--	--	--	< 9.00E-03	1.80E-02	5.42E-03	1.70E-02	7.21E-03
Cs-134	6.60E-02	4.20E-02	8.00E-02	3.00E-02	--	--	< 3.00E-03	2.20E-02	-7.63E-03	1.69E-02	3.53E-02
Cs-137	2.98E+00	2.31E-01	2.37E+00	2.50E-01	--	--	3.20E+00	3.40E-01	1.93E+00	2.07E-01	2.62E+00
Eu-152	*	--	1.50E-01	8.00E-02	--	--	< -2.20E-03	1.20E-01	5.63E-02	6.98E-02	6.80E-02
Eu-154	*	--	--	--	--	--	< 9.50E-03	7.30E-02	3.97E-03	5.14E-02	6.74E-03
Eu-155	*	--	--	--	--	--	< 2.80E-02	8.30E-02	1.43E-02	5.52E-02	2.12E-02
I-129	--	--	--	--	--	--	--	--	1.74E-01	3.09E-01	1.74E-01
K-40	--	--	--	--	--	--	--	--	1.54E+01	1.74E+00	1.54E+01
Mn-54	*	--	--	--	--	--	< 4.50E-04	2.10E-02	-1.01E-02	1.96E-02	5.28E-03
Nb-95	1.23E-01	6.20E-02	--	--	--	--	--	--	-3.27E-02	7.08E-02	4.52E-02
Pb-212	--	--	--	--	--	--	--	--	8.75E-01	1.01E-01	8.75E-01
Pb-214	--	--	--	--	--	--	7.60E-01	1.10E-01	6.67E-01	9.09E-02	7.14E-01
Pu-238	2.40E-03	7.00E-04	1.80E-03	1.00E-03	--	--	1.90E-03	5.60E-04	1.24E-03	3.70E-04	1.84E-03
Pu-239	7.70E-02	8.00E-03	4.60E-02	7.00E-03	--	--	6.80E-02	7.80E-03	5.06E-02	5.48E-03	6.04E-02
Ru-106	*	--	4.00E-01	2.20E-01	--	--	< 1.40E-01	2.20E-01	1.30E-01	1.79E-01	2.23E-01
Sr-90	1.19E+00	3.51E-01	4.20E-01	8.00E-02	--	--	4.80E-01	8.80E-02	3.32E-01	6.28E-02	7.86E-01
Tc-99	--	--	--	--	--	--	--	--	2.24E-01	1.06E+00	2.24E-01
U (total)	3.99E-01	1.29E-01	5.90E-01	2.00E-01	--	--	3.20E-01	1.00E-01	4.82E-01	1.42E-01	4.48E-01
Zn-65	*	--	--	--	--	--	< -1.60E-02	5.80E-02	-1.87E-02	4.41E-02	1.74E-02
Zr-95	9.60E-02	7.90E-02	--	--	--	--	< -1.00E-02	4.50E-02	-2.22E-02	5.98E-02	2.13E-02

Table A-2.1. Results of Grid Soil Sampling (pCi/g)
Location 2E30

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	--	--	--	--	< -1.90E-02	2.80E-02	--	--	-4.98E-02	7.60E-02	3.44E-02
Ce-144	--	--	--	--	< 2.40E-02	9.60E-02	< 8.30E-03	1.20E-01	-4.86E-02	9.92E-02	2.70E-02
Co-58	*	--	--	--	< -7.30E-03	1.50E-02	< -5.10E-03	1.80E-02	3.24E-04	2.47E-02	4.24E-03
Co-60	*	--	--	--	< 5.00E-03	1.70E-02	< 3.00E-03	2.00E-02	-1.84E-03	1.45E-02	2.05E-03
Cs-134	*	--	--	--	4.70E-02	1.80E-02	< 1.40E-02	1.60E-02	-7.36E-02	1.93E-02	4.49E-02
Cs-137	2.33E-01	4.20E-02	--	--	2.20E-01	3.30E-02	3.20E-01	4.60E-02	3.41E-01	4.66E-02	2.79E-01
Eu-152	*	--	--	--	< 5.70E-02	6.20E-02	< 2.10E-02	9.90E-02	9.74E-02	7.13E-02	5.85E-02
Eu-154	*	--	--	--	< 4.30E-02	4.90E-02	< 3.10E-02	4.80E-02	-4.69E-02	5.44E-02	9.03E-03
Eu-155	*	--	--	--	< 3.80E-02	5.50E-02	< 2.80E-02	7.50E-02	7.85E-02	5.03E-02	4.82E-02
I-129	--	--	--	--	--	--	--	--	6.30E-02	4.65E-01	6.30E-02
K-40	--	--	--	--	--	--	--	--	1.35E+01	1.51E+00	1.35E+01
Mn-54	3.10E-02	2.30E-02	--	--	< -1.30E-02	1.80E-02	< 2.30E-03	1.80E-02	-4.48E-03	1.70E-02	3.96E-03
Nb-95	*	--	--	--	--	--	--	--	-1.14E-02	6.82E-02	1.14E-02
Pb-212	--	--	--	--	--	--	--	--	7.04E-01	8.07E-02	7.04E-01
Pb-214	--	--	--	--	--	--	6.50E-01	8.90E-02	6.02E-01	7.97E-02	6.26E-01
Pu-238	7.00E-04	4.00E-04	--	--	5.90E-04	2.70E-04	5.40E-04	2.40E-04	2.68E-03	5.62E-04	1.13E-03
Pu-239	1.90E-02	3.00E-03	--	--	1.70E-02	2.10E-03	1.80E-02	2.30E-03	3.53E-02	3.89E-03	2.23E-02
Ru-106	*	--	--	--	5.00E-01	1.70E-01	3.20E-01	1.70E-01	3.28E-01	1.52E-01	3.83E-01
Sr-90	6.48E-01	1.23E-01	--	--	2.00E-01	5.00E-02	4.20E-01	7.70E-02	2.03E-01	4.31E-02	3.68E-01
Tc-99	--	--	--	--	--	--	--	--	1.66E-01	1.05E+00	1.66E-01
U (total)	4.50E-01	1.45E-01	--	--	5.10E-02	2.30E-02	1.70E-01	5.90E-02	5.56E-01	1.62E-01	3.07E-01
Zn-65	*	--	--	--	< 6.20E-03	3.30E-02	4.30E-02	4.00E-02	-9.23E-02	5.26E-02	1.44E-02
Zr-95	*	--	--	--	< 3.50E-03	3.10E-02	< 2.00E-02	3.30E-02	3.36E-02	5.22E-02	1.90E-02

Table A-2.1. Results of Grid Soil Sampling (pCi/g)
Location 2ED

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	--	--	--	--	3.80E-02	3.30E-02	--	--	-2.74E-02	8.64E-02	5.30E-03
Ce-144	--	--	--	--	< -1.50E-02	1.10E-01	< 3.70E-02	9.70E-02	-5.57E-02	1.06E-01	3.59E-02
Co-58	*	--	--	--	< 8.70E-03	1.70E-02	< -1.00E-02	1.40E-02	2.44E-02	2.57E-02	7.70E-03
Co-60	*	--	--	--	2.50E-02	1.50E-02	< -7.10E-03	1.70E-02	-8.91E-03	1.56E-02	3.00E-03
Cs-134	7.30E-02	2.20E-02	6.00E-02	3.00E-02	4.30E-02	2.20E-02	< -5.60E-03	1.50E-02	1.29E-03	1.40E-02	3.43E-02
Cs-137	8.15E+00	5.10E-01	2.33E+00	2.50E-01	2.80E+00	2.90E-01	3.40E+00	3.50E-01	2.42E+00	2.53E-01	3.82E+00
Eu-152	*	--	1.10E-01	8.00E-02	< 5.50E-02	7.80E-02	1.30E-01	8.50E-02	1.29E-01	7.95E-02	1.06E-01
Eu-154	*	--	--	--	8.40E-02	4.70E-02	< -2.50E-02	5.50E-02	3.94E-02	5.77E-02	3.28E-02
Eu-155	*	--	9.00E-02	7.00E-02	< 6.00E-02	6.20E-02	< 4.60E-02	5.30E-02	6.19E-02	5.08E-02	6.45E-02
I-129	--	--	--	--	5.60E-01	3.20E-01	--	--	-2.52E-01	5.34E-01	1.54E-01
K-40	--	--	--	--	--	--	--	--	1.63E+01	1.79E+00	1.63E+01
Mn-54	*	--	--	--	1.80E-02	1.50E-02	2.40E-02	1.70E-02	-1.50E-02	1.83E-02	9.00E-03
Nb-95	*	--	--	--	--	--	--	--	-6.84E-02	7.10E-02	6.84E-02
Pb-212	--	--	--	--	--	--	--	--	7.70E-01	8.71E-02	7.70E-01
Pb-214	--	--	--	--	--	--	6.90E-01	9.00E-02	6.76E-01	8.82E-02	6.83E-01
Pu-238	2.50E-03	7.00E-04	5.00E-04	3.00E-04	6.50E-04	2.90E-04	9.00E-04	3.10E-04	1.60E-04	1.35E-04	9.42E-04
Pu-239	7.10E-02	7.00E-03	3.10E-02	4.00E-03	4.50E-02	5.10E-03	3.90E-02	4.30E-03	1.80E-02	2.24E-03	4.08E-02
Ru-106	*	--	--	--	< 2.70E-02	1.50E-01	< 6.40E-02	1.50E-01	7.01E-02	1.48E-01	5.37E-02
Sr-90	1.83E+00	3.40E-01	7.20E-01	1.40E-01	7.00E-01	1.70E-01	8.00E-01	1.50E-01	4.51E-01	9.42E-02	9.00E-01
Tc-99	--	--	--	--	< 2.20E-02	9.80E-01	--	--	2.30E-01	1.03E+00	1.26E-01
U (total)	5.16E-01	1.63E-01	9.50E-01	3.10E-01	3.40E-01	9.80E-02	3.20E-01	1.00E-01	3.56E-01	1.09E-01	4.96E-01
Zn-65	*	--	--	--	4.60E-02	3.80E-02	< -1.60E-01	5.30E-02	-8.64E-02	4.89E-02	9.75E-02
Zr-95	*	--	--	--	< 2.20E-02	3.40E-02	< -1.60E-02	2.80E-02	3.73E-02	5.25E-02	1.44E-02

Table A-2.1. Results of Grid Soil Sampling (pCi/g)
Location 2EDB

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	--	--	--	--	< 1.90E-02	3.10E-02	--	--	--	--	1.90E-02
Ce-144	--	--	--	--	< 9.20E-03	1.10E-01	--	--	--	--	9.20E-03
Co-58	--	--	--	--	< 7.60E-03	1.30E-02	--	--	--	--	7.60E-03
Co-60	--	--	--	--	< 8.40E-03	1.60E-02	--	--	--	--	8.40E-03
Cs-134	--	--	--	--	6.60E-02	2.10E-02	--	--	--	--	6.60E-02
Cs-137	--	--	--	--	2.80E+00	2.90E-01	--	--	--	--	2.80E+00
Eu-152	--	--	--	--	1.50E-01	6.80E-02	--	--	--	--	1.50E-01
Eu-154	--	--	--	--	< -3.90E-02	6.10E-02	--	--	--	--	3.90E-02
Eu-155	--	--	--	--	5.80E-02	5.50E-02	--	--	--	--	5.80E-02
I-129	--	--	--	--	< 1.00E-01	3.40E-01	--	--	--	--	1.00E-01
K-40	--	--	--	--	--	--	--	--	--	--	--
Mn-54	--	--	--	--	1.70E-02	1.60E-02	--	--	--	--	1.70E-02
Nb-95	--	--	--	--	--	--	--	--	--	--	--
Pb-212	--	--	--	--	--	--	--	--	--	--	--
Pb-214	--	--	--	--	--	--	--	--	--	--	--
Pu-238	--	--	--	--	5.00E-04	2.40E-04	--	--	--	--	5.00E-04
Pu-239	--	--	--	--	4.00E-02	4.40E-03	--	--	--	--	4.00E-02
Ru-106	--	--	--	--	< 1.00E-01	1.30E-01	--	--	--	--	1.00E-01
Sr-90	--	--	--	--	6.60E-01	1.60E-01	--	--	--	--	6.60E-01
Tc-99	--	--	--	--	< 5.20E-01	1.10E+00	--	--	--	--	5.20E-01
U (total)	--	--	--	--	3.70E-01	1.10E-01	--	--	--	--	3.70E-01
Zn-65	--	--	--	--	< 4.00E-03	3.60E-02	--	--	--	--	4.00E-03
Zr-95	--	--	--	--	< -2.00E-03	3.20E-02	--	--	--	--	2.00E-03

Table A-2.1. Results of Grid Soil Sampling (pCi/g)
Location GRT1

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	--	--	--	--	< -1.50E-02	3.50E-02	--	--	-3.37E-02	8.04E-02	2.44E-02
Ce-144	--	--	--	--	< -9.30E-02	1.20E-01	< -1.40E-02	7.40E-02	-1.60E-02	1.03E-01	4.10E-02
Co-58	--	--	--	--	< -1.40E-02	1.80E-02	< 1.00E-02	1.10E-02	1.74E-02	2.47E-02	4.47E-03
Co-60	--	--	--	--	< -2.30E-02	2.00E-02	< -3.20E-03	1.30E-02	-1.09E-02	1.57E-02	1.24E-02
Cs-134	--	--	--	--	3.90E-02	2.20E-02	< -4.40E-03	1.10E-02	-4.60E-04	1.47E-02	1.14E-02
Cs-137	--	--	--	--	1.80E+00	1.90E-01	7.10E-01	7.90E-02	1.98E+00	2.09E-01	1.50E+00
Eu-152	--	--	--	--	1.30E-01	8.10E-02	< 5.80E-02	6.30E-02	1.35E-01	8.53E-02	1.08E-01
Eu-154	--	--	--	--	< -4.60E-02	6.00E-02	< -9.90E-04	4.20E-02	-1.70E-02	5.03E-02	2.13E-02
Eu-155	--	--	--	--	< 4.00E-02	5.90E-02	5.10E-02	4.20E-02	4.48E-02	5.03E-02	4.53E-02
I-129	--	--	--	--	< -1.40E-01	3.40E-01	3.30E-01	2.80E-01	-1.75E-01	5.51E-01	5.00E-03
K-40	--	--	--	--	--	--	--	--	1.45E+01	1.62E+00	1.45E+01
Mn-54	--	--	--	--	3.90E-02	1.60E-02	< 4.20E-03	1.30E-02	2.05E-02	1.82E-02	2.12E-02
Nb-95	--	--	--	--	--	--	--	--	-5.28E-02	7.16E-02	5.28E-02
Pb-212	--	--	--	--	--	--	--	--	7.63E-01	8.72E-02	7.63E-01
Pb-214	--	--	--	--	--	--	5.80E-01	7.30E-02	5.97E-01	8.27E-02	5.89E-01
Pu-238	--	--	--	--	3.90E-04	2.50E-04	< 1.40E-04	2.20E-04	5.34E-04	2.31E-04	3.55E-04
Pu-239	--	--	--	--	1.70E-02	2.20E-03	7.30E-03	1.80E-03	2.00E-02	2.38E-03	1.48E-02
Ru-106	--	--	--	--	< -1.80E-01	1.70E-01	< -4.00E-02	1.00E-01	-1.26E-02	1.48E-01	7.75E-02
Sr-90	--	--	--	--	4.40E-01	1.10E-01	3.00E-01	5.80E-02	3.65E-01	7.02E-02	3.68E-01
Tc-99	--	--	--	--	< 5.20E-01	8.60E-01	--	--	4.92E-02	1.16E+00	2.85E-01
U (total)	--	--	--	--	2.20E-01	6.90E-02	--	--	4.42E-01	1.33E-01	3.31E-01
Zn-65	--	--	--	--	4.80E-02	3.90E-02	< -1.70E-02	2.80E-02	-5.70E-02	4.55E-02	4.07E-02
Zr-95	--	--	--	--	4.10E-02	3.70E-02	< -8.70E-03	2.20E-02	2.57E-02	5.11E-02	1.93E-02

Table A-2.1. Results of Grid Soil Sampling (pCi/g)
Location GRT2

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	--	--	--	--	< -1.50E-02	4.40E-02	--	--	2.47E-02	9.40E-02	4.85E-03
Ce-144	--	--	--	--	< -2.50E-02	1.40E-01	< -1.50E-02	9.90E-02	2.08E-03	1.12E-01	1.40E-02
Co-58	--	--	--	--	< -7.10E-03	1.80E-02	< -1.10E-03	1.40E-02	1.84E-02	2.58E-02	3.40E-03
Co-60	--	--	--	--	1.80E-02	1.70E-02	< -7.40E-03	1.50E-02	-1.43E-02	1.87E-02	1.32E-02
Cs-134	--	--	--	--	3.20E-02	2.40E-02	< 3.40E-03	1.40E-02	-5.30E-02	2.07E-02	2.95E-02
Cs-137	--	--	--	--	2.30E+00	2.40E-01	2.30E+00	2.40E-01	1.19E+00	1.31E-01	1.93E+00
Eu-152	--	--	--	--	9.20E-02	8.60E-02	< 7.60E-02	7.60E-02	-2.45E-02	8.30E-02	4.78E-02
Eu-154	--	--	--	--	< 2.30E-02	5.70E-02	< -3.00E-02	5.30E-02	4.84E-02	6.34E-02	1.38E-02
Eu-155	--	--	--	--	< -6.70E-03	8.40E-02	7.30E-02	5.80E-02	3.09E-02	5.60E-02	3.24E-02
I-129	--	--	--	--	< 1.80E-01	3.30E-01	< 1.60E-02	3.40E-01	9.59E-02	4.68E-01	9.73E-02
K-40	--	--	--	--	--	--	--	--	1.42E+01	1.60E+00	1.42E+01
Mn-54	--	--	--	--	< 1.10E-02	1.70E-02	< -2.20E-03	1.60E-02	-3.87E-03	1.78E-02	1.64E-03
Nb-95	--	--	--	--	--	--	--	--	-8.71E-02	7.34E-02	8.71E-02
Pb-212	--	--	--	--	--	--	--	--	8.43E-01	9.71E-02	8.43E-01
Pb-214	--	--	--	--	--	--	6.40E-01	8.40E-02	6.04E-01	8.36E-02	6.22E-01
Pu-238	--	--	--	--	7.70E-04	2.90E-04	< -1.60E-05	4.30E-04	7.33E-04	2.93E-04	4.96E-04
Pu-239	--	--	--	--	7.10E-02	7.50E-03	1.10E-02	3.10E-03	9.48E-03	1.39E-03	3.05E-02
Ru-106	--	--	--	--	< 1.20E-01	1.60E-01	< 9.40E-02	1.30E-01	5.72E-02	1.69E-01	9.04E-02
Sr-90	--	--	--	--	3.90E-01	1.00E-01	4.80E-01	9.40E-02	1.83E-01	3.52E-02	3.51E-01
Tc-99	--	--	--	--	< 5.30E-01	1.10E+00	--	--	2.47E-01	1.17E+00	3.89E-01
U (total)	--	--	--	--	3.20E-01	9.40E-02	--	--	4.51E-01	1.34E-01	3.86E-01
Zn-65	--	--	--	--	8.20E-02	3.90E-02	< -1.80E-02	4.10E-02	-1.60E-01	6.10E-02	8.67E-02
Zr-95	--	--	--	--	< -3.10E-02	4.10E-02	3.00E-02	2.80E-02	4.95E-02	6.43E-02	1.62E-02

Table A-2.1. Results of Grid Soil Sampling (pCi/g)
Location GRT4

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	--	--	--	--	< -3.40E-02	4.40E-02	--	--	2.24E-02	7.90E-02	2.82E-02
Ce-144	--	--	--	--	< -2.30E-02	1.30E-01	< -4.00E-03	8.50E-02	2.49E-02	9.69E-02	1.73E-02
Co-58	--	--	--	--	< -3.10E-03	1.80E-02	< 9.30E-03	1.40E-02	1.10E-02	2.53E-02	5.73E-03
Co-60	--	--	--	--	< -2.30E-02	2.00E-02	< -4.30E-03	1.40E-02	-2.82E-02	1.82E-02	1.85E-02
Cs-134	--	--	--	--	6.50E-02	2.40E-02	< -7.30E-03	1.40E-02	-8.10E-02	1.97E-02	5.11E-02
Cs-137	--	--	--	--	1.30E+00	1.40E-01	1.20E+00	1.30E-01	5.26E-01	6.43E-02	1.01E+00
Eu-152	--	--	--	--	1.10E-01	7.40E-02	1.20E-01	7.50E-02	8.71E-02	7.78E-02	1.06E-01
Eu-154	--	--	--	--	< -1.50E-02	6.30E-02	< -1.80E-02	4.40E-02	1.16E-02	5.12E-02	1.49E-02
Eu-155	--	--	--	--	< 7.50E-02	7.60E-02	6.70E-02	4.70E-02	3.24E-02	4.93E-02	5.81E-02
I-129	--	--	--	--	< -1.10E+00	6.50E-01	< -5.70E-01	5.70E-01	-9.87E-02	4.90E-01	5.90E-01
K-40	--	--	--	--	--	--	--	--	1.51E+01	1.67E+00	1.51E+01
Mn-54	--	--	--	--	2.30E-02	1.70E-02	< 1.30E-02	1.50E-02	-6.94E-03	1.84E-02	9.69E-03
Nb-95	--	--	--	--	--	--	--	--	-2.89E-02	6.53E-02	2.89E-02
Pb-212	--	--	--	--	--	--	--	--	7.91E-01	8.86E-02	7.91E-01
Pb-214	--	--	--	--	--	--	6.90E-01	8.80E-02	5.98E-01	7.77E-02	6.44E-01
Pu-238	--	--	--	--	3.40E-04	1.90E-04	< 3.30E-04	3.30E-04	6.64E-04	3.05E-04	4.45E-04
Pu-239	--	--	--	--	1.60E-02	1.90E-03	2.00E-02	3.20E-03	7.35E-03	1.24E-03	1.45E-02
Ru-106	--	--	--	--	< -2.70E-03	1.80E-01	< 5.30E-02	1.20E-01	5.74E-02	1.40E-01	3.59E-02
Sr-90	--	--	--	--	3.40E-01	8.50E-02	3.80E-01	7.20E-02	1.80E-01	3.53E-02	3.00E-01
Tc-99	--	--	--	--	< 2.40E-01	8.50E-01	--	--	4.23E-01	1.04E+00	3.32E-01
U (total)	--	--	--	--	3.10E-01	9.10E-02	--	--	3.24E-01	9.97E-02	3.17E-01
Zn-65	--	--	--	--	< 1.80E-03	4.00E-02	< -6.60E-02	4.10E-02	-9.95E-02	4.99E-02	5.58E-02
Zr-95	--	--	--	--	< 1.80E-02	3.20E-02	< -1.60E-02	2.80E-02	2.23E-02	5.46E-02	8.10E-03

Table A-2.1. Results of Grid Soil Sampling (pCi/g)
Location GRT5

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	--	--	--	--	< 7.20E-03	3.10E-02	--	--	-2.47E-02	8.02E-02	1.60E-02
Ce-144	--	--	--	--	< -6.00E-02	1.00E-01	< -1.70E-02	7.70E-02	-1.36E-03	9.95E-02	2.61E-02
Co-58	--	--	--	--	< 9.20E-04	1.70E-02	< -7.10E-03	1.20E-02	-2.34E-02	2.93E-02	1.05E-02
Co-60	--	--	--	--	< 1.20E-03	1.70E-02	< -9.30E-03	1.20E-02	1.24E-02	1.64E-02	1.43E-03
Cs-134	--	--	--	--	6.30E-02	2.00E-02	< 8.10E-04	1.20E-02	9.82E-03	1.54E-02	2.45E-02
Cs-137	--	--	--	--	1.20E+00	1.30E-01	1.30E+00	1.30E-01	2.33E+00	2.44E-01	1.61E+00
Eu-152	--	--	--	--	9.30E-02	7.20E-02	< 4.60E-02	6.40E-02	4.24E-02	7.41E-02	6.05E-02
Eu-154	--	--	--	--	< 2.10E-02	5.90E-02	< 5.90E-03	4.10E-02	-4.09E-02	5.44E-02	2.26E-02
Eu-155	--	--	--	--	< 2.40E-02	5.60E-02	< 4.10E-02	4.30E-02	2.35E-02	5.31E-02	2.95E-02
I-129	--	--	--	--	3.60E-01	3.00E-01	< -2.60E-01	5.10E-01	-3.37E-01	5.73E-01	3.19E-01
K-40	--	--	--	--	--	--	--	--	1.48E+01	1.65E+00	1.48E+01
Mn-54	--	--	--	--	< 1.30E-02	1.50E-02	< 1.30E-03	1.40E-02	5.56E-03	1.93E-02	6.62E-03
Nb-95	--	--	--	--	--	--	--	--	-1.49E-01	7.13E-02	1.49E-01
Pb-212	--	--	--	--	--	--	--	--	7.97E-01	9.25E-02	7.97E-01
Pb-214	--	--	--	--	--	--	6.90E-01	8.50E-02	6.51E-01	8.70E-02	6.71E-01
Pu-238	--	--	--	--	2.60E-04	1.80E-04	3.90E-04	2.60E-04	3.60E-04	1.92E-04	3.37E-04
Pu-239	--	--	--	--	6.90E-03	1.00E-03	1.30E-02	2.10E-03	1.84E-02	2.23E-03	1.28E-02
Ru-106	--	--	--	--	< -2.00E-01	1.50E-01	< 5.20E-02	1.10E-01	-7.51E-03	1.67E-01	8.65E-02
Sr-90	--	--	--	--	2.20E-01	5.50E-02	3.30E-01	6.50E-02	9.76E-01	1.91E-01	5.09E-01
Tc-99	--	--	--	--	< 2.70E-01	8.50E-01	--	--	5.62E-01	1.05E+00	4.16E-01
U (total)	--	--	--	--	3.50E-01	1.00E-01	--	--	4.13E-01	1.25E-01	3.82E-01
Zn-65	--	--	--	--	< 8.40E-03	4.10E-02	< -8.20E-02	3.80E-02	-9.42E-03	5.14E-02	3.33E-02
Zr-95	--	--	--	--	< 2.10E-03	3.30E-02	< 1.50E-02	2.30E-02	0.00E+00	5.76E-02	5.70E-03

Table A-2.1. Results of Grid Soil Sampling (pCi/g)
Location GRT6

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	--	--	--	--	< -3.60E-03	3.90E-02	--	--	-5.63E-02	8.22E-02	3.00E-02
Ce-144	--	--	--	--	< -2.90E-02	1.30E-01	< 2.50E-03	9.30E-02	-5.48E-02	1.10E-01	2.88E-02
Co-58	--	--	--	--	> 8.80E-03	1.80E-02	< -4.00E-03	1.50E-02	-2.92E-02	3.34E-02	1.40E-02
Co-60	--	--	--	--	< -2.50E-03	2.10E-02	< 6.30E-03	1.40E-02	1.20E-02	1.97E-02	5.27E-03
Cs-134	--	--	--	--	3.80E-02	2.30E-02	< -4.50E-03	1.30E-02	2.19E-03	1.78E-02	1.19E-02
Cs-137	--	--	--	--	2.30E+00	2.50E-01	1.20E+00	1.30E-01	1.70E+00	1.83E-01	1.73E+00
Eu-152	--	--	--	--	< 4.60E-02	8.30E-02	< 6.90E-02	7.10E-02	5.60E-02	7.58E-02	5.70E-02
Eu-154	--	--	--	--	< 4.40E-02	5.70E-02	< 1.40E-02	4.70E-02	-9.17E-03	6.06E-02	1.63E-02
Eu-155	--	--	--	--	< 5.60E-02	7.30E-02	5.90E-02	5.30E-02	2.62E-02	5.80E-02	4.71E-02
I-129	--	--	--	--	3.90E-01	2.90E-01	4.60E-01	2.70E-01	1.11E-01	3.24E-01	3.20E-01
K-40	--	--	--	--	--	--	--	--	1.50E+01	1.71E+00	1.50E+01
Mn-54	--	--	--	--	< -7.10E-03	2.00E-02	< 6.00E-04	1.50E-02	9.42E-03	2.28E-02	9.73E-04
Nb-95	--	--	--	--	--	--	--	--	-1.38E-01	7.12E-02	1.38E-01
Pb-212	--	--	--	--	--	--	--	--	8.28E-01	9.69E-02	8.28E-01
Pb-214	--	--	--	--	--	--	5.80E-01	7.80E-02	6.68E-01	9.50E-02	6.24E-01
Pu-238	--	--	--	--	8.50E-04	3.50E-04	< -1.60E-05	1.70E-04	1.58E-04	1.44E-04	3.31E-04
Pu-239	--	--	--	--	1.60E-02	2.20E-03	5.90E-03	1.40E-03	1.02E-02	1.50E-03	1.07E-02
Ru-106	--	--	--	--	< -1.30E-02	1.50E-01	< 3.60E-02	1.20E-01	-3.91E-02	1.70E-01	2.94E-02
Sr-90	--	--	--	--	4.10E-01	1.00E-01	2.10E-01	4.10E-02	2.39E-01	4.64E-02	2.86E-01
Tc-99	--	--	--	--	< 2.50E-01	8.50E-01	--	--	3.59E-01	1.04E+00	3.05E-01
U (total)	--	--	--	--	3.50E-01	1.00E-01	--	--	4.47E-01	1.34E-01	3.99E-01
Zn-65	--	--	--	--	< 2.30E-02	4.20E-02	< -1.30E-02	3.60E-02	-2.36E-02	5.45E-02	1.99E-02
Zr-95	--	--	--	--	< 3.20E-02	3.70E-02	< 2.30E-02	2.70E-02	7.18E-02	6.10E-02	4.23E-02

NOTE: Negative values indicate concentrations at or near background levels of radioactivity.
Shaded Areas indicate a positive detection, the result is larger than the error.
Dashes indicate no data are available.
An asterisk (*) indicates that radionuclide concentration is less than detectable. The detection limits are as follows: Mn-54 = 2.0E-02, Co-58 = 2.0E-02, Co-60 = 2.0E-02, Zn-65 = 4.0E-02, Sr-90 = 5.0E-03, nb-95 = 3.0 E-02, Zr-95 = 3.0E-02, Ru-106 = 1.7E-01, Cs-134 = 2.0E-02, Cs-137 = 2.0E-02, Eu-152 = 1.1E-01, Eu-154 = 5.0E-02, Eu-155 = 5.0E-02, Pu-238 = 6.0E-04, Pu-239 = 6.0E-04, and U total = 1.0E-02.
Source: Schmidt et al. 1990; Elder et al. 1986, 1987, 1988, 1989

Table A-2.2 Results of Fenceline Soil Sampling (pCi/g)
Location 2E-1

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	–	–	–	–	<9.10E-03	2.80E-02	<1.20E-02	2.60E-02	-2.40E-02	8.26E-02	-9.67E-04
Ce-144	–	–	–	–	<2.90E-02	9.30E-02	–	–	-4.48E-04	1.06E-01	1.43E-02
Co-58	*	–	–	–	<3.40E-03	1.50E-02	–	–	0.00E+00	2.37E-02	1.70E-03
C0-60	6.10E-02	3.10E-02	–	–	<1.30E-02	1.60E-02	–	–	7.06E-04	1.45E-02	2.49E-02
Cs-134	7.00E-02	3.50E-02	3.00E-02	2.90E-02	<1.00E-02	2.00E-02	<7.30E-03	1.20E-02	-5.15E-02	1.94E-02	1.32E-02
Cs-137	3.59E+00	2.91E-01	1.31E+00	1.52E-01	1.10E+00	1.20E-01	1.50E+00	1.60E-01	4.85+00	4.94E-01	2.47E+00
Eu-152	*	–	2.35E-01	8.90E-02	1.30E-01	6.60E-02	7.60E-02	6.40E-02	4.16E-02	6.84E-02	1.21E-01
Eu-154	*	–	–	–	1.20E-01	4.50E-02	<1.10E-02	4.90E-02	-1.74E-02	4.67E-02	3.79E-02
Eu-155	*	–	–	–	<-3.70E-02	5.70E-02	<3.00E-02	5.20E-02	2.32E-02	5.69E-02	5.40E-03
I-129	–	–	–	–	–	–	–	–	–	–	–
K-40	–	–	–	–	–	–	–	–	1.32E+01	1.46E+00	1.32E+01
Mn-54	*	–	–	–	<5.80E-03	1.60E-02	<1.90E-03	1.50E-02	1.16E-02	1.64E-02	6.43E-03
Nb-95	*	–	–	–	–	–	–	–	2.00E-03	5.15E-02	2.00E-03
Pb-212	–	–	–	–	–	–	–	–	6.29E-01	7.46E-02	6.29E-01
Pb-214	–	–	–	–	–	–	–	–	4.60E-01	7.01E-02	4.60E-01
Pu-238	2.00E-04	2.00E-04	–	–	<4.40E-05	1.20E-04	<-1.60E-05	9.20E-05	–	–	7.60E-05
Pu-239	2.80E-02	3.00E-03	2.00E-03	1.00E-03	1.10E-03	4.00E-04	1.60E-03	4.80E-04	–	–	8.18E-03
Ru-106	*	–	–	–	<1.20E-01	1.30E-01	<2.20E-02	1.20E-01	4.33E-02	1.60E-01	6.18E-02
Sr-90	1.12E+00	2.50E-01	4.42E-01	8.60	3.50E-01	8.70E-02	5.20E-01	9.80E-02	–	–	6.08E-02
Tc-99	–	–	–	–	–	–	–	–	–	–	–
U (total)	2.50E-01	8.70E-02	3.60E-01	1.18E-01	3.20E-01	1.50E-01	1.30E-01	4.80E-02	–	–	2.65E-01
Zn-65	*	–	–	–	<-5.50E-02	4.20E-02	–	–	-1.13E-01	4.97E-02	-8.40E-02
Zr-95	*	–	–	–	<-7.90E-03	3.00E-02	<-8.70E-03	2.60E-02	-3.56E-03	4.43E-02	-6.72E-03

Table A-2.2 Results of Fenceline Soil Sampling (pCi/g)
Location 2E-2

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989	1989	Average Result
Ce-141	–	–	–	–	<-3.10E-02	5.90E-02	<2.20E-03	3.70E-03	5.23E-02	8.72E-02	7.83E-03
Ce-144	–	–	–	–	<8.20E-02	2.00E-01	–	–	-4.45E-02	1.17E-01	1.88E-02
Co-58	*	–	–	–	<3.10E-04	1.70E-02	–	–	-1.22E-02	2.17E-02	-5.95E-03
C0-60	*	–	–	–	<-7.60E-03	1.60E-02	–	–	-1.20E-03	1.58E-02	-4.40E-03
Cs-134	*	–	–	–	7.50E-02	2.10E-02	<1.80E-02	1.90E-02	-4.95E-03	1.76E-02	2.94E-02
Cs-137	2.10E+01	1.35E+00	2.12E+01	2.15E+00	2.50E+01	2.50E+00	1.50E+01	1.50E+00	7.66E+00	7.76E-01	1.80E+01
Eu-152	*	–	1.67E-01	1.06E-01	<5.60E-02	7.40E-02	8.50E-02	8.10E-02	6.20E-02	6.74E-02	9.25E-02
Eu-154	*	–	–	–	<5.00E-02	5.30E-02	<-6.50E-04	4.80E-02	6.12E-02	4.40E-02	3.69E-02
Eu-155	*	–	–	–	<8.70E-02	1.20E-01	<5.40E-02	7.50E-02	3.61E-03	5.73E-02	4.82E-02
I-129	–	–	–	–	–	–	–	–	–	–	–
K-40	–	–	–	–	–	–	–	–	1.36E+01	152E+00	1.36E+01
Mn-54	*	–	–	–	<8.40E-03	1.60E-02	<7.70E-03	1.40E-02	1.56E-02	1.61E-02	1.06E-02
Nb-95	*	–	–	–	–	–	–	–	-1.64E-02	4.46E-02	-1.64E-02
Pb-212	–	–	–	–	–	–	–	–	6.13E-01	7.50E-02	6.13E-01
Pb-214	–	–	–	–	–	–	–	–	4.69E-01	7.60E-02	4.69E-01
Pu-238	5.00E-04	3.00E-04	–	–	<2.70E-04	4.00E-04	<-3.20E-05	3.30E-04	–	–	2.46E-04
Pu-239	8.00E-03	2.00E-03	7.00E-03	2.00E-03	7.30E-03	1.70E-03	4.30E-03	1.50E-03	–	–	6.65E-03
Ru-106	*	–	1.88E-01	4.45E-01	<2.30E-01	2.50E-01	<1.20E-01	2.00E-01	3.73E-02	1.71E-01	2.16E-01
Sr-90	2.67E+00	4.95E-01	2.35E+00	4.28E-01	2.60E+00	6.60E-01	2.10E+00	3.90E-01	–	–	2.43E+00
Tc-99	–	–	–	–	–	–	–	–	–	–	–
U (total)	3.08E-01	1.03E-01	2.87E-01	9.50E-02	3.90E-01	1.80E-01	3.30E-01	1.00E-01	–	–	3.29E-01
Zn-65	*	–	1.09E-01	6.20E-02	<1.60E-02	4.00E-02	–	–	-3.69E-02	4.26E-02	2.94E-02
Zr-95	*	–	–	–	<-2.40E-02	3.20E-02	<6.80E-03	2.50E-02	-2.52E-02	4.19E-02	-1.41E-02

Table A-2.2 Results of Fenceline Soil Sampling (pCi/g)
Location 2E-3

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Result
Ce-141	–	–	–	–	<-8.70E-03	2.90E-02	<7.50E-03	2.60E-02	-1.94E-02	6.85E-02	-6.87E-03
Ce-144	–	–	–	–	<-9.30E-02	9.80E-02	–	–	-7.68E-02	8.80E-02	-8.49E-02
Co-58	*	–	–	–	<7.80E-03	1.60E-02	–	–	-8.49E-03	2.53E-02	-3.45E-04
C0-60	*	–	–	–	<6.40E-03	1.60E-02	–	–	5.46E-03	1.51E-02	5.93E-03
Cs-134	9.60E-02	6.40E-02	–	–	4.90E-02	2.40E-02	2.50E-02	1.40E-02	-4.99E-03	1.39E-02	4.13E-02
Cs-137	6.00E-01	1.17E-01	2.23E-01	4.60E-02	4.90E-01	6.40E-02	7.80E-01	8.90E-02	2.90E-01	3.94E-02	4.77E-01
Eu-152	*	–	1.41E-01	9.40E-02	1.00E-01	6.10E-02	7.20E-02	5.70E-02	1.28E-01	7.51E-02	1.10E-01
Eu-154	*	–	–	–	<7.40E-03	5.20E-02	<1.80E-02	4.40E-02	-3.33E-04	5.06E-02	8.36E-03
Eu-155	*	–	–	–	<-4.00E-03	5.90E-02	5.50E-02	5.30E-02	5.17E-02	4.59E-02	3.42E-03
I-129	–	–	–	–	–	–	–	–	–	–	–
K-40	–	–	–	–	–	–	–	–	1.43+01	1.58E+00	1.43E+01
Mn-54	*	–	–	–	2.30E-02	1.70E-02	<9.30E-03	1.50E-02	5.33E-03	1.66E-02	1.25E-02
Nb-95	*	–	–	–	–	–	–	–	-4.15E-02	5.45E-02	-4.15E-02
Pb-212	–	–	–	–	–	–	–	–	6.61E-01	7.65E-02	6.61E-01
Pb-214	–	–	–	–	–	–	–	–	5.28E-01	7.05E-02	5.28E-01
Pu-238	4.00E-04	3.00E-04	4.00E-04	3.00E-04	3.90E-04	2.40E-04	3.50E-04	1.90E-04	–	–	3.85E-04
Pu-239	4.20E-02	5.00E-03	1.00E-02	2.00E-03	1.00E-02	1.60E-03	1.30E-02	1.70E-03	–	–	1.88E-02
Ru-106	9.89E-01	6.89E-01	2.22E-01	2.19E-01	4.40E-01	1.80E-01	2.30E-01	1.40E-01	2.11E-02	1.48E-01	3.80E-01
Sr-90	1.00E+00	1.87E-01	3.06E-01	6.20E-02	5.70E-01	1.40E-01	2.50E-01	4.80E-02	–	–	5.32E-01
Tc-99	–	–	–	–	–	–	–	–	–	–	–
U (total)	2.67E-01	9.20E-02	3.97E-01	1.29E-01	2.40E-01	1.20E-01	3.20E-01	1.00E-01	–	–	3.06E-01
Zn-65	*	–	–	–	<3.30E-02	3.60E-02	–	–	-1.60E-02	–	8.50E-03
Zr-95	*	–	–	–	<2.60E-02	3.10E-02	<-1.60E-02	2.80E-02	2.03E-02	4.83E-02	1.01E-02

Table A-2.2 Results of Fenceline Soil Sampling (pCi/g)
Location 2E-4

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	–	–	–	–	–	–	–	–	–	–	–
Ce-144	–	–	–	–	–	–	–	–	–	–	–
Co-58	*	–	–	–	–	–	–	–	–	–	–
C0-60	*	–	–	–	–	–	–	–	–	–	–
Cs-134	8.60E+01	–	–	–	–	–	–	–	–	–	8.60E+01
Cs-137	*	–	–	–	–	–	–	–	–	–	–
Eu-152	*	–	–	–	–	–	–	–	–	–	–
Eu-154	–	–	–	–	–	–	–	–	–	–	–
Eu-155	–	–	–	–	–	–	–	–	–	–	–
I-129	–	–	–	–	–	–	–	–	–	–	–
K-40	–	–	–	–	–	–	–	–	–	–	–
Mn-54	*	–	–	–	–	–	–	–	–	–	–
Nb-95	*	–	–	–	–	–	–	–	–	–	–
Pb-212	–	–	–	–	–	–	–	–	–	–	–
Pb-214	–	–	–	–	–	–	–	–	–	–	–
Pu-238	*	–	–	–	–	–	–	–	–	–	–
Pu-239	2.30E+02	–	–	–	–	–	–	–	–	–	2.30E+02
Ru-106	*	–	–	–	–	–	–	–	–	–	–
Sr-90	7.80E+00	–	–	–	–	–	–	–	–	–	7.80E+00
Tc-99	–	–	–	–	–	–	–	–	–	–	–
U (total)	*	–	–	–	–	–	–	–	–	–	–
Zn-65	*	–	–	–	–	–	–	–	–	–	–
Zr-95	*	–	–	–	–	–	–	–	–	–	–

Table A-2.2 Results of Fenceline Soil Sampling (pCi/g)
Location 2E-NE

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Result
Ce-141	–	–	–	–	<1.80E-02	2.80E-02	<-2.00E-03	3.10E-02	-3.88E-102	7.66E-02	-7.60E-03
Ce-144	–	–	–	–	<-6.40E-02	1.00E-01	–	–	1.67E-02	1.10E-01	-2.37E-02
Co-58	*	–	–	–	<-1.00E-02	1.80E-02	–	–	-9.15E-03	2.69E-02	-9.58E-03
C0-60	*	–	–	–	<1.20E-02	1.50E-02	–	–	8.39E-03	1.60E-02	1.02E-02
Cs-134	9.40E-02	5.60E-02	9.80E-02	3.40E-02	3.20E-02	2.00E-02	<-3.00-03	2.10E-02	-2.16E-03	1.55E-02	4.38E-02
Cs-137	5.10E-01	1.83E-01	1.54E+00	1.75E-01	1.10E+00	1.20E-01	1.70E+00	1.90E-01	1.08+00	1.20E-01	1.19E+00
Eu-152	*	–	–	–	<-2.00E-03	8.10E-02	<8.00E-02	9.60E-02	1.71E-02	8.30E-02	3.17E-02
Eu-154	*	–	–	–	<3.90E-02	4.40E-02	<1.80E-02	6.60E-02	1.21E-03	5.78E-02	1.94E-02
Eu-155	*	–	–	–	<4.40E-02	5.30E-02	<6.80E-02	7.30E-02	2.00E-02	4.83E-02	4.30E-02
I-129	–	–	–	–	–	–	–	–	–	–	–
K-40	–	–	–	–	–	–	–	–	1.38E+01	1.57E+00	1.38E+01
Mn-54	6.70E-02	4.90E-02	2.90E-02	2.40E-02	<-1.10E-02	1.80E-02	<1.60E-02	1.90E-02	1.72E-02	1.93E-02	2.36E-02
Nb-95	*	–	–	–	–	–	–	–	-4.63E-02	6.43E-02	-4.63E-02
Pb-212	–	–	–	–	–	–	–	–	7.27E-01	8.47E-02	7.27E-01
Pb-214	–	–	–	–	–	–	–	–	6.00E-01	8.36E-02	6.00E-01
Pu-238	6.00E-04	4.00E-04	–	–	<1.60E-04	1.80E-04	<2.20E-04	2.40E-04	–	–	3.27E-04
Pu-239	5.00E-03	1.00E-03	5.00E-03	1.00E-03	5.10E-03	1.00E-03	6.50E-03	1.50E-03	–	–	5.40E-03
Ru-106	*	–	–	–	<3.10E-02	1.40E-01	<-2.70E-02	2.00E-01	-2.53E-02	1.53E-01	-6.50E-03
Sr-90	1.88E+00	3.44E-01	1.46E+00	2.71E-01	1.00E+00	2.50E-01	2.20E+00	4.20E-01	–	–	1.64E+00
Tc-99	–	–	–	–	–	–	–	–	–	–	–
U (total)	2.14E-01	7.60E-02	3.54E+00	1.17E-01	1.20E-01	6.20E-02	2.30E-01	7.40E-02	–	–	2.30E-01
Zn-65	*	–	6.50E-02	4.80E-02	<-1.50E-03	3.60E-02	–	–	-2.40E-02	4.95E-02	1.43E-02
Zr-95	1.28E-01	1.03E-01	7.60E-02	7.40E-02	<-2.50E-02	2.70E-02	<2.40E-03	4.10E-02	6.48E-03	5.31E-02	3.76E-02

Table A-2.2 Results of Fenceline Soil Sampling (pCi/g)
Location 2E-SE

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Result
Ce-141	–	–	–	–	<-2.20E-02	1.80E-02	<9.30E-03	2.30E-02	1.01E-02	8.18E-02	-8.67E-04
Ce-144	–	–	–	–	<5.90E-02	6.10E-02	–	–	-8.94E-03	1.06E-01	2.50E-02
Co-58	*	–	–	–	<-6.90E-03	9.60E-03	–	–	5.69E-03	2.48E-02	-6.05E-04
C0-60	3.60E-02	2.40E-02	–	–	1.30E-02	9.70E-03	–	–	-1.79E-03	1.90E-02	1.57E-02
Cs-134	5.40E-02	4.40E-02	7.80E-02	3.40E-02	4.70E-02	1.40E-02	<-6.70E-02	1.80E-02	1.11E-03	1.46E-02	2.26E-02
Cs-137	6.30E-02	5.20W-02	1.66E-01	4.30E-02	1.20E-01	2.00E-02	1.00E-01	2.40E-02	1.34E+00	1.46E-01	3.58E-01
Eu-152	*	–	1.03E-01	9.20E-02	<4.10E-02	4.70E-02	<3.70E-02	8.10E-02	1.50E-01	7.30E-02	8.28E-02
Eu-154	*	–	–	–	<5.60E-03	3.70E-02	<-1.80E-02	5.50E-02	3.77E-02	5.39E-02	8.43E-02
Eu-155	*	–	–	–	<2.40E-02	3.30E-02	<3.60E-02	5.10E-02	6.49E-02	5.46E-02	4.16E-02
I-129	–	–	–	–	–	–	–	–	–	–	–
K-40	–	–	–	–	–	–	–	–	1.51E+01	1.68E+00	1.51E+01
Mn-54	*	–	–	–	<-9.10E-04	9.90E-03	<1.20E-02	1.50E-02	3.85E-03	1.70E-02	4.98E-03
Nb-95	*	–	–	–	–	–	–	–	-5.54E-02	6.50E-02	-5.54E-02
Pb-212	–	–	–	–	–	–	–	–	7.48E-01	8.57E-02	7.48E-01
Pb-214	–	–	–	–	–	–	–	–	6.14E-01	8.48E-02	6.14E-01
Pu-238	4.00E-04	3.00W-04	3.00E-04	3.00E-04	<-3.10E-06	8.50E-05	<1.80E-04	1.90E-04	–	–	2.19E-04
Pu-239	2.00E-03	1.00W-04	1.00E-03	1.00E-03	1.50E-03	4.20E-04	1.90E-03	5.50E-04	–	–	1.60E-04
Ru-106	*	–	2.60E-01	2.07E-01	<-3.20E-02	7.90E-02	<-2.30E-02	1.30E-01	6.05E-02	1.49E-01	6.64E-02
Sr-90	1.56+00	2.90E-01	4.83E-01	9.50E-02	3.50E-01	9.00E-02	3.80E-01	7.40E-02	–	–	6.93E-01
Tc-99	–	–	–	–	–	–	–	–	–	–	–
U (total)	3.62E-01	1.19E-01	3.14E-01	1.04E-01	2.40E-01	1.20E-01	2.90E-01	9.30E-02	–	–	3.02E-01
Zn-65	*	–	–	–	<-2.50E-02	2.90E-02	–	–	-7.47E-02	4.79E-02	-4.99E-02
Zr-95	*	–	–	–	<1.00E-02	2.00E-02	<1.20E-02	2.80E-02	2.49E-02	5.22E-02	1.56E-02

Table A-2.2 Results of Fenceline Soil Sampling (pCi/g)
Location A-TF-E1

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Result
Ce-141	–	–	–	–	<-1.60E-02	3.20E-02	<-1.10E-03	2.30E-02	-5.66E-02	9.96E-02	-2.46E-02
Ce-144	–	–	–	–	<-2.00E-02	1.10E-01	–	–	-6.39E-02	1.17E-01	-4.20E-02
Co-58	*	–	–	–	<-2.60E-03	1.70E-02	–	–	3.04E-02	2.79E-02	1.39E-02
C0-60	*	–	–	–	<-1.20E-02	1.60E-02	–	–	1.10E-02	1.92E-02	-5.00E-04
Cs-134	*	–	4.10E-02	2.90E-02	3.70E-02	2.50E-02	<-2.00E-03	1.40E-02	4.29E-03	1.88E-02	2.01E-02
Cs-137	9.60E-01	1.35E-01	2.44E+00	2.70E-01	2.10E+00	2.20E-01	3.70E+00	3.80E-01	2.79E+00	2.94E-01	2.40E+00
Eu-152	*	–	2.30E-01	1.17E-01	8.40E-02	8.20E-02	8.30E-02	6.90E-02	2.55E-02	9.47E-01	1.06E-01
Eu-154	*	–	–	–	<4.00E-02	4.80E-02	<-3.20E-02	4.60E-02	3.32E-02	5.92E-02	1.37E-02
Eu-155	*	–	–	–	<5.30E-02	6.30E-02	8.20E-02	5.50E-02	1.84E-02	5.98E-02	5.11E-02
I-129	–	–	–	–	–	–	–	–	–	–	–
K-40	–	–	–	–	–	–	–	–	1.21E+01	1.43E+00	1.21E+01
Mn-54	*	–	–	–	<3.70E-03	1.60E-02	<4.80E-04	1.30E-02	5.05E-03	1.84E-02	3.08E-03
Nb-95	*	–	–	–	–	–	–	–	-4.77E-02	7.27E-02	-4.77E-02
Pb-212	–	–	–	–	–	–	–	–	4.82E-02	6.83E-02	4.82E-01
Pb-214	–	–	–	–	–	–	–	–	5.01E-01	8.14E-02	5.01E-01
Pu-238	*	–	1.40E-03	7.00E-04	<-1.00E-05	7.70E-05	<7.50E-05	1.10E-04	–	–	4.88E-04
Pu-239	2.00E-03	1.00E-03	3.00E-03	1.00E-03	<6.10E-05	9.10E-05	3.10E-03	6.20E-04	–	–	2.04E-03
Ru-106	*	–	–	–	<1.30E-01	1.60E-01	<-1.70E-02	1.20E-01	1.49E-01	1.91E-01	8.73E-02
Sr-90	3.63E-01	7.10E-02	3.98E-01	7.90E-02	4.80E-01	1.20E-01	4.70E-01	9.10E-02	–	–	4.28E-01
Tc-99	–	–	–	–	–	–	–	–	–	–	–
U (total)	2.57E-01	8.90E-02	2.10E-01	8.70E-02	2.80E-01	1.30E-01	1.40E-01	5.00E-02	–	–	2.22E-01
Zn-65	–	–	–	–	<-5.70E-02	4.80E-02	–	–	-4.80E-02	5.29E-02	-5.25E-02
Zr-95	–	–	–	–	<3.00E-02	3.00E-02	<-5.10E-03	2.60E-02	-9.53E-03	6.06E-02	4.79E-03

Table A-2.2 Results of Fenceline Soil Sampling (pCi/g)
Location A-TF-E2

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	–	–	–	–	<7.30E-03	3.70E-02	<8.40E-04	3.00E-02	4.05E-02	9.52E-02	1.62E-02
Ce-144	–	–	–	–	<4.50E-03	1.30E-01	–	–	-4.02E-02	1.24E-01	-1.79E-02
Co-58	*	–	4.70E-02	2.50E-02	<2.80E-04	1.50E-02	–	–	1.88E-02	2.76E-02	2.20E-02
C0-60	*	–	–	–	1.80E-02	1.20E-02	–	–	-5.44E-03	1.75E-02	6.28E-03
Cs-134	*	–	4.20E-02	2.40E-02	8.00E-02	2.20E-02	2.50E-02	1.60E-02	3.42E-03	1.88E-02	3.76E-02
Cs-137	4.57E+00	3.52E-02	1.26E+01	1.28E+00	1.10E+01	1.10E+00	4.20E+00	4.40E-01	4.08+00	4.18E-01	7.29E+00
Eu-152	*	–	–	–	1.00E-01	6.30E-02	1.10E-01	6.70E-02	7.50E-02	7.45E-02	9.50E-02
Eu-154	*	–	–	–	5.10E-02	4.50E-02	<-5.20E-02	5.40E-02	-5.44E-02	5.44E-02	-1.85E-02
Eu-155	*	–	–	–	7.30E-02	6.40E-02	<3.90E-02	6.00E-02	5.23E-02	5.41E-02	5.48E-02
I-129	–	–	–	–	–	–	–	–	–	–	–
K-40	–	–	–	–	–	–	–	–	1.39E+01	1.55E+00	1.39E+01
Mn-54	6.40E-02	3.50E-02	2.20E-02	1.90E-02	<-1.50E-03	1.60E-02	<1.20E-03	1.60E-02	1.58E-02	1.90E-02	2.03E-02
Nb-95	1.11E-01	7.40E-02	–	–	–	–	–	–	-5.21E-02	6.66E-02	2.95E-02
Pb-212	–	–	–	–	–	–	–	–	6.68E-01	7.96E-02	6.68E-01
Pb-214	–	–	–	–	–	–	–	–	5.27E-01	7.55E-02	5.27E-01
Pu-238	*	–	5.00E-04	5.00E-04	9.00E-04	4.30E-04	<1.10E-04	1.90E-04	–	–	5.03E-04
Pu-239	1.00E-03	1.00E-03	4.00E-03	1.00E-03	7.60E-03	1.40E-03	3.70E-03	1.10E-03	–	–	4.08E-03
Ru-106	*	–	–	–	<-5.20E-02	1.70E-01	1.70E-01	1.50E-01	1.31E-01	1.89E-01	8.30E-02
Sr-90	1.17E+00	2.16E-01	2.41E+00	4.44E-01	4.30E+00	1.10E+00	7.20E-01	1.40E-01	–	–	2.15E+00
Tc-99	–	–	–	–	–	–	–	–	–	–	–
U (total)	2.66E-01	9.20E-02	5.52E-01	1.83E-01	3.10E-01	1.40E-01	3.20E-01	9.90E-02	–	–	3.62E-01
Zn-65	*	–	–	–	<-3.10E-02	4.00E-02	–	–	-3.27E-03	4.57E-02	-1.71E-02
Zr-95	1.43E-01	1.02E-01	–	–	<1.00E-02	2.80E-02	<1.00E-03	2.80E-02	9.31E-04	5.67E-02	3.87E-02

Table A-2.2 Results of Fenceline Soil Sampling (pCi/g)
Location 2E-1

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Result
Ce-141	–	–	–	–	<2.70E-03	3.80E-02	<2.60E+00	7.30E+00	-8.41E-02	1.11E-01	8.40E-01
Ce-144	–	–	–	–	<2.50E-02	1.30E-01	–	–	-8.47E-02	1.48E-01	-2.99E-02
Co-58	*	–	–	–	<-2.90E-03	1.30E-02	–	–	5.98E-03	2.61E-02	1.54E-03
C0-60	4.50E-02	2.60E-02	–	–	<7.00E-03	1.50E-02	–	–	-2.49E-02	1.89E-02	9.03E-03
Cs-134	5.50E-02	3.70E-02	1.19E-01	3.40E-02	8.50E-02	2.40E-02	<9.10E-03	2.20E-02	1.36E-02	2.20E-02	5.63E-02
Cs-137	5.36E+00	3.97E-01	1.51E+01	1.52E+00	1.10E+01	1.10E+01	1.30E+01	1.30E+00	7.09E+00	7.22E-01	1.03E+01
Eu-152	*	–	8.50E-02	6.90E-02	<4.60E-02	6.10E-02	<6.00E-02	7.70E-02	6.16E-02	7.50E-02	6.32E-02
Eu-154	*	–	–	–	7.10E-02	4.80E-02	<-2.10E-02	5.40E-02	4.52E-02	4.69E-02	3.17E-02
Eu-155	*	–	–	–	<1.20E-02	7.10E-02	<6.80E-02	8.30E-02	2.79E-02	8.32E-02	3.60E-02
I-129	–	–	–	–	–	–	–	–	–	–	–
K-40	–	–	–	–	–	–	–	–	1.51E+01	1.72E+00	1.51E+01
Mn-54	*	–	2.50E-02	1.60E-02	<9.00E-03	1.30E-02	<2.10E-02	2.70E-02	3.65E-02	2.84E-02	2.29E-02
Nb-95	*	–	–	–	–	–	–	–	-8.16E-02	6.65E-02	-8.16E-02
Pb-212	–	–	–	–	–	–	–	–	7.07E-01	9.03E-02	7.07E-01
Pb-214	–	–	–	–	–	–	–	–	5.00E-01	8.93E-02	5.00E-01
Pu-238	*	–	4.00E-04	4.00E-04	<-5.90E-05	1.30E-04	2.90E-04	1.60E-04	–	–	2.10E-04
Pu-239	3.00E-03	1.00E-03	3.00E-03	1.00E-03	1.40E-03	5.40E-04	4.30E-03	7.30E-04	–	–	2.93E-03
Ru-106	*	–	6.96E-01	3.30E-01	<1.40E-01	1.90E-01	<6.30E-02	2.90E-01	7.74E-02	2.40E-01	2.44E-01
Sr-90	8.32E-01	1.55E-01	5.25E+00	9.60E-01	1.60E+00	3.90E-01	2.10E+00	3.90E-01	–	–	2.45E+00
Tc-99	–	–	–	–	–	–	–	–	–	–	–
U (total)	3.25E-01	1.09E-01	2.34E-01	7.80E-02	1.70E-01	1.00E-01	2.90E-01	9.00E-02	–	–	2.55E-01
Zn-65	8.20E-02	4.80E-02	–	–	<-3.20E-02	4.00E-02	–	–	1.37E-02	4.50E-02	2.12E-02
Zr-95	*	–	–	–	<-2.10E-02	2.70E-02	<-1.70E-01	4.10E-01	-2.28E-02	5.91E-02	-7.13E-02

Table A-2.2 Results of Fenceline Soil Sampling (pCi/g)
Location A-TF-E4

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	–	–	–	–	<-5.30E-02	7.00E-02	<-4.30E-03	3.70E-02	5.17E-02	8.31E-02	-1.87E-03
Ce-144	–	–	–	–	<-8.60E-03	2.30E-01	–	–	-7.31E-03	1.07E-01	-7.96E-03
Co-58	–	–	4.60E-02	3.00E-02	<8.90E-03	1.40E-02	–	–	-5.50E-03	2.27E-02	1.65E-02
C0-60	–	–	–	–	<-9.20E-03	2.00E-02	–	–	-2.66E-03	1.36E-02	-5.93E-03
Cs-134	–	–	9.04E+01	9.06E+00	3.60E-02	2.10E-02	<-5.90E-02	2.50E-02	-8.95E-03	1.43E-02	-1.07E-02
Cs-137	–	–	–	–	4.20E+01	4.20E+00	1.00E+01	1.00E+00	4.37E+00	4.46E-01	3.67E+01
Eu-152	–	–	9.00E-02	4.90E-02	1.20E-01	6.30E-02	9.90E-02	8.00E-02	-6.92E-03	6.99E-02	7.07E-02
Eu-154	–	–	2.34E-01	1.86E-01	<2.00E-02	5.40E-02	<-8.70E-03	6.00E-02	1.15E-02	5.07E-02	2.82E-02
Eu-155	–	–	–	–	<6.10E-02	1.30E-01	<5.80E-04	8.00E-02	3.73E-02	5.26E-02	8.32E-02
I-129	–	–	–	–	–	–	–	–	–	–	–
K-40	–	–	–	–	–	–	–	–	1.29E+01	1.43E+00	1.29E+01
Mn-54	–	–	–	–	<1.10E-02	1.50E-02	<1.40E-02	1.50E-02	3.33E-03	1.53E-02	9.44E-03
Nb-95	–	–	–	–	–	–	–	–	-2.98E-02	5.57E-02	-2.98E-02
Pb-212	–	–	–	–	–	–	–	–	6.06E-01	7.17E-02	6.06E-01
Pb-214	–	–	–	–	–	–	–	–	5.25E-01	7.54E-02	5.25E-01
Pu-238	–	–	9.00E-04	5.00E-04	8.60E-04	7.60E-04	3.20E-04	1.70E-04	–	–	6.93E-04
Pu-239	–	–	1.40E-02	2.00E-03	8.20E-03	2.10E-03	8.60E-03	1.20E-03	–	–	1.03E-02
Ru-106	–	–	–	–	<-1.50E-02	3.80E-01	<1.30E-01	2.00E-01	3.67E-02	1.45E-01	5.06E-02
Sr-90	–	–	7.66E+00	1.40E+00	4.90E+00	1.20E+00	4.10E+00	7.70E-01	–	–	5.55E+00
Tc-99	–	–	–	–	–	–	–	–	–	–	-
U (total)	–	–	3.91E-01	1.27E-1	1.70E-01	1.00E-01	3.00E-01	9.50E-02	–	–	2.87E-01
Zn-65	–	–	–	–	<1.30E-02	4.60E-02	–	–	-1.71E-02	3.70E-02	-1.51E-02
Zr-95	–	–	–	–	<-1.20E-03	3.40E-02	<2.60E-02	2.80E-02	1.15E-02	4.75E-02	1.21E-02

Table A-2.2 Results of Fenceline Soil Sampling (pCi/g)
Location A-TF-W1

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Result
Ce-141	–	–	–	–	<-2.00E-02	3.70E-02	<-3.50E-02	2.70E-02	-1.20E-01	1.33E-01	-5.23E-02
Ce-144	–	–	–	–	<-7.50E-02	1.20E-01	–	–	9.25E-02	1.59E-01	8.75E-03
Co-58	*	–	–	–	2.10E-02	1.50E-02	–	–	-1.79E-02	3.96E-02	1.55E-03
C0-60	*	–	–	–	3.00E-02	1.70E-02	–	–	6.26E-03	2.16E-02	1.81E-02
Cs-134	*	–	2.90E-02	2.70E-02	7.50E-02	2.70E-02	<-5.00E-02	1.90E-02	-1.03E-02	2.24E-02	1.09E-02
Cs-137	6.76E-01	9.30E-02	2.89E+00	3.07E-01	3.70E+00	3.80E-01	1.90E+00	2.00E-01	2.02E+00	2.22E-01	2.24E+00
Eu-152	*	–	–	–	1.10E-01	7.60E-02	8.10E-02	7.10E-02	7.88E-02	1.14E-01	8.99E-02
Eu-154	1.21E-01	9.80E-02	–	–	<9.20E-03	4.70E-02	<-3.40E-02	5.40E-02	1.10E-02	7.22E-02	2.68E-02
Eu-155	*	–	–	–	<1.40E-02	7.50E-02	<2.00E-02	6.50E-02	5.74E-02	8.75E-02	3.05E-02
I-129	–	–	–	–	–	–	–	–	–	–	–
K-40	–	–	–	–	–	–	–	–	1.49E+01	1.77E+00	1.49E+01
Mn-54	*	–	–	–	<-1.50E-02	2.00E-02	2.20E-02	1.60E-02	1.22E-02	2.43E-02	6.40E-03
Nb-95	*	–	–	–	–	–	–	–	-4.25E-02	8.78E-02	-4.25E-02
Pb-212	–	–	–	–	–	–	–	–	6.41E-01	9.38E-02	6.41E-01
Pb-214	–	–	–	–	–	–	–	–	5.96E-01	9.92E-02	5.96E-01
Pu-238	*	–	–	–	<1.80E-04	2.40E-04	1.80E-04	1.40E-04	–	–	1.80E-04
Pu-239	1.00E-03	1.00E-03	3.00E-03	1.00E-03	5.10E-03	1.30E-03	3.40E-03	6.60E-04	–	–	3.13E-03
Ru-106	–	–	–	–	<-1.60E-01	1.80E-01	1.80E-01	1.40E-01	1.13E-01	2.24E-01	4.43E-02
Sr-90	6.62E-01	1.23E-01	1.02E+00	1.90E-01	1.80E+00	4.40E-01	9.50E-01	1.80E-01	–	–	1.11E+00
Tc-99	–	–	–	–	–	–	–	–	–	–	–
U (total)	2.75E-01	9.50E-02	3.18E-01	1.06E-01	2.70E-01	1.30E-01	1.90E-01	6.40E-02	–	–	2.63E-01
Zn-65	*	–	–	–	<-2.40E-02	4.10E-02	–	–	-4.76E-02	6.89E-02	-3.58E-02
Zr-95	*	–	–	–	4.40E-02	3.20E-02	<1.70E-02	2.60E-02	1.20E-02	8.00E-02	2.43E-02

Table A-2.2 Results of Fenceline Soil Sampling (pCi/g)
Location A-TF-W2

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Result
Ce-141	–	–	–	–	<1.90E-02	2.50E-02	<1.50E-03	3.90E-02	-6.55E-02	1.00E-01	-1.50E-02
Ce-144	–	–	–	–	<2.10E-02	8.40E-02	–	–	-4.79E-02	1.32E-01	-1.35E-02
Co-58	*	–	–	–	<1.70E-03	1.30E-02	–	–	-3.25E-02	3.36E-02	-1.54E-02
C0-60	*	–	–	–	<5.90E-03	1.40E-02	–	–	5.30E-03	2.17E-02	5.60E-03
Cs-134	*	–	3.50E-02	3.20E-02	2.60E-02	1.80E-02	<-1.60E-02	2.60E-02	5.47E-03	1.69E-02	1.26E-02
Cs-137	1.69E+00	1.70E-01	8.31E-01	1.09E-01	1.70E+00	1.80E-01	1.20E+01	1.20E+00	3.19E-01	4.87E-02	3.31E+00
Eu-152	*	–	–	–	<3.90E-02	6.10E-02	9.10E-02	7.20E-02	2.45E-02	9.71E-02	5.15E-02
Eu-154	*	–	–	–	<2.00E-02	4.40E-02	<3.40E-02	5.50E-02	-8.79E-02	6.81E-02	-1.13E-02
Eu-155	*	–	–	–	<4.70E-02	5.00E-02	<3.40E-02	9.20E-02	6.67E-02	7.42E-02	4.92E-02
I-129	–	–	–	–	–	–	–	–	–	–	–
K-40	–	–	–	–	–	–	–	–	1.55E+01	1.77E+00	1.55E+01
Mn-54	*	–	–	–	<2.20E-04	1.30E-02	2.40E-02	1.70E-02	3.40E-03	2.28E-02	9.21E-03
Nb-95	*	–	–	–	–	–	–	–	-1.52E-01	7.54E-02	-1.52E-01
Pb-212	–	–	–	–	–	–	–	–	9.38E-01	1.08E-01	9.38E-01
Pb-214	–	–	–	–	–	–	–	–	8.16E-01	1.06E-01	8.16E-01
Pu-238	*	–	3.00E-04	2.00E-04	<1.60E-04	2.20E-04	2.30E-04	1.50E-04	–	–	2.30E-04
Pu-239	2.00E-03	1.00E-03	1.00E-03	1.00E-03	1.30E-03	5.50E-04	3.30E-03	6.10E-04	–	–	1.90E-03
Ru-106	*	–	–	–	<-6.20E-02	1.20E-01	<3.40E-02	2.60E-01	1.74E-01	1.87E-01	4.87E-02
Sr-90	2.45E+00	4.40E-01	7.64E-01	1.45E-01	1.10E+00	2.70E-01	7.60E+00	1.40E+00	–	–	2.98E+00
Tc-99	–	–	–	–	–	–	–	–	–	–	–
U (total)	2.90E-01	9.80E-02	5.10E-01	1.67E-01	2.20E-01	1.10E-01	2.40E-01	7.80E-02	–	–	3.15E-01
Zn-65	*	–	–	–	<1.80E-02	3.50E-02	–	–	-1.02E-01	7.19E-02	-4.20E-02
Zr-95	*	–	–	–	3.30E-02	2.30E-02	<2.80E-02	3.20E-02	5.20E-02	6.63E-02	3.77E-02

Table A-2.2 Results of Fenceline Soil Sampling (pCi/g)
Location AW-TF-E

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Result
Ce-141					<2.70E-03	2.00E-02	<-2.00E-02	4.20E-02			-8.65E-03
Ce-144					<5.30E-04	6.80E-02					5.30E-04
Co-58	*				<-1.30E-02	1.40E-02					-1.30E-02
C0-60	*		3.60E-02	1.80E-02	<-1.40E-02	1.30E-02					1.10E-02
Cs-134	6.30E-02	5.30E-02	7.10E-02	2.50E-02	<4.30E-02	1.40E-02	<-2.30E-02	2.80E-02			3.85E-02
Cs-137	9.30E-02	5.00E-02	2.16E-01	4.30E-02	<3.10E-01	4.10E-02	<6.90E-01	9.50E-02			3.27E-01
Eu-152	*				<4.70E-02	5.10E-02	<-8.20E-03	1.40E-01			1.94E-02
Eu-154	*				<1.20E-02	4.10E-02	<-1.90E-02	8.30E-02			-3.50E-03
Eu-155	*				<5.80E-03	3.70E-02	<-1.30E-02	1.00E-01			-3.60E-03
I-129											
K-40											
Mn-54	5.70E-02	4.00E-02			<4.80E-03	1.10E-02	<1.10E-02	2.40E-02			2.43E-02
Nb-95	1.05E-02	7.70E-02									1.05E-01
Pb-212											
Pb-214											
Pu-238	2.20E-03	7.00E-04			<3.30E-04	2.30E-04	2.80E-04	1.70E-04			9.37E-04
Pu-239	7.10E-02	7.00E-03	1.00E-03	1.00E-03	<5.20E-03	9.80E-04	4.20E-03	7.40E-04			2.04E-02
Ru-106	4.39E-01	4.28E-01			<-6.10E-02	1.00E-01	<-1.90E-01	2.60E-01			6.27E-02
Sr-90	3.40E-02	1.90E-02	3.66E-01	7.30E-02	<1.60E-01	4.00E-02	6.10E-01	1.201E-01			2.93E-01
Tc-99											
U (total)	2072E-01	4.38E-01	4.38E-01	1.43E-01	<5.10E-01	2.80E-01	3.10E-01	9.80E-02			3.83E-01
Zn-65	*				<1.10E-02	3.10E-02					1.10E-02
Zr-95	*				<5.60E-03	1.90E-02	<-2.00E-03	5.20E-02			1.80E-03

Table A-2.2 Results of Fenceline Soil Sampling (pCi/g)
Location C-TF-NE

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Result
Ce-141	–	–	–	–	<1.00E-02	9.40E-02	<6.30E-03	3.40E-02	2.27E-02	1.65E-01	1.30E-02
Ce-144	–	–	–	–	<1.50E-01	3.20E-01	–	–	6.36E-03	2.00E-01	7.82E-02
Co-58	3.90E-02	2.40E-02	–	–	<6.30E-03	1.90E-02	–	–	-3.93E-03	3.42E-02	1.38E-02
C0-60	*	–	–	–	3.00E-02	1.60E-02	–	–	-2.50E-03	2.18E-02	1.38E-02
Cs-134	4.60E-02	4.40E-02	5.10E-02	3.30E-02	6.50E-02	2.60E-02	<1.60E-02	1.80E-02	-2.79E-02	2.92E-02	3.00E-02
Cs-137	3.25E+00	2.74E-01	4.62E+00	4.88E-01	8.20E+01	8.20E+00	1.00E+01	1.00E+00	1.75E+01	1.76E+00	2.35E+01
Eu-152	*	–	–	–	<6.80E-02	8.40E-02	<2.70E-02	6.60E-02	6.01E-02	1.04E-01	5.17E-02
Eu-154	1.35E-01	7.80E-02	1.69E-01	8.50E-02	<1.70E-02	5.20E-02	<-7.90E-03	4.50E-02	1.17E-02	6.53E-02	6.50E-02
Eu-155	*	–	–	–	<2.20E-02	1.80E-01	<6.70E-02	6.90E-02	6.78E-02	8.75E-02	5.23E-02
I-129	–	–	–	–	–	–	–	–	–	–	–
K-40	–	–	–	–	–	–	–	–	1.45E+01	1.70E+00	1.45E+01
Mn-54	*	–	–	–	<-3.30E-03	2.00E-02	<6.70E-03	1.40E-02	8.29E-03	2.38E-02	3.90E-03
Nb-95	*	–	1.88E-01	1.17E-01	–	–	–	–	-5.48E-02	9.35E-02	6.66E-02
Pb-212	–	–	–	–	–	–	–	–	7.40E-01	9.95E-02	7.40E-01
Pb-214	–	–	–	–	–	–	–	–	6.75E-01	1.17E-01	6.57E-01
Pu-238	*	–	1.00E-03	5.00E-04	<3.90E-04	6.30E-04	2.40E-04	1.60E-04	–	–	5.43E-04
Pu-239	1.00E-03	1.00E-03	3.40E-02	4.00E-03	2.20E-02	4.10E-03	1.60E-02	2.00E-03	–	–	1.83E-02
Ru-106	*	–	–	–	<-5.90E-02	5.10E-01	<5.50E-02	1.70E-01	-2.46E-01	3.14E-01	-8.33E-02
Sr-90	4.74E+00	8.75E-01	3.63E+00	6.67E-01	1.10E+01	2.60E+00	2.80E+00	5.30E-01	–	–	5.54E+00
Tc-99	–	–	–	–	–	–	–	–	–	–	–
U (total)	2.70E-01	9.30E-02	3.63E-01	1.19E-01	2.70E-01	1.30E-01	4.40E-01	1.30E-01	–	–	3.36E-01
Zn-65	7.90E-02	7.00E-02	–	–	<-7.70E-03	3.80E-02	–	–	-2.55E-02	5.45E-02	1.53E-02
Zr-95	*	–	–	–	<5.80E-03	3.30E-02	<6.70E-03	2.90E-02	-2.52E-02	7.46E-02	-4.23E-03

Table A-2.2 Results of Fenceline Soil Sampling (pCi/g)
Location C-TF-SE

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Result
Ce-141	–	–	–	–	<4.90E-03	5.40E-02	<-2.60E-02	2.80E-02	1.27E-02	2.56E-01	-2.80E-03
Ce-144	–	–	–	–	<-2.50E-02	1.90E-01	–	–	-1.32E-01	3.20E-01	-7.85E-02
Co-58	–	–	–	–	<-1.10E-02	1.70E-02	–	–	5.39E-03	3.23E-02	-2.81E-03
C0-60	–	–	–	–	2.20E-02	1.50E-02	–	–	1.91E-02	2.06E-02	2.06E-02
Cs-134	–	–	–	–	6.90E-02	2.40E-02	<-5.90E-02	2.00E-02	-5.76E-02	4.60E-02	-1.59E-02
Cs-137	–	–	3.90E+01	–	2.30E+01	2.30E+00	3.70E+00	3.80E-01	6.20E+01	6.21E+00	3.19E+01
Eu-152	–	–	–	–	9.50E-02	6.80E-02	9.60E-02	3.10E-02	3.37E-02	9.79E-02	7.49E-02
Eu-154	–	–	–	–	<-1.00E-02	6.20E-02	<1.80E-02	5.40E-02	1.52E-03	6.05E-02	3.17E-03
Eu-155	–	–	–	–	<-3.20E-02	1.00E-01	6.90E-02	6.30E-02	1.06E-01	1.53E-01	4.77E-02
I-129	–	–	–	–	–	–	–	–	–	–	–
K-40	–	–	–	–	–	–	–	–	1.56E+01	1.79E+00	1.56E+01
Mn-54	–	–	–	–	<2.00E-03	1.60E-02	<-4.30E-04	1.50E-02	4.42E-03	2.19E-02	2.00E-03
Nb-95	–	–	–	–	–	–	–	–	-8.14E-02	8.43E-02	-8.14E-02
Pb-212	–	–	–	–	–	–	–	–	6.19E-01	1.18E-01	6.19E-01
Pb-214	–	–	–	–	–	–	–	–	5.56E-01	1.39E-01	5.56E-01
Pu-238	–	–	–	–	7.50E-04	6.40E-04	7.50E-04	2.60E-04	–	–	7.50E-04
Pu-239	–	–	–	–	1.50E-02	2.90E-03	4.60E-03	7.50E-04	–	–	9.80E-03
Ru-106	–	–	–	–	<2.50E-01	2.50E-01	<2.00E-03	1.40E-01	-3.05E-01	4.58E-01	-1.77E-02
Sr-90	–	–	3.20E+01	–	1.50E+01	3.50E+00	3.40E+00	6.40E-01	–	–	1.68E+01
Tc-99	–	–	–	–	–	–	–	–	–	–	–
U (total)	–	–	–	–	2.70E-01	1.30E-01	2.40E-01	7.80E-02	–	–	2.55E-01
Zn-65	–	–	–	–	<-1.60E-02	4.00E-02	–	–	-2.20E-02	5.19E-02	-1.90E-02
Zr-95	–	–	–	–	<0.00E+00	2.80E-02	<1.50E-02	2.70E-02	7.82E-02	6.41E-02	3.11E-02

NOTE: Negative values indicate concentrations at or near background levels of radioactivity.
Dashes indicate a positive detection, the result is larger than the error.
An Asterisk (*) indicates that radionuclide concentration is less than detectable. The detection limits are as follow: Mn-54=2.0E-02, Co-58=2.0E-02, Co-60=2.0E-02, Zn-65=4.0e-02, Sr-90=5.0e-03, Nb-95=3.0E-02, Zr-95=3.0E-02, Ru-106-1.7E01, Cs-134=2.0E-02, Cs-137=2.0E-02, Eu-152=1.1E-01, Eu-154=5.0E-02, Eu-155=5.0E-02, Pu-238=6.0E-04, Pu239=6.0E-04, and U total = 1.0E-02.
Source: Schmidt et al. 1990; Elder et al. 1986, 1987, 1988, 1989.

Table A-2.3. Results of Air Monitoring for 1991 (pCi/m^3).

Radionuclide		Location N158		Location N969		Location N970		Location N972		Location N977	
		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
Be-7	Quarters 1-2	7.20E-02	4.60E-02	2.30E-02	4.80E-02	8.90E-02	4.90E-02	8.00E-02	4.10E-02	4.60E-02	5.20E-02
	Quarters 3-4	8.80E-02	2.20E-02	7.90E-02	2.00E-02	9.90E-02	2.00E-02	5.20E-02	1.60E-02	8.30E-02	2.20E-02
	Average	8.00E-02	3.40E-02	5.10E-02	3.40E-02	9.40E-02	3.50E-02	6.60E-02	2.90E-02	6.40E-02	3.70E-02
CePr-144	Quarters 1-2	-9.20E-04	2.90E-03	5.40E-04	2.80E-03	8.10E-04	2.30E-03	-2.40E-03	3.00E-03	-9.40E-04	3.30E-03
	Quarters 3-4	9.00E-04	2.20E-03	-1.10E-03	2.10E-03	1.90E-03	2.00E-03	1.40E-03	2.00E-03	-1.20E-03	2.20E-03
	Average	-1.30E-05	2.60E-03	-2.90E-04	2.70E-03	1.30E-03	2.20E-03	-5.10E-04	2.50E-03	-1.10E-03	2.70E-03
Co-60	Quarters 1-2	2.00E-04	4.80E-04	1.70E-04	3.30E-04	8.70E-05	1.20E-04	-4.70E-05	2.80E-04	-4.80E-05	2.90E-04
	Quarters 3-4	1.20E-04	2.50E-04	-9.50E-05	1.80E-04	1.20E-05	2.10E-04	-5.40E-05	2.90E-04	5.70E-05	1.50E-04
	Average	1.60E-04	3.70E-04	3.90E-05	2.60E-04	5.00E-05	1.60E-04	-5.10E-05	2.90E-04	4.40E-06	2.20E-04
Cs-134	Quarters 1-2	1.70E-04	2.70E-04	5.30E-05	2.60E-04	3.40E-05	2.70E-04	-8.30E-05	1.70E-04	-9.70E-05	2.40E-04
	Quarters 3-4	-1.10E-04	2.30E-04	-1.60E-04	1.90E-04	1.40E-04	2.00E-04	-7.00E-06	2.10E-04	-9.10E-05	2.20E-04
	Average	2.90E-05	2.50E-04	-5.20E-05	2.30E-04	8.60E-05	2.30E-04	-4.50E-05	1.90E-04	-9.40E-05	2.30E-04
Cs-137	Quarters 1-2	9.50E-04	4.30E-04	1.40E-04	2.40E-04	1.80E-04	2.30E-04	3.30E-05	2.80E-04	1.90E-04	2.20E-04
	Quarters 3-4	7.90E-04	3.50E-04	5.00E-05	2.20E-04	-5.40E-05	1.90E-04	5.40E-04	2.60E-04	6.80E-05	1.80E-04
	Average	8.70E-04	3.90E-04	9.70E-05	2.30E-04	6.20E-05	2.10E-04	2.90E-04	2.70E-04	1.30E-04	2.00E-04
Eu-154	Quarters 1-2	-4.40E-04	7.70E-04	3.50E-04	6.60E-04	-6.80E-04	1.00E-03	1.90E-04	6.30E-04	-1.30E-04	7.50E-04
	Quarters 3-4	4.60E-04	6.10E-04	7.20E-04	6.50E-04	-2.30E-04	7.30E-04	4.30E-04	5.80E-04	-3.00E-04	6.00E-04
	Average	1.10E-05	6.90E-04	5.40E-04	6.60E-04	-4.60E-04	8.70E-04	3.10E-04	6.00E-04	-2.10E-04	6.70E-04
Eu-155	Quarters 1-2	1.90E-04	3.60E-04	-9.00E-05	4.10E-04	2.50E-05	3.70E-04	-8.60E-05	6.00E-04	-3.40E-04	5.20E-04
	Quarters 3-4	6.80E-05	4.50E-04	2.80E-04	4.30E-04	2.60E-04	4.10E-04	-8.10E-06	4.90E-04	-1.50E-04	4.10E-04
	Average	1.30E-04	5.40E-04	9.30E-05	4.20E-04	1.40E-04	3.90E-04	-4.70E-05	5.40E-04	-2.50E-04	4.60E-04
K-40	Quarters 1-2	8.30E-03	4.20E-03	6.00E-03	4.20E-03	8.60E-04	3.70E-03	2.90E-03	4.10E-03	2.20E-03	3.50E-03
	Quarters 3-4	3.80E-03	3.00E-03	4.90E-03	2.30E-03	1.40E-03	3.00E-03	6.90E-03	3.80E-03	3.40E-03	2.80E-03
	Average	6.00E-03	3.60E-03	5.50E-03	3.30E-03	1.10E-03	3.30E-03	4.90E-03	3.90E-03	2.80E-03	3.10E-03

Table A-2.3. Results of Air Monitoring for 1991 (pCi/m^3).

Radionuclide		Location N158		Location N969		Location N970		Location N972		Location N977	
		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
Pu-238	Quarters 1-2	7.90E-07	9.00E-07	5.90E-07	7.90E-07	4.60E-07	7.70E-07	-8.20E-08	5.50E-07	6.40E-08	4.10E-07
	Quarters 3-4	6.60E-07	6.70E-07	1.20E-06	9.90E-07	4.00E-07	5.60E-07	3.10E-07	5.80E-07	1.60E-08	4.20E-07
	Average	7.20E-07	7.80E-07	9.00E-07	8.90E-07	4.30E-07	6.60E-06	1.10E-07	5.60E-07	4.00E-08	4.10E-07
Pu-239, 240	Quarters 1-2	3.10E-06	1.60E-06	2.60E-06	1.60E-06	3.60E-06	2.10E-06	2.30E-06	1.30E-06	1.70E-06	1.20E-06
	Quarters 3-4	3.10E-06	1.40E-06	2.40E-06	1.50E-06	1.70E-06	1.10E-06	2.50E-06	1.20E-06	3.70E-06	1.80E-06
	Average	3.10E-06	4.50E-06	2.50E-06	1.50E-06	2.70E-06	1.60E-06	2.40E-06	1.20E-06	2.70E-06	1.50E-06
Ru-106	Quarters 1-2	-1.30E-04	2.90E-03	1.10E-04	3.40E-03	-7.80E-04	3.00E-03	-1.40E-03	3.40E-03	1.90E-03	3.20E-03
	Quarters 3-4	7.40E-04	2.20E-03	0.00E+00	1.60E-03	3.70E-04	1.90E-03	6.30E-04	1.60E-03	5.00E-04	1.60E-03
	Average	3.10E-04	2.50E-03	5.30E-05	2.50E-03	-2.00E-04	2.50E-03	4.00E-04	2.50E-03	1.20E-03	2.40E-03
Sb-125	Quarters 1-2	-3.70E-04	7.10E-04	2.90E-05	5.40E-04	1.40E-04	5.90E-04	-1.70E-04	6.00E-04	-2.90E-04	6.60E-04
	Quarters 3-4	1.20E-04	6.10E-04	4.00E-04	4.90E-04	5.80E-04	4.20E-04	-2.40E-04	5.20E-04	1.30E-04	5.80E-04
	Average	-1.30E-04	6.60E-04	2.10E-04	5.20E-04	3.60E-04	5.00E-04	-2.00E-04	5.60E-04	-8.30E-05	6.20E-04
Sr-90	Quarters 1-2	2.80E-04	8.80E-05	2.30E-05	2.00E-05	1.30E-04	4.80E-05	9.70E-05	3.90E-05	2.10E-05	1.90E-05
	Quarters 3-4	2.10E-04	5.40E-05	6.20E-05	3.10E-05	1.50E-05	1.90E-05	9.00E-05	3.30E-05	3.80E-05	2.30E-05
	Average	2.40E-04	7.10E-05	4.30E-05	2.60E-05	7.30E-05	3.30E-05	9.40E-05	3.60E-05	3.00E-05	2.10E-05
U-234	Quarters 1-2	2.40E-05	6.70E-06	6.70E-06	2.80E-06	1.60E-05	3.90E-06	8.50E-06	3.90E-06	8.80E-06	3.10E-06
	Quarters 3-4	1.40E-05	3.50E-06	1.20E-05	3.00E-06	9.50E-06	2.40E-06	2.00E-05	4.00E-06	1.00E-05	3.40E-06
	Average	1.90E-05	5.10E-06	9.20E-06	2.90E-06	1.30E-05	3.10E-06	1.40E-05	4.00E-06	9.40E-06	3.20E-06
U-235	Quarters 1-2	1.70E-06	3.10E-06	6.40E-07	8.50E-07	8.60E-07	8.50E-07	-2.60E-08	7.60E-07	9.30E-07	9.20E-07
	Quarters 3-4	4.00E-07	6.60E-07	6.80E-07	7.40E-07	4.20E-07	5.40E-07	1.40E-06	9.00E-07	3.10E-07	1.00E-06
	Average	1.00E-06	1.90E-06	6.60E-07	7.90E-07	6.40E-07	7.00E-07	6.80E-07	8.30E-07	6.20E-07	9.60E-07
U-238	Quarters 1-2	2.50E-05	7.20E-06	6.30E-06	2.70E-06	1.80E-05	4.10E-06	8.70E-06	4.00E-06	7.20E-06	2.70E-06
	Quarters 3-4	1.50E-05	3.70E-06	1.20E-05	2.90E-06	8.30E-06	2.20E-06	2.50E-05	4.60E-06	8.70E-06	3.30E-06
	Average	2.00E-05	5.50E-06	9.00E-06	2.80E-06	1.30E-05	3.20E-06	1.70E-05	4.30E-06	8.00E-06	3.00E-06

Table A-2.3. Results of Air Monitoring for 1991 (pCi/m^3).

Radionuclide		Location N158		Location N969		Location N970		Location N972		Location N977	
		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
Zn-65	Quarters 1-2	2.80E-04	1.10E-03	2.40E-04	9.30E-04	1.10E-03	9.40E-04	-1.00E-03	1.30E-03	-7.30E-05	1.00E-03
	Quarters 3-4	-2.00E-04	6.90E-04	-2.20E-05	7.90E-04	-4.80E-04	5.70E-04	6.40E-04	6.40E-04	-2.50E-04	6.50E-04
	Average	4.10E-05	8.80E-04	1.10E-04	8.60E-04	2.80E-04	7.50E-04	-1.80E-04	9.50E-04	-1.60E-04	8.40E-04
ZrNb-95	Quarters 1-2	2.80E-03	6.00E-03	-2.70E-03	5.80E-03	-1.00E-03	6.60E-03	3.80E-03	6.10E-03	-2.30E-04	5.20E-03
	Quarters 3-4	-6.90E-04	2.20E-03	9.60E-04	1.80E-03	-1.30E-03	1.80E-03	-4.00E-04	1.90E-03	9.40E-04	1.60E-03
	Average	1.00E-03	4.10E-03	-8.80E-04	3.80E-03	-1.20E-03	4.20E-03	1.70E-03	4.00E-03	3.60E-04	3.40E-03

Table A-2.3. Results of Air Monitoring for 1991 (pCi/m^3)

Radionuclide		Location N978		Location N984		Location N985		Location N991		Location N992	
		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
Be-7	Quarters 1-2	5.40E-02	3.50E-02	-2.40E-03	5.90E-02	7.60E-02	5.00E-02	1.20E-01	4.80E-02	2.50E-02	4.50E-02
	Quarters 3-4	7.30E-02	1.80E-02	6.40E-02	1.90E-02	7.90E-02	1.90E-02	9.40E-02	1.90E-02	8.90E-02	2.00E-02
	Average	6.30E-02	2.70E-02	3.10E-02	3.90E-02	7.80E-02	3.40E-02	1.10E-01	3.40E-02	5.70E-02	3.20E-02
CePr-144	Quarters 1-2	-5.30E-04	2.10E-03	-1.10E-03	3.40E-03	1.90E-03	3.10E-03	-1.20E-03	2.50E-03	-7.50E-04	2.70E-03
	Quarters 3-4	7.90E-04	2.20E-03	-4.80E-04	2.00E-03	9.60E-04	2.00E-03	-5.10E-04	2.30E-03	3.40E-04	1.80E-03
	Average	1.30E-04	2.10E-03	-7.70E-04	2.70E-03	1.40E-03	2.50E-03	-8.70E-04	2.40E-03	-2.10E-04	2.20E-03
Co-60	Quarters 1-2	8.00E-05	2.20E-04	1.40E-04	1.70E-04	-2.40E-05	2.00E-04	-7.50E-05	3.70E-04	1.50E-04	2.50E-04
	Quarters 3-4	1.90E-05	2.30E-04	5.00E-05	1.70E-04	-5.60E-05	2.40E-04	7.90E-05	1.90E-04	2.90E-04	2.80E-04
	Average	1.40E-04	2.20E-04	9.70E-05	1.70E-04	-4.00E-05	2.20E-04	1.80E-06	2.80E-04	2.20E-04	2.60E-04
Cs-134	Quarters 1-2	1.80E-04	2.50E-04	-2.00E-04	3.30E-04	-1.00E-04	2.10E-04	8.80E-06	2.90E-04	-1.00E-04	2.60E-04
	Quarters 3-4	-2.80E-05	1.80E-04	-7.40E-05	2.10E-04	-9.60E-05	1.90E-04	-1.10E-04	2.20E-04	-1.40E-04	2.00E-04
	Average	7.70E-05	2.20E-04	-1.40E-04	2.70E-04	-9.80E-05	2.00E-04	-4.80E-05	2.50E-04	-1.20E-04	2.30E-04
Cs-137	Quarters 1-2	1.70E-04	2.20E-04	5.90E-04	3.30E-04	4.50E-04	2.80E-04	1.20E-04	2.30E-04	1.70E-04	2.00E-04
	Quarters 3-4	2.00E-04	1.90E-04	9.50E-04	3.10E-04	1.90E-04	2.30E-04	6.40E-04	2.00E-04	6.50E-05	1.80E-04
	Average	1.90E-04	2.00E-04	7.70E-04	3.20E-04	3.20E-04	2.50E-04	3.80E-04	2.20E-04	1.20E-04	1.90E-04
Eu-154	Quarters 1-2	3.20E-04	6.10E-04	3.10E-04	1.00E-03	-5.60E-04	8.00E-04	-1.00E-03	9.10E-04	3.90E-04	5.60E-04
	Quarters 3-4	-2.90E-04	7.40E-04	5.00E-04	4.70E-04	2.20E-04	7.20E-04	4.20E-04	3.40E-04	1.40E-04	5.00E-04
	Average	1.70E-05	6.70E-04	4.00E-04	7.60E-04	-1.70E-04	7.60E-04	-3.10E-04	6.30E-04	2.70E-04	5.80E-04
Eu-155	Quarters 1-2	2.70E-04	3.10E-04	-2.80E-04	6.50E-04	-1.70E-04	4.20E-04	1.20E-04	4.80E-04	9.80E-05	4.70E-04
	Quarters 3-4	-2.40E-05	4.40E-04	-2.80E-04	5.10E-04	1.10E-04	5.00E-04	2.60E-04	4.80E-04	6.10E-05	4.70E-04
	Average	1.20E-04	3.80E-04	-2.80E-04	5.80E-04	-3.20E-05	4.60E-04	1.90E-04	4.80E-04	7.90E-05	4.70E-04
K-40	Quarters 1-2	5.20E-03	3.40E-03	1.20E-02	5.40E-03	2.00E-03	3.90E-03	5.80E-03	4.00E-03	1.00E-03	3.50E-03
	Quarters 3-4	1.10E-03	2.00E-03	2.30E-03	2.70E-03	3.90E-03	3.00E-03	7.10E-03	3.00E-03	5.20E-03	2.90E-03
	Average	3.10E-03	2.70E-03	6.90E-03	4.10E-03	3.00E-03	3.40E-03	6.50E-03	3.50E-03	3.10E-03	3.20E-03

Table A-2.3. Results of Air Monitoring for 1991 (pCi/m^3)

Radionuclide		Location N978		Location N984		Location N985		Location N991		Location N992	
		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
Pu-238	Quarters 1-2	3.50E-07	5.00E-07	6.10E-08	2.90E-07	2.80E-07	4.30E-07	-8.70E-08	4.80E-07	-8.30E-08	3.90E-07
	Quarters 3-4	6.20E-07	8.60E-07	4.20E-07	7.00E-04	6.00E-07	6.20E-07	1.20E-06	8.70E-07	6.50E-07	6.50E-07
	Average	4.80E-07	6.80E-07	2.40E-07	5.00E-07	4.40E-07	5.20E-07	5.40E-07	6.70E-07	2.80E-07	5.20E-07
Pu-239, 240	Quarters 1-2	4.00E-06	1.60E-06	3.60E-06	1.50E-06	3.00E-06	1.20E-06	2.90E-06	1.40E-06	5.90E-06	1.90E-06
	Quarters 3-4	8.60E-07	7.90E-07	3.90E-06	2.00E-06	3.70E-06	1.50E-06	1.10E-05	2.80E-06	5.00E-06	1.80E-06
	Average	2.40E-06	1.20E-06	3.80E-06	1.80E-06	3.30E-06	1.40E-06	7.00E-06	2.10E-06	5.50E-06	1.30E-06
Ru-106	Quarters 1-2	-3.40E-04	2.40E-03	2.10E-04	3.80E-03	2.30E-03	2.10E-03	-1.20E-03	3.40E-03	9.60E-05	2.40E-03
	Quarters 3-4	-8.20E-04	2.10E-03	3.50E-04	2.00E-03	-8.50E-04	2.10E-03	-8.70E-04	2.40E-03	-1.10E-04	1.80E-03
	Average	-5.80E-04	2.20E-03	2.80E-04	2.90E-03	7.20E-04	2.10E-03	-1.10E-03	2.90E-03	-6.50E-06	2.10E-03
Sb-125	Quarters 1-2	3.00E-04	4.90E-04	5.80E-04	5.20E-04	-8.10E-04	7.40E-04	-1.80E-04	6.40E-04	2.40E-04	6.50E-04
	Quarters 3-4	-4.10E-04	4.80E-04	-6.10E-05	4.90E-04	1.70E-05	5.20E-04	5.30E-05	5.00E-04	-2.70E-04	5.90E-04
	Average	-5.70E-05	4.80E-04	2.60E-04	5.00E-04	-4.00E-04	6.30E-04	-6.50E-05	5.70E-04	-1.80E-05	6.20E-04
Sr-90	Quarters 1-2	3.30E-05	2.30E-05	1.00E-04	3.90E-05	5.60E-05	2.80E-05	4.00E-06	1.60E-05	2.20E-05	2.10E-05
	Quarters 3-4	1.20E-04	3.80E-05	3.60E-04	8.30E-05	2.30E-05	2.30E-05	3.70E-05	2.30E-05	1.40E-05	1.90E-05
	Average	7.50E-05	3.10E-05	2.30E-04	6.10E-05	3.90E-05	2.60E-05	2.10E-05	2.00E-05	1.80E-05	2.00E-05
U-234	Quarters 1-2	8.40E-06	2.80E-06	7.90E-06	2.90E-06	1.60E-05	4.10E-06	1.10E-05	3.10E-06	1.30E-05	3.60E-06
	Quarters 3-4	9.20E-06	2.80E-06	1.70E-05	5.80E-06	1.60E-05	4.00E-06	9.40E-06	3.60E-06	1.20E-05	2.90E-06
	Average	8.80E-06	2.80E-06	1.20E-05	4.30E-06	1.60E-05	4.00E-06	1.00E-05	3.40E-06	1.20E-05	3.30E-06
U-235	Quarters 1-2	1.80E-07	5.10E-07	1.30E-07	5.70E-07	9.40E-07	9.30E-07	2.60E-07	3.10E-07	6.50E-07	7.50E-07
	Quarters 3-4	2.30E-07	5.40E-07	1.00E-05	4.30E-06	7.10E-07	8.70E-07	6.50E-07	8.70E-07	1.10E-06	7.70E-07
	Average	2.00E-07	5.20E-07	5.20E-06	2.40E-06	8.30E-07	9.00E-07	4.60E-07	7.40E-07	8.80E-07	7.60E-07
U-238	Quarters 1-2	7.30E-06	2.70E-06	1.10E-05	3.20E-06	2.10E-05	4.70E-06	1.30E-05	3.40E-06	1.20E-05	3.50E-06
	Quarters 3-4	6.70E-06	2.40E-06	2.20E-05	6.60E-06	1.50E-05	3.70E-06	1.10E-05	3.90E-06	1.50E-05	3.30E-06
	Average	7.00E-06	2.50E-06	1.60E-05	4.90E-06	1.80E-05	4.20E-06	1.20E-05	3.70E-06	1.40E-05	3.40E-06

Table A-2.3. Results of Air Monitoring for 1991 (pCi/m^3)

Radionuclide		Location N978		Location N984		Location N985		Location N991		Location N992	
		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
Zn-65	Quarters 1-2	-1.40E-03	1.20E-03	-3.60E-04	1.00E-03	3.80E-04	9.60E-04	1.00E-04	9.20E-04	-4.60E-04	1.20E-03
	Quarters 3-4	-9.90E-05	7.70E-04	-1.20E-04	5.20E-04	-4.80E-04	6.60E-04	1.30E-04	7.20E-04	4.00E-04	5.30E-04
	Average	-7.30E-04	9.90E-04	-2.40E-04	7.70E-04	-5.10E-05	8.10E-04	1.10E-04	8.20E-04	-3.10E-05	8.80E-04
ZrNb-95	Quarters 1-2	1.60E-03	7.40E-03	-3.60E-03	7.40E-03	3.70E-03	5.50E-03	-1.20E-03	3.40E-03	8.20E-04	5.30E-03
	Quarters 3-4	-4.20E-04	1.30E-03	2.80E-04	1.50E-03	1.30E-04	1.80E-03	-2.10E-03	2.10E-03	-3.30E-04	2.20E-03
	Average	5.70E-04	4.40E-03	-1.70E-03	4.40E-03	1.90E-03	3.60E-03	-1.70E-03	2.70E-03	2.50E-04	3.80E-03

Source: Schmidt et al. 1992.
Negative values indicate concentrations at or near background levels of radioactivity.
Shaded areas indicate a positive detection, the result is greater than the error.

Table A-2.4. Result of Grid Site Vegetation Sampling 1985-1989 (pCi/g).
Location 2E11

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Results
Be-7	--	--	--	--	--	--	--	--	--	--	--
Ce-141	--	--	--	--	--	--	< -1.802E-02	8.30E-02	--	--	< -1.80E-02
Co-60	*	--	--	--	--	--	< 1.10E-03	2.10E-02	--	--	< 1.10E-03
Cs-134	--	--	8.81E-02	4.44E-02	--	--	a/	--	--	--	8.81E-02
Cs-137	3.23E-01	3.14E-02	3.92E-01	6.68E-02	--	--	1.40E-01	3.10E-02	--	--	2.85E-01
Eu-152	7.00E-02	6.10E-02	--	--	--	--	< 4.70E-02	9.70E-02	--	--	5.85E-02
Eu-154	*	--	2.23E-01	1.40E-01	--	--	< -4.10E-02	7.10E-02	--	--	9.10E-02
Eu-155	--	--	1.13E-01	1.07E-01	--	--	< -1.80E-04	5.80E-02	--	--	5.64E-02
I-129	--	--	--	--	--	--	b/	--	--	--	--
K-40	--	--	--	--	--	--	--	--	--	--	--
Nb-95	--	--	--	--	--	--	< -5.60E-02	5.40E-02	--	--	< -5.60E-02
Pb-212	--	--	--	--	--	--	9.30E-01	--	--	--	9.30E-01
Pb-214	--	--	--	--	--	--	2.00E+00	--	--	--	2.00E+00
Pu-238	*	--	--	--	--	--	b/	--	--	--	--
Pu-239	*	--	--	--	--	--	b/	--	--	--	--
Ru-103	*	--	--	--	--	--	b/	--	--	--	--
Ru-106	*	--	--	--	--	--	a/	--	--	--	--
Sr-90	*	--	--	--	--	--	b/	--	--	--	--
Tc-99	--	--	--	--	--	--	--	--	--	--	--
Zr-95	*	--	1.38E-01	1.02E-01	--	--	< 4.20E-02	4.50E-02	--	--	< 4.20E-02

Table A-2.4. Result of Grid Site Vegetation Sampling 1985-1989 (pCi/g).
Location 2E12

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Results
Be-7	–	–	–	–	–	–	–	–	1.85E+00	3.19E-01	1.85E+00
Ce-141	–	–	–	–	–	–	< 1.40E-04	5.90E-02	2.78E-03	2.65E-03	1.46E-03
Co-60	*	–	–	–	1.80E-02	1.50E-02	7.70E-03	1.50E-02	2.45E-03	2.15E-02	9.38E-03
Cs-134	–	–	1.79E-01	4.25E-02	3.20E-02	1.80E-02	a/	–	–	–	1.06E-01
Cs-137	3.31E-01	3.51E-02	4.28E-01	6.52E-02	2.70E-01	3.70E-02	3.60E-01	4.40E-02	2.27E-01	3.69E-02	3.23E-01
Eu-152	*	–	1.44E-01	6.94E-02	5.30E-02	5.80E-02	-6.40E-02	6.80E-02	-4.68E-02	8.90E-02	2.16E-02
Eu-154	*	–	–	–	2.00E-03	4.90E-02	1.20E-02	5.00E-02	2.56E-02	6.14E-02	1.32E-02
Eu-155	*	–	–	–	-3.20E-02	4.30E-02	-6.80E-04	3.70E-02	1.60E-02	5.72E-02	-5.56E-03
I-129	–	–	–	–	b/	–	b/	–	6.08E-02	3.19E-01	6.08E-02
K-40	–	–	–	–	–	–	–	–	1.06E+01	1.30E+00	1.06E+01
Nb-95	*	–	–	–	< 1.40E-02	2.10E-02	-4.00E-02	5.30E-02	-2.49E-03	2.30E-02	-9.50E-03
Pb-212	–	–	–	–	–	–	–	–	2.78E-02	3.42E-02	2.78E-02
Pb-214	–	–	–	–	–	–	–	–	4.11E-02	3.52E-02	4.11E-02
Pu-238	*	–	–	–	b/	–	b/	–	3.03E-04	2.23E-04	3.03E-04
Pu-239	*	–	–	–	b/	–	b/	–	1.08E-03	3.99E-04	1.08E-03
Ru-103	*	–	1.13E-01	7.04E-02	–	–	–	–	–	–	1.13E-01
Ru-106	*	–	–	–	a/	–	a/	–	–	–	–
Sr-90	*	–	–	–	b/	–	3.40E+00	6.60E-01	1.06E-01	2.11E-02	1.75E+00
Tc-99	–	–	–	–	b/	–	b/	–	7.38E-01	1.15E+00	7.38E-01
Zr-95	*	–	–	–	< 1.70E-02	2.90E-02	3.70E-02	4.60E-02	-1.06E-02	3.73E-02	1.45E-02

Table A-2.4. Result of Grid Site Vegetation Sampling 1985-1989 (pCi/g).
Location 2E17

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Results
Be-7	–	–	–	–	–	–	–	–	2.64E+00	3.71E-01	2.64E+00
Ce-141	–	–	–	–	–	–	-2.20E-02	6.20E-02	5.19E-03	2.06E-02	-8.41E-03
Co-60	3.71E-02	1.92E-02	–	–	1.70E-02	1.30E-02	1.80E-02	1.70E-02	1.27E-02	1.68E-02	2.12E-02
Cs-134	–	–	4.50E-01	8.66E-02	4.20E-02	1.80E-02	a/	–	–	–	2.46E-01
Cs-137	1.16E+00	7.93E-02	1.04E+00	1.34E-01	5.40E-01	6.40E-02	3.50E-01	4.50E-02	3.07E-01	4.34E-02	6.79E-01
Eu-152	*	–	–	–	2.80E-02	6.30E-02	-2.80E-02	6.90E-02	6.96E-03	7.05E-02	2.32E-03
Eu-154	2.15E-01	5.81E-02	–	–	-2.40E-02	5.10E-02	2.20E-02	5.20E-02	3.41E-02	4.87E-02	6.18E-02
Eu-155	2.95E-01	6.37E-02	–	–	4.00E-02	5.00E-02	1.80E-02	4.10E-02	4.03E-02	3.84E-02	9.83E-02
I-129	–	–	–	–	b/	–	9.20E-03	2.90E-01	-5.51E-02	2.67E-01	-2.30E-02
K-40	–	–	–	–	–	–	–	–	1.39E+01	1.57E+00	1.39E+01
Nb-95	*	–	1.29E-01	9.82E-02	-1.20E-02	2.30E-02	-5.60E-02	5.40E-02	-1.07E-02	1.77E-02	1.26E-02
Pb-212	–	–	–	–	–	–	–	–	7.77E-02	3.41E-02	7.77E-02
Pb-214	–	–	–	–	–	–	–	–	8.68E-02	3.97E-02	8.68E-02
Pu-238	4.30E-03	9.00E-04	7.00E-04	5.00E-04	3.30E-04	2.10E-04	4.10E-04	2.50E-04	5.85E-04	3.42E-04	1.27E-03
Pu-239	1.43E-02	1.90E-03	2.00E-03	9.00E-04	2.10E-03	5.70E-04	1.10E-02	1.70E-03	3.38E-03	9.07E-04	6.56E-03
Ru-103	*	–	4.85E-01	1.17E-01	b/	–	–	–	–	–	4.85E-01
Ru-106	5.49E-01	1.38E-01	9.01E-01	3.86E-01	a/	–	a/	–	–	–	7.25E-01
Sr-90	2.73E+01	5.42E+00	9.43E+00	1.74E+00	1.00E+01	2.40E+00	7.20E+00	1.50E+00	5.81E+00	1.15E+00	1.19E+01
Tc-99	–	–	–	–	b/	–	2.70E+00	3.00E+00	8.15E-01	1.16E+00	1.76E+00
Zr-95	2.54E-02	2.48E-02	–	–	< 1.70E-02	2.80E-02	4.20E-02	4.50E-02	-1.47E-02	3.06E-02	1.74E-02

Table A-2.4. Result of Grid Site Vegetation Sampling 1985-1989 (pCi/g).
Location 2E18

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Results
Be-7	–	–	–	–	–	–	–	–	2.63E+00	3.80E-01	2.63E+00
Ce-141	–	–	–	–	–	–	-3.30E-02	6.20E-02	-6.82E-03	2.15E-02	-1.99E-02
Co-60	*	–	–	–	< 4.30E-03	2.10E-02	4.80E-03	1.40E-02	1.08E-02	1.88E-02	6.63E-03
Cs-134	–	–	2.23E-01	5.48E-02	7.60E-02	2.80E-02	a/	–	–	–	1.50E-01
Cs-137	5.28E-01	4.17E-02	1.85E+00	2.13E-01	9.10E-01	1.10E-01	7.00E-01	7.90E-02	4.73E-01	6.02E-02	9.83E-01
Eu-152	*	–	1.92E-01	9.24E-02	2.60E-02	9.10E-02	0.00E+00	6.40E-02	-1.27E-02	8.80E-02	5.13E-02
Eu-154	*	–	–	–	-3.50E-02	6.90E-02	-1.20E-02	4.70E-02	8.42E-03	6.78E-02	-1.29E-02
Eu-155	*	–	–	–	3.70E-02	6.10E-02	3.20E-02	3.70E-02	1.40E-02	4.50E-02	2.77E-02
I-129	–	–	–	–	b/	–	3.50E-01	2.50E-01	2.20E-01	2.30E-01	2.76E-01
K-40	–	–	–	–	–	–	–	–	1.45E+01	1.64E+00	1.45E+01
Nb-95	*	–	–	–	< 1.00E-02	2.90E-02	-1.90E-02	4.60E-02	6.23E-03	2.17E-02	-8.93E-04
Pb-212	–	–	–	–	–	–	–	–	5.86E-02	3.03E-02	5.86E-02
Pb-214	–	–	–	–	–	–	–	–	8.79E-02	3.47E-02	8.79E-02
Pu-238	*	–	–	–	4.50E-04	2.70E-04	2.50E-04	2.00E-04	1.17E-04	1.31E-04	2.72E-04
Pu-239	*	–	–	–	1.90E-03	5.70E-04	2.00E-03	6.20E-04	1.00E-03	4.06E-04	1.63E-03
Ru-103	*	–	2.16E-01	1.18E-01	–	–	–	–	–	–	2.16E-01
Ru-106	3.23E-01	1.20E-01	–	–	a/	–	a/	–	–	–	3.23E-01
Sr-90	*	–	–	–	2.10E-01	5.40E-02	1.10E+00	2.10E-01	5.18E-01	1.04E-01	6.09E-01
Tc-99	–	–	–	–	b/	–	2.40E+00	3.00E+00	3.26E-01	1.12E+00	1.36E+00
Zr-95	*	–	–	–	5.60E-02	4.30E-02	3.80E-02	4.30E-02	-4.72E-03	2.94E-02	2.98E-02

Table A-2.4. Result of Grid Site Vegetation Sampling 1985-1989 (pCi/g).
Location 2E23

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Results
Be-7	–	–	–	–	–	–	–	–	–	–	–
Ce-141	–	–	–	–	–	–	2.10E-02	7.70E-02	–	–	2.10E-02
Co-60	*	–	–	–	< -1.70E-02	2.30E-02	-5.40E-03	2.20E-02	–	–	-1.12E-02
Cs-134	–	–	7.80E-02	3.31E-02	a/	–	a/	–	–	–	7.80E-02
Cs-137	1.53E-01	3.02E-02	2.02E-01	4.16E-02	1.10E-01	3.30E-02	1.40E-01	2.90E-02	–	–	1.51E-01
Eu-152	*	–	–	–	-8.70E-02	9.70E-02	2.50E-02	8.10E-02	–	–	-3.10E-02
Eu-154	*	–	–	–	-3.80E-03	7.00E-02	-1.70E-02	7.20E-02	–	–	-1.04E-02
Eu-155	*	–	–	–	-1.70E-02	6.30E-02	-2.50E-02	5.30E-02	–	–	-2.10E-02
I-129	–	–	–	–	–	–	-3.80E-01	4.10E-01	–	–	-3.80E-01
K-40	–	–	–	–	–	–	–	–	–	–	–
Nb-95	*	–	–	–	< -3.40E-03	3.60E-02	-4.40E-02	6.50E-02	–	–	-2.37E-02
Pb-212	–	–	–	–	–	–	–	–	–	–	–
Pb-214	–	–	–	–	–	–	–	–	–	–	–
Pu-238	4.00E-04	2.00E-04	–	–	8.60E-05	1.70E-04	9.60E-05	1.30E-04	–	–	1.94E-04
Pu-239	4.10E-03	8.00E-04	6.00E-04	5.00E-04	2.90E-03	1.10E-03	2.20E-03	6.10E-04	–	–	2.45E-03
Ru-103	1.43E-01	4.19E-02	8.81E-01	1.47E-01	–	–	–	–	–	–	5.12E-01
Ru-106	9.45E-01	2.83E-01	8.46E+00	1.02E+00	a/	–	3.40E-01	2.00E-01	–	–	3.25E+00
Sr-90	1.39E+00	2.80E-01	1.69E-01	4.75E-02	3.50E-02	1.20E-02	1.40E-01	2.90E-02	–	–	4.34E-01
Tc-99	–	–	–	–	b/	–	1.10E+00	2.90E+00	–	–	1.10E+00
Zr-95	*	–	–	–	< -5.20E-03	4.90E-02	-3.60E-02	6.10E-02	–	–	-2.06E-02

Table A-2.4. Result of Grid Site Vegetation Sampling 1985-1989 (pCi/g).
Location 2E24

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Results
Be-7	–	–	–	–	–	–	–	–	3.23E+00	4.34E-01	3.23E+00
Ce-141	–	–	–	–	–	–	2.30E-02	8.80E-02	-1.92E-02	2.87E-02	1.90E-03
Co-60	7.21E-02	4.77E-02	–	–	3.90E-03	1.40E-02	9.70E-03	1.90E-02	2.41E-02	1.84E-02	2.75E-02
Cs-134	–	–	1.97E-01	3.95E-02	5.50E-02	1.80E-02	a/	–	–	–	1.26E-01
Cs-137	3.51E-01	7.66E-02	1.24E+00	1.40E-01	1.50E+00	1.60E-01	1.30E+00	1.40E-01	1.09E+00	1.21E-01	1.10E+00
Eu-152	*	–	7.31E-02	5.95E-02	1.30E-02	6.70E-02	2.70E-02	8.50E-02	-7.86E-02	1.01E-01	8.63E-03
Eu-154	*	–	–	–	5.10E-02	4.70E-02	5.50E-02	6.20E-02	2.29E-02	5.96E-02	4.30E-02
Eu-155	*	–	–	–	-3.30E-02	4.00E-02	2.60E-02	5.00E-02	8.13E-04	6.03E-02	-2.06E-03
I-129	–	–	–	–	-3.90E-01	4.10E-01	1.50E-01	2.60E-01	2.48E-01	2.91E-01	2.67E-03
K-40	–	–	–	–	–	–	–	–	1.30E+01	1.49E+00	1.30E+01
Nb-95	*	–	–	–	-6.60E-03	2.00E-02	-1.40E-02	7.10E-02	-4.73E-03	2.18E-02	-8.44E-03
Pb-212	–	–	–	–	–	–	–	–	5.13E-02	3.59E-02	5.13E-02
Pb-214	–	–	–	–	–	–	–	–	9.76E-02	4.52E-02	9.76E-02
Pu-238	1.40E-03	1.20E-03	–	–	7.80E-05	1.60E-04	1.90E-04	2.50E-04	8.90E-04	5.04E-04	6.40E-04
Pu-239	9.50E-03	3.10E-03	9.00E-03	1.70E-03	5.90E-03	1.20E-03	1.20E-02	2.10E-03	8.09E-03	1.80E-03	8.90E-03
Ru-103	1.67E-01	1.01E-01	3.46E-01	9.68E-02	–	–	–	–	–	–	2.57E-01
Ru-106	6.67E-01	4.46E-01	1.66E+00	3.18E-01	a/	–	a/	–	4.42E+00	5.42E-01	2.25E+00
Sr-90	2.51E+00	5.04E-01	4.28E-01	8.72E-02	3.80E-01	9.70E-02	8.90E-01	1.70E-01	7.79E-01	1.49E-01	9.97E-01
Tc-99	–	–	–	–	2.00E-01	8.40E-01	2.30E+00	3.00E+00	1.48E+00	1.26E+00	1.33E+00
Zr-95	*	–	–	–	-1.80E-02	2.70E-02	2.80E-02	6.80E-02	-1.68E-02	3.27E-02	2.27E-03

Table A-2.4. Result of Grid Site Vegetation Sampling 1985-1989 (pCi/g).
Location 2E29

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Results
Be-7	–	–	–	–	–	–	–	–	2.01E+00	3.33E-01	2.01E+00
Ce-141	–	–	–	–	–	–	< -5.20E-02	7.40E-02	-2.07E-02	2.37E-02	-3.64E-02
Co-60	*	–	2.63E-02	2.40E-02	–	–	< 1.20E-02	2.10E-02	8.53E-03	1.87E-02	1.56E-02
Cs-134	–	–	1.16E-01	3.39E-02	–	–	a/	–	–	–	1.16E-00
Cs-137	*	–	2.49E-01	4.83E-02	–	–	7.60E-02	3.10E-02	4.52E-02	2.24E-02	1.23E-01
Eu-152	*	–	–	–	–	–	< -3.10E-02	8.70E-02	-8.29E-02	9.26E-02	-5.70E-02
Eu-154	*	–	–	–	–	–	< 4.40E-02	6.20E-02	-2.53E-02	5.36E-02	9.35E-03
Eu-155	*	–	–	–	–	–	< -2.50E-02	4.60E-02	3.59E-03	3.70E-02	-1.07E-02
I-129	–	–	–	–	–	–	–	–	0.00E+00	1.94E-01	0.00E+00
K-40	–	–	–	–	–	–	–	–	1.49E+01	1.71E+00	1.49E+01
Nb-95	*	–	–	–	–	–	< -3.00E-02	7.00E-02	1.42E-03	2.12E-02	-1.43E-02
Pb-212	–	–	–	–	–	–	–	–	1.98E-02	2.96E-02	1.98E-02
Pb-214	–	–	–	–	–	–	–	–	3.28E-02	2.96E-02	3.28E-02
Pu-238	*	–	4.00E-04	4.00E-04	–	–	b/	–	9.47E-05	1.35E-04	2.47E-04
Pu-239	9.00E-04	6.00E-04	1.70E-03	7.00E-04	–	–	b/	–	9.24E-04	3.50E-04	1.17E-03
Ru-103	*	–	5.38E-01	1.17E-01	–	–	–	–	–	–	5.38E-01
Ru-106	4.52E-01	3.43E-01	6.21E+00	7.38E-01	–	–	a/	–	–	–	3.33E+00
Sr-90	2.01E-01	5.41E-02	1.42E-01	3.53E-02	–	–	1.90E-01	3.80E-02	1.10E-01	2.20E-02	1.61E-01
Tc-99	–	–	–	–	–	–	b/	–	1.11E+00	1.23E+00	1.11E+00
Zr-95	*	–	–	–	–	–	< 1.70E-02	6.40E-02	1.16E-02	3.25E-02	1.43E-02

Table A-2.4. Result of Grid Site Vegetation Sampling 1985-1989 (pCi/g).
Location 2E30

	1985		1986		1987		1988		1989		
Radionuclide	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Average Results
Be-7	--	--	--	--	--	--	--	--	1.50E+00	2.50E-01	1.50E+00
Ce-141	--	--	--	--	--	--	< 2.10E-02	7.20E-02	-1.49E-02	1.94E-02	3.05E-03
Co-60	--	--	--	--	--	--	< 1.00E-02	1.50E-02	1.87E-03	1.44E-02	5.94E-03
Cs-134	--	--	--	--	--	--	a/	a/	--	--	--
Cs-137	--	--	--	--	--	--	3.90E-01	4.80E-02	7.68E-02	2.31E-02	2.33E-01
Eu-152	--	--	--	--	--	--	< 1.80E-02	6.30E-02	-4.89E-02	7.49E-02	-1.55E-02
Eu-154	--	--	--	--	--	--	< -2.30E-02	4.80E-02	-2.38E-02	4.71E-02	-2.34E-02
Eu-155	--	--	--	--	--	--	< -2.50E-03	4.00E-02	1.97E-02	3.19E-02	8.60E-03
I-129	--	--	--	--	--	--	--	--	7.35E-02	2.49E-01	7.35E-02
K-40	--	--	--	--	--	--	--	--	1.09E+01	1.25E+00	1.09E+01
Nb-95	--	--	--	--	--	--	< 1.40E-02	4.90E-02	-2.10E-02	1.96E-02	-3.05E-03
Pb-212	--	--	--	--	--	--	--	--	7.60E-02	3.18E-02	7.60E-02
Pb-214	--	--	--	--	--	--	--	--	7.13E-02	2.78E-02	7.13E-02
Pu-238	--	--	--	--	--	--	b/	--	5.30E-04	3.70E-04	5.30E-04
Pu-239	--	--	--	--	--	--	b/	--	4.67E-03	1.15E-03	4.67E-03
Ru-103	--	--	--	--	--	--	--	--	--	--	--
Ru-106	--	--	--	--	--	--	2.80E+00	3.60E-01	6.62E-01	1.75E-01	1.73E+00
Sr-90	--	--	--	--	--	--	4.70E-01	9.00E-02	5.69E-01	1.06E-01	5.20E-01
Tc-99	--	--	--	--	--	--	b/	--	5.78E-01	1.19E+00	5.78E-01
Zr-95	--	--	--	--	--	--	< 4.30E-02	4.70E-02	5.86E-03	2.69E-02	2.44E-02

Table A-2.4. Result of Grid Site Vegetation Sampling 1985-1989 (pCi/g).

Location 2ED

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Results
Be-7	–	–	–	–	–	–	–	–	–	–	–
Ce-141	–	–	–	–	–	–	-9.50E-02	9.60E-02	–	–	-9.50E-02
Co-60	*	–	–	–	1.90E-02	1.80E-02	-1.40E-03	2.00E-02	–	–	8.80E-03
Cs-134	–	–	2.50E-01	6.93E-02	6.80E-02	2.40E-02	3.80E-02	2.00E-02	–	–	1.19E-01
Cs-137	2.43E-01	7.05E-02	1.95E+00	2.30E-01	3.00E-01	4.40E-02	6.40E-01	7.50E-02	–	–	7.83E-01
Eu-152	*	–	–	–	0.00E+00	8.40E-02	3.00E-02	8.60E-02	–	–	1.50E-02
Eu-154	*	–	–	–	-1.90E-02	6.00E-02	-1.10E-01	6.70E-02	–	–	-6.45E-02
Eu-155	*	–	–	–	1.40E-03	4.50E-02	3.40E-02	5.10E-02	–	–	1.77E-02
I-129	–	–	–	–	-2.80E-01	3.10E-01	3.40E-01	8.40E-01	–	–	3.00E-02
K-40	–	–	–	–	–	–	–	–	–	–	–
Nb-95	*	–	2.10E-01	1.25E-01	-2.30E-02	3.30E-02	2.10E-02	7.00E-02	–	–	6.93E-02
Pb-212	–	–	–	–	–	–	–	–	–	–	–
Pb-214	–	–	–	–	–	–	–	–	–	–	–
Pu-238	*	–	–	–	3.10E-05	6.50E-05	1.50E-04	1.50E-04	–	–	9.05E-05
Pu-239	*	–	–	–	8.00E-03	1.30E-03	1.50E-02	2.10E-03	–	–	1.15E-02
Ru-103	*	–	2.36E-01	1.51E-01	–	–	–	–	–	–	2.36E-01
Ru-106	*	–	–	–	a/	–	1.10E+00	2.70E-01	–	–	1.10E+00
Sr-90	*	–	–	–	3.70E-01	9.40E-02	3.00E-01	5.70E-02	–	–	3.35E-01
Tc-99	–	–	–	–	3.80E-01	8.50E-01	1.40E+00	3.00E+00	–	–	8.90E-01
Zr-95	*	–	1.23E-01	1.15E-01	4.90E-03	3.90E-02	6.90E-02	6.60E-02	–	–	6.56E-02

Table A-2.4. Result of Grid Site Vegetation Sampling 1985-1989 (pCi/g).
Location 2EDB

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Results
Be-7	–	–	–	–	–	–	–	–	–	–	–
Ce-141	–	–	–	–	–	–	–	–	–	–	–
Co-60	–	–	–	–	< 1.40E-02	1.60E-02	–	–	–	–	1.40E-02
Cs-134	–	–	–	–	5.20E-02	2.10E-02	–	–	–	–	5.20E-02
Cs-137	–	–	–	–	2.80E-01	3.90E-02	–	–	–	–	2.80E-01
Eu-152	–	–	–	–	< 4.80E-02	6.40E-02	–	–	–	–	4.80E-02
Eu-154	–	–	–	–	< -2.90E-02	4.90E-02	–	–	–	–	-2.90E-02
Eu-155	–	–	–	–	< 1.40E-02	3.80E-02	–	–	–	–	1.40E-02
I-129	–	–	–	–	< -1.40E-01	3.70E-01	–	–	–	–	-1.40E-01
K-40	–	–	–	–	–	–	–	–	–	–	–
Nb-95	–	–	–	–	< 1.80E-02	2.90E-02	–	–	–	–	1.80E-02
Pb-212	–	–	–	–	–	–	–	–	–	–	–
Pb-214	–	–	–	–	–	–	–	–	–	–	–
Pu-238	–	–	–	–	< 8.90E-05	1.30E-04	–	–	–	–	8.90E-05
Pu-239	–	–	–	–	8.00E-03	1.50E-03	–	–	–	–	8.00E-03
Ru-103	–	–	–	–	–	–	–	–	–	–	–
Ru-106	–	–	–	–	a/	–	–	–	–	–	–
Sr-90	–	–	–	–	3.30E-01	8.40E-02	–	–	–	–	3.30E-01
Tc-99	–	–	–	–	9.60E-01	8.80E-01	–	–	–	–	9.60E-01
Zr-95	–	–	–	–	< 8.90E-03	3.90E-02	–	–	–	–	8.90E-03

Table A-2.4. Result of Grid Site Vegetation Sampling 1985-1989 (pCi/g).
Location 2EDC

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Results
Be-7	–	–	–	–	–	–	–	–	2.98E+00	4.80E-01	2.98E+00
Ce-141	–	–	–	–	–	–	–	–	-2.25E-02	3.41E-02	-2.25E-02
Co-60	–	–	–	–	–	–	–	–	6.69E-03	2.04E-02	6.69E-03
Cs-134	–	–	–	–	–	–	–	–	–	–	–
Cs-137	–	–	–	–	–	–	–	–	4.27E+00	4.37E-01	4.27E+00
Eu-152	–	–	–	–	–	–	–	–	6.64E-02	7.72E-02	6.64E-02
Eu-154	–	–	–	–	–	–	–	–	6.04E-02	5.72E-02	6.04E-02
Eu-155	–	–	–	–	–	–	–	–	2.10E-02	5.15E-02	2.10E-02
I-129	–	–	–	–	–	–	–	–	-5.80E-02	2.86E-01	-5.80E-02
K-40	–	–	–	–	–	–	–	–	1.32E+01	1.49E+00	1.32E+01
Nb-95	–	–	–	–	–	–	–	–	7.19E-03	2.58E-02	7.19E-03
Pb-212	–	–	–	–	–	–	–	–	1.06E-01	3.57E-02	1.04E-01
Pb-214	–	–	–	–	–	–	–	–	9.76E-02	4.39E-02	9.76E-02
Pu-238	–	–	–	–	–	–	–	–	4.83E-04	2.94E-04	4.83E-04
Pu-239	–	–	–	–	–	–	–	–	1.60E-02	2.43E-03	1.60E-02
Ru-103	–	–	–	–	–	–	–	–	–	–	–
Ru-106	–	–	–	–	–	–	–	–	5.09E-01	1.80E-01	5.09E-01
Sr-90	–	–	–	–	–	–	–	–	4.19E-01	8.42E-02	4.19E-01
Tc-99	–	–	–	–	–	–	–	–	7.47E-01	1.10E+00	7.47E-01
Zr-95	–	–	–	–	–	–	–	–	2.16E-02	3.53E-02	2.16E-02

Table A-2.4. Result of Grid Site Vegetation Sampling 1985-1989 (pCi/g).
Location GRT1

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Results
Be-7	–	–	–	–	–	–	–	–	3.00E+00	4.75E-01	3.00E+00
Ce-141	–	–	–	–	–	–	-7.50E-03	1.40E-02	-1.93E-02	4.76E-02	-1.34E-02
Co-60	–	–	–	–	< 5.50E-03	1.70E-02	-1.60E-03	1.40E-02	0.00E+00	2.24E-02	1.30E-03
Cs-134	–	–	–	–	6.10E-02	2.20E-02	a/	–	–	–	6.10E-02
Cs-137	–	–	–	–	3.60E-01	4.90E-02	3.40E-01	4.30E-02	1.03E+00	1.19E-01	5.77E-01
Eu-152	–	–	–	–	6.90E-02	6.70E-02	3.80E-03	4.70E-02	8.00E-02	9.64E-02	5.09E-02
Eu-154	–	–	–	–	< -5.80E-02	5.90E-02	7.60E-03	4.10E-02	7.66E-03	7.02E-02	-1.42E-02
Eu-155	–	–	–	–	< -2.50E-02	4.30E-02	7.20E-03	3.40E-02	-6.40E-03	5.45E-02	-8.70E-03
I-129	–	–	–	–	< -3.50E-01	3.00E-01	3.30E-01	2.10E-01	-1.23E-01	2.79E-01	-4.77E-02
K-40	–	–	–	–	–	–	–	–	1.18E+01	1.46E+00	1.18E+01
Nb-95	–	–	–	–	< -1.10E-02	2.80E-02	7.60E-03	1.20E-02	-1.15E-02	3.07E-02	-6.17E-03
Pb-212	–	–	–	–	–	–	–	–	9.51E-02	3.75E-02	9.51E-02
Pb-214	–	–	–	–	–	–	–	–	3.71E-02	4.51E-02	3.71E-02
Pu-238	–	–	–	–	3.20E-04	2.60E-04	9.60E-05	1.90E-04	1.59E-04	1.82E-04	1.92E-04
Pu-239	–	–	–	–	6.00E-03	1.30E-03	6.30E-03	1.30E-03	7.04E-03	1.24E-03	6.45E-03
Ru-103	–	–	–	–	–	–	–	–	–	–	–
Ru-106	–	–	–	–	a/	–	1.50E+00	2.30E-01	5.97E-01	2.70E-01	1.05E+00
Sr-90	–	–	–	–	2.20E-01	5.70E-02	2.70E-01	5.10E-02	4.56E-01	8.47E-02	3.15E-01
Tc-99	–	–	–	–	b/	–	2.40E+00	3.10E+00	5.59E-01	1.08E+00	1.48E+00
Zr-95	–	–	–	–	< 1.40E-02	4.20E-02	3.50E-03	2.10E-02	4.70E-03	4.51E-02	7.40E-03

Table A-2.4. Result of Grid Site Vegetation Sampling 1985-1989 (pCi/g).
Location GRT2

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Results
Be-7	--	--	--	--	--	--	--	--	2.61E+00	4.09E-01	2.61E+00
Ce-141	--	--	--	--	--	--	< -1.50E-03	1.90E-02	-4.05E-03	3.18E-02	-2.78E-03
Co-60	--	--	--	--	3.40E-02	2.50E-02	-1.60E-02	1.90E-02	-1.91E-02	1.97E-02	-3.67E-04
Cs-134	--	--	--	--	8.30E-02	3.00E-02	a/	--	--	--	8.30E-02
Cs-137	--	--	--	--	3.60E-01	5.00E-01	1.70E-01	3.70E-02	2.03E+00	2.15E-01	8.53E-01
Eu-152	--	--	--	--	< 7.50E-02	9.20E-02	1.20E-02	8.10E-02	3.94E-02	8.52E-02	4.21E-02
Eu-154	--	--	--	--	< 2.70E-02	7.70E-02	6.40E-02	5.50E-02	-1.52E-02	6.52E-02	2.53E-02
Eu-155	--	--	--	--	< 2.00E-02	6.10E-02	1.30E-03	4.30E-02	-1.06E-02	4.78E-02	3.57E-03
I-129	--	--	--	--	< -1.10E-01	2.20E-01	1.30E-01	2.20E-01	-2.49E-01	2.75E-01	-7.63E-02
K-40	--	--	--	--	--	--	--	--	1.30E+01	1.48E+00	1.30E+01
Nb-95	--	--	--	--	< 7.00E-03	2.50E-02	-1.20E-02	1.70E-02	3.09E-03	2.68E-02	-6.37E-04
Pb-212	--	--	--	--	--	--	--	--	1.05E-01	3.59E-02	1.05E-01
Pb-214	--	--	--	--	--	--	--	--	1.37E-01	4.24E-02	1.37E-01
Pu-238	--	--	--	--	< 1.90E-04	2.70E-04	7.90E-05	1.50E-04	4.45E-04	3.09E-04	2.38E-04
Pu-239	--	--	--	--	2.90E-03	1.10E-03	1.60E-03	7.90E-04	6.36E-03	1.29E-03	3.62E-03
Ru-103	--	--	--	--	--	--	--	--	--	--	--
Ru-106	--	--	--	--	a/	--	2.20E-01	1.70E-01	2.85E-01	1.37E-01	2.53E-01
Sr-90	--	--	--	--	3.60E-01	9.00E-02	1.10E-01	2.40E-02	2.75E-01	5.25E-02	2.48E-01
Tc-99	--	--	--	--	4.70E+00	1.10E+00	2.50E+00	3.10E+00	5.49E-01	1.08E+00	2.58E+00
Zr-95	--	--	--	--	< -1.30E-03	3.70E-02	1.00E-02	2.80E-02	1.70E-02	3.59E-02	8.57E-03

Table A-2.4. Result of Grid Site Vegetation Sampling 1985-1989 (pCi/g).
Location GRT4

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Results
Be-7	–	–	–	–	–	–	–	–	3.22E+00	4.44E-01	3.22E+00
Ce-141	–	–	–	–	–	–	2.30E-02	2.10E-02	1.61E-02	3.17E-02	1.96E-02
Co-60	–	–	–	–	< 1.50E-02	1.80E-02	5.30E-03	1.80E-02	6.96E-03	1.95E-02	9.09E-03
Cs-134	–	–	–	–	5.00E-02	2.20E-02	a/	–	–	–	5.00E-02
Cs-137	–	–	–	–	4.80E-01	6.10E-02	1.80E-01	3.40E-02	4.11E-01	5.21E-02	3.57E-01
Eu-152	–	–	–	–	< 2.90E-02	7.70E-02	-2.30E-02	7.90E-02	6.38E-02	8.01E-02	2.33E-02
Eu-154	–	–	–	–	< 4.30E-02	5.30E-02	-1.20E-02	6.10E-02	-5.42E-03	6.01E-02	8.53E-03
Eu-155	–	–	–	–	< -2.40E-02	5.00E-02	-1.90E-02	5.40E-02	3.29E-02	5.02E-02	-3.37E-03
I-129	–	–	–	–	< 4.60E-02	2.80E-01	3.30E-01	3.40E-01	-4.59E-03	1.75E-01	1.24E-01
K-40	–	–	–	–	–	–	–	–	1.17E+01	1.34E+00	1.17E+01
Nb-95	–	–	–	–	< 2.60E-03	3.20E-02	4.40E-03	1.80E-02	-1.78E-02	2.57E-02	-3.60E-03
Pb-212	–	–	–	–	–	–	–	–	7.78E-02	2.91E-02	7.78E-02
Pb-214	–	–	–	–	–	–	–	–	1.15E-01	3.76E-02	1.15E-01
Pu-238	–	–	–	–	< 9.90E-04	1.40E-04	-4.90E-05	1.10E-04	4.74E-04	2.99E-04	1.75E-04
Pu-239	–	–	–	–	7.30E-03	1.50E-03	2.60E-03	8.00E-04	7.74E-03	1.42E-03	5.88E-03
Ru-103	–	–	–	–	–	–	–	–	–	–	–
Ru-106	–	–	–	–	a/	–	2.50E+00	3.90E-01	2.17E+00	3.19E-01	2.34E+00
Sr-90	–	–	–	–	3.40E-01	8.50E-02	1.90E-01	3.70E-02	1.87E-01	3.82E-02	2.39E-01
Tc-99	–	–	–	–	< 2.30E-01	8.40E-01	2.10E+00	3.00E+00	6.03E-01	1.09E+00	9.78E-01
Zr-95	–	–	–	–	< -3.60E-02	4.10E-02	-5.60E-03	3.20E-02	1.80E-02	3.48E-02	-7.87E-03

Table A-2.4. Result of Grid Site Vegetation Sampling 1985-1989 (pCi/g).
Location GRT5

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Results
Be-7	–	–	–	–	–	–	–	–	2.82E+00	4.53E-01	2.82E+00
Ce-141	–	–	–	–	–	–	8.30E-03	1.60E-02	7.36E-03	4.07E-02	7.83E-03
Co-60	–	–	–	–	< 9.70E-03	1.50E-02	-2.70E-03	1.50E-02	-1.77E-02	2.23E-02	-3.57E-03
Cs-134	–	–	–	–	8.50E-02	1.90E-02	a/	–	–	–	8.50E-02
Cs-137	–	–	–	–	4.60E-01	5.60E-02	2.30E-01	3.30E-02	2.04E-01	3.82E-02	2.98E-01
Eu-152	–	–	–	–	< -8.20E-03	7.00E-02	-2.10E-02	5.80E-02	-1.30E-02	1.02E-01	-1.41E-02
Eu-154	–	–	–	–	< -3.30E-02	5.00E-02	-1.50E-02	4.80E-02	-2.51E-02	6.20E-02	-2.44E-02
Eu-155	–	–	–	–	< -3.20E-02	4.30E-02	2.00E-02	4.20E-02	-6.03E-02	6.44E-02	-2.41E-02
I-129	–	–	–	–	< -1.00E-01	2.80E-01	-9.20E-03	2.60E-01	6.63E-02	2.33E-01	-1.43E-02
K-40	–	–	–	–	–	–	–	–	1.29E+01	1.55E+00	1.29E+01
Nb-95	–	–	–	–	< 1.10E-02	2.10E-02	-5.50E-03	1.40E-02	4.98E-03	2.93E-02	3.49E-03
Pb-212	–	–	–	–	–	–	–	–	6.58E-02	3.42E-02	6.58E-02
Pb-214	–	–	–	–	–	–	–	–	5.77E-02	3.69E-02	5.77E-02
Pu-238	–	–	–	–	< 8.30E-05	9.80E-05	1.90E-04	2.60E-04	4.69E-04	2.84E-04	2.47E-04
Pu-239	–	–	–	–	4.00E-03	7.90E-04	2.30E-03	7.30E-04	2.42E-03	6.87E-04	2.91E-03
Ru-103	–	–	–	–	–	–	–	–	–	–	–
Ru-106	–	–	–	–	a/	–	4.60E-01	1.80E-01	–	–	4.60E-01
Sr-90	–	–	–	–	1.40E-01	3.70E-02	2.20E-01	4.20E-02	4.12E-01	7.91E-02	2.57E-01
Tc-99	–	–	–	–	< 2.10E-02	8.30E-01	2.00E+00	3.00E+00	1.74E+00	1.18E+00	1.25E+00
Zr-95	–	–	–	–	< -3.90E-03	2.90E-02	5.60E-03	2.40E-02	-2.31E-03	4.01E-02	-2.03E-04

Table A-2.4. Result of Grid Site Vegetation Sampling 1985-1989 (pCi/g).
Location GRT6

Radionuclide	1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Results
Be-7	--	--	--	--	--	--	--	--	2.09E+00	3.56E-01	2.09E+00
Ce-141	--	--	--	--	--	--	-5.10E-03	1.90E-02	4.61E-03	2.99E-02	-2.54E-04
Co-60	--	--	--	--	< 1.10E-02	1.50E-02	2.40E-03	1.70E-02	4.45E-03	1.86E-02	5.95E-03
Cs-134	--	--	--	--	8.00E-02	2.10E-02	3.10E-02	1.40E-02	--	--	5.55E-02
Cs-137	--	--	--	--	4.90E-01	5.90E-02	4.00E-01	5.10E-02	4.10E-01	5.69E-02	4.33E-01
Eu-152	--	--	--	--	< 1.00E-02	7.10E-02	-2.20E-02	7.00E-02	9.45E-02	8.75E-02	2.75E-02
Eu-154	--	--	--	--	< -3.70E-02	5.40E-02	1.40E-02	4.90E-02	-3.45E-02	6.40E-02	-1.92E-02
Eu-155	--	--	--	--	< 0.00E+00	3.80E-02	2.90E-02	4.60E-02	-7.63E-03	4.07E-02	7.12E-03
I-129	--	--	--	--	< 1.70E-01	3.70E-01	9.20E-03	2.60E-01	1.79E-01	1.68E-01	1.19E-01
K-40	--	--	--	--	--	--	--	--	1.10E+01	1.35E+00	1.10E+01
Nb-95	--	--	--	--	< 1.90E-02	2.80E-02	-1.40E-02	1.50E-02	-1.92E-02	2.85E-02	-4.73E-03
Pb-212	--	--	--	--	--	--	--	--	5.95E-02	3.52E-02	5.95E-02
Pb-214	--	--	--	--	--	--	--	--	7.84E-02	4.78E-02	7.84E-02
Pu-238	--	--	--	--	< -1.50E-06	8.10E-04	-3.90E-05	1.90E-04	1.75E-04	1.72E-04	4.48E-05
Pu-239	--	--	--	--	9.40E-03	3.50E-03	6.70E-03	1.30E-03	6.95E-03	1.33E-03	7.68E-03
Ru-103	--	--	--	--	--	--	--	--	--	--	--
Ru-106	--	--	--	--	a/	--	5.10E-01	1.70E-01	3.37E-01	1.85E-01	4.24E-01
Sr-90	--	--	--	--	2.40E-01	6.00E-02	2.70E-01	5.00E-02	5.04E-01	1.02E-01	3.38E-01
Tc-99	--	--	--	--	< 6.40E-01	8.60E-01	1.40E+00	3.00E+00	8.79E-01	1.11E+00	9.79E-01
Zr-95	--	--	--	--	< 3.70E-02	3.30E-02	-4.80E-03	2.50E-02	-1.54E-02	3.79E-02	5.60E-03

Source: Schmidt et al. 1990; Elder et al. 1986, 1987, 1988, 1989.
Negative values indicate concentrations at or near background levels of radioactivity.
Shaded areas indicate a positive detection, the result is larger than the errer.
Dashes indicate no data are available.
An asterisk indicates that radionuclide concentration is less than detectable. The detection limits are as follows: Co-60 = 3.0E-02, Sr-90 = 5.0E-03, Nb-95 = 5.0E-02, Zr-95 = 5.0E-02, Ru-103 = 3.0E-02, Ru-106 = 2.6E-01, Cs-137 = 3.0E-02, Eu-152 = 1.7E-01, Er-154 = 8.0E-02, Eu-155 = 7.0E-02, Pu-238 = 6.0E-04, Pu-239 = 6.0E-04.
a/ Not routinely reported.
b/ Not analyzed for this radionuclide.

Table A-2.5. Results of Vegetation Sampling for 1990 and 1991 (pCi/g).
Location 67

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	--	--	-3.00E+00	1.40E+01	3.00E+00
CePr-144	--	--	-2.00E+00	2.00E+00	2.00E+00
Co-60	--	--	3.70E-01	2.10E-01	3.70E-01
Cs-134	--	--	1.60E-01	1.80E-01	1.60E-01
Cs-137	--	--	4.10E-01	1.80E-01	4.10E-01
Eu-154	--	--	3.70E-01	5.20E-01	3.70E-01
Eu-155	--	--	8.30E-02	3.90E-01	8.30E-02
K-40	--	--	2.70E+01	6.40E+00	2.70E+01
Pb-212	--	--	--	--	--
Pb-214	--	--	--	--	--
Pu-238	--	--	4.05E-05	2.90E-04	4.05E-05
Pu-239/240	--	--	8.00E-04	5.50E-04	8.00E-04
Ru-106	--	--	-1.60E+00	2.00E+00	1.60E+00
Sb-125	--	--	-1.00E-02	4.20E-01	1.00E-02
Sr-90	--	--	3.80E-01	8.10E-02	3.80E-01
U-234	--	--	9.00E-02	1.70E-02	9.00E-02
U-235	--	--	3.70E-04	2.60E-03	3.70E-04
U-238	--	--	2.40E-02	7.60E-03	2.40E-02
U (Total)	--	--	--	--	--
Zn-65	--	--	-5.20E-01	6.10E-01	5.20E-01
ZrNb-95	--	--	-3.50E-01	2.10E+00	3.50E-01

Table A-2.5. Results of Vegetation Sampling for 1990 and 1991 (pCi/g).
Location 78

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	9.96E+00	1.19E+01	-4.10E+00	6.70E+00	7.03E+00
CePr-144	8.16E-02	3.04E-01	-2.30E-01	7.80E-01	1.56E-01
Co-60	-9.40E-03	1.76E-02	1.80E-02	6.10E-02	1.37E-02
Cs-134	-3.54E-02	2.07E-00	-9.10E-03	5.50E-02	2.23E-02
Cs-137	7.67E-02	2.14E-02	2.90E-01	8.40E-02	1.83E-01
Eu-154	-2.24E-02	5.88E-02	1.30E-01	1.60E-01	7.62E-02
Eu-155	3.89E-03	5.06E-02	1.10E-02	1.60E-01	7.45E-03
K-40	1.60E+01	1.74E+00	1.20E+01	2.00E+00	1.40E+01
Pb-212	3.66E-02	2.23E-02	--	--	3.66E-02
Pb-214	*	--	--	--	--
Pu-238	1.65E-04	1.30E-04	4.60E+05	1.00E+04	1.06E+04
Pu-239/240	9.32E-03	1.30E-03	9.90E-04	3.10E-04	5.16E-03
Ru-106	8.69E-03	2.55E-01	-1.90E-01	6.50E-01	9.93E-02
Sb-125	-2.08E-02	4.49E-02	4.60E-02	1.60E-01	3.34E-02
Sr-90	1.54E-02	4.74E-03	3.60E-02	1.00E-02	2.57E-02
U-234	--	--	1.80E-02	5.70E-03	1.80E-02
U-235	--	--	-5.60E-04	1.60E-03	5.60E-04
U-238	--	--	1.00E-02	4.10E-03	1.00E-02
U (Total)	4.53E-02	1.43E-02	--	--	4.53E-02
Zn-65	-1.44E-01	1.45E-01	-6.70E-03	2.50E-01	7.54E-02
ZrNb-95	3.21E-01	1.52E+00	1.80E-01	1.10E+00	2.51E-01

Table A-2.5. Results of Vegetation Sampling for 1990 and 1991 (pCi/g).
Location 79

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	--	--	1.80E+00	6.80E+00	1.80E+00
CePr-144	--	--	1.40E-01	1.10E+00	1.40E-01
Co-60	--	--	6.80E-02	7.90E-02	6.80E-02
Cs-134	--	--	-1.10E-01	9.00E-02	1.10E-01
Cs-137	--	--	-7.00E-02	9.20E-02	7.00E-02
Eu-154	--	--	1.80E-01	2.60E-01	1.80E-01
Eu-155	--	--	2.80E-02	2.30E-01	2.80E-02
K-40	--	--	2.90E+01	4.00E+00	2.90E+01
Pb-212	--	--	--	--	--
Pb-214	--	--	--	--	--
Pu-238	--	--	9.20E-05	1.10E-04	9.20E-05
Pu-239/240	--	--	1.90E-03	4.30E-04	1.90E-03
Ru-106	--	--	-1.10E+00	1.10E+00	1.10E+00
Sb-125	--	--	-1.10E-01	2.20E-01	1.10E-01
Sr-90	--	--	1.30E-01	2.70E-02	1.30E-01
U-234	--	--	5.90E-02	1.10E-02	5.90E-02
U-235	--	--	3.40E-04	1.90E-03	3.40E-04
U-238	--	--	2.10E-02	6.30E-03	2.10E-02
U (Total)	--	--	--	--	--
Zn-65	--	--	-3.50E-01	3.50E-01	3.50E-01
ZrNb-95	--	--	9.80E-01	1.00E+00	9.80E-01

Source: Schmidt et al. 1992.

Negative values indicate concentrations at or near background levels of radioactivity.

Shaded areas indicate a positive detection, the result is greater than the error.

Dashes indicate no data are available.

The detection limits are as follows: Mn-54 = 2.0E-02, Co-58 = 2.0E-02, Co-60 = 2.0E-02, Zn-65 = 4.0E-02, Sr-90 = 5.0E-03, Nb-95 = 3.0E-02, Zr-95 = 3.0E-02, Ru-106 = 1.7E-01, Cs-134 = 2.0E-02, Cs-137 = 2.0E-02, Eu-152 = 1.1E-01, Eu-154 = 5.0E-02, Eu-155 = 5.0E-02, Pu-238 = 6.0E-04, Pu-239 = 6.0E-04, and U (Total) = 1.0E-02.

Table A-2.6. Results of Air Monitoring 1955 - 1989 (pCi/m³)
Location N006

Radionuclide		1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Result
Sr-90	max	–	–	–	–	–	–	2.9E-04	1.3E-04	2.92E-04	1.46E-04	2.91E-04
	min	–	–	–	–	–	–	< 5.8E-05	7.3E-05	-0.00000	8.46E-05	2.90E-05
	avg	–	–	–	–	–	–	1.5E-04	1.1E-04	1.42E-04	1.15E-04	1.46E-04
Cs-137	max	–	–	–	–	–	–	7.1E-04	5.2E-04	4.07E-04	7.68E-04	5.59E-04
	min	–	–	–	–	–	–	3.0E-05	6.4E-04	-1.21E-04	4.82E-04	-4.55E-04
	avg	–	–	–	–	–	–	3.8E-04	3.1E-04	1.43E-04	6.25E-04	2.62E-04
Pu-239	max	–	–	–	–	–	–	1.8E-05	9.9E-06	1.06E-05	5.00E-06	1.43E-05
	min	–	–	–	–	–	–	< 9.9E-07	1.8E-06	1.50E-06	3.48E-06	1.25E-06
	avg	–	–	–	–	–	–	6.5E-06	8.9E-06	6.05E-06	4.24E-06	6.28E-06
U(total)	max	–	–	–	–	–	–	-9.6E-07	1.9E-06	5.48E-06	2.84E-05	2.26E-06
	min	–	–	–	–	–	–	-1.2E-05	3.0E-05	3.02E-06	1.97E-05	-4.49E-06
	avg	–	–	–	–	–	–	-6.1E-06	7.4E-06	4.25E-06	2.41E-05	-9.25E-07

Table A-2.6. Results of Air Monitoring 1955 - 1989 (pCi/m^3)
Location N007

		1985		1986		1987		1988		1989		Average Result
Radionuclide		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	
Sr-90	max	–	–	–	–	–	–	3.9E-04	1.5E-04	1.31E-04	9.62E-05	2.61E-04
	min	–	–	–	–	–	–	< 2.0E-05	6.9E-05	-0.00003	7.04E-05	-5.00E-06
	avg	–	–	–	–	–	–	1.9E-04	1.6E-04	4.73E-05	8.33E-05	1.19E-04
Cs-137	max	–	–	–	–	–	–	< 8.4E-04	1.1E-03	9.64E-05	4.67E-04	4.68E-04
	min	–	–	–	–	–	–	< -9.6E-05	4.0E-04	-4.97E-05	7.98E-04	-7.29E-05
	avg	–	–	–	–	–	–	2.1E-04	5.3E-04	2.33E-04	6.33E-04	1.17E-04
Pu-239	max	–	–	–	–	–	–	1.2E-05	7.9E-06	1.54E-06	2.99E-06	6.77E-06
	min	–	–	–	–	–	–	< 1.3E-06	2.6E-06	-0.00000	1.34E-06	6.50E-07
	avg	–	–	–	–	–	–	4.2E-06	6.2E-06	7.25E-07	2.17E-06	2.46E-06
U(total)	max	–	–	–	–	–	–	3.5E-05	3.3E-05	1.13E-05	2.12E-05	2.32E-05
	min	–	–	–	–	–	–	< -1.0E-05	3.0E-05	-0.00000	2.47E-05	-5.00E-06
	avg	–	–	–	–	–	–	7.9E-06	2.1E-05	5.50E-06	2.30E-05	6.70E-06

Table A-2.6. Results of Air Monitoring 1955 - 1989 (pCi/m³)
Location N008

		1985		1986		1987		1988		1989		Average Result
Radionuclide		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	
Sr-90	max	--	--	--	--	--	--	4.0E-04	1.5E-04	1.44E-04	8.85E-05	2.72E-04
	min	--	--	--	--	--	--	< 3.9E-05	1.3E-04	-0.00000	7.75E-05	1.95E-05
	avg	--	--	--	--	--	--	1.5E-04	1.7E-04	6.96E-05	8.30E-05	1.10E-04
Cs-137	max	--	--	--	--	--	--	< 2.6E-04	7.1E-04	6.03E-04	3.86E-04	4.32E-04
	min	--	--	--	--	--	--	< -3.0E-04	9.3E-04	-1.63E-04	6.05E-04	-2.32E-04
	avg	--	--	--	--	--	--	-4.9E-05	3.8E-04	2.20E-04	4.95E-04	8.55E-05
Pu-239	max	--	--	--	--	--	--	< 2.5E-06	2.8E-06	1.00E-05	4.65E-06	6.25E-06
	min	--	--	--	--	--	--	< 1.9E-07	2.8E-06	6.56E-07	2.00E-06	4.23E-07
	avg	--	--	--	--	--	--	1.5E-06	3.2E-06	5.33E-06	3.33E-06	3.42E-06
U(total)	max	--	--	--	--	--	--	< 2.4E-05	2.8E-05	5.47E-05	2.92E-05	3.94E-05
	min	--	--	--	--	--	--	< -9.3E-06	1.8E-05	7.58E-06	2.57E-05	-8.60E-07
	avg	--	--	--	--	--	--	9.4E-06	1.6E-05	3.11E-05	2.75E-05	2.03E-05

Table A-2.6. Results of Air Monitoring 1955 - 1989 (pCi/m³)
Location N012

Radionuclide		1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Result
Sr-90	max	–	–	–	–	–	–	6.6E-04	2.2E-04	5.00E-05	7.26E-05	3.55E-04
	min	–	–	–	–	–	–	1.6E-04	1.3E-04	-0.00000	6.66E-05	8.00E-05
	avg	–	–	–	–	–	–	4.1E-04	5.1E-04	2.60E-05	6.41E-05	2.18E-04
Cs-137	max	–	–	–	–	–	–	< 8.9E-04	9.6E-04	7.97E-04	7.47E-04	8.44E-04
	min	–	–	–	–	–	–	5.9E-04	4.3E-04	5.44E-05	5.71E-04	3.22E-04
	avg	–	–	–	–	–	–	7.4E-04	6.1E-04	3.65E-04	6.17E-04	5.53E-04
Pu-239	max	–	–	–	–	–	–	4.5E-06	3.9E-06	3.36-06	3.06E-06	3.93E-06
	min	–	–	–	–	–	–	< 1.5E-06	4.8E-06	-0.00000	1.35E-06	7.50E-07
	avg	–	–	–	–	–	–	3.0E-06	3.2E-06	1.97E-06	2.64E-06	2.49E-06
U(total)	max	–	–	–	–	–	–	< -4.2E-06	1.8E-05	1.93E-05	1.35E-05	7.55E-06
	min	–	–	–	–	–	–	< -5.2E-05	3.7E-05	-0.00000	1.94E-05	-2.60E-05
	avg	–	–	–	–	–	–	-2.8E-05	5.1E-05	9.88E-06	1.92E-05	-9.06E-06

Table A-2.6. Results of Air Monitoring 1955 - 1989 (pCi/m³)
Location N158: 241-AX Tank Farm

		1985		1986		1987		1988		1989		Average Result
Radionuclide		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	
Sr-90	max	2.83E-03	–	4.19E-04	–	5.44E-04	–	6.7E-04	2.2E-04	1.24E-03	3.33E-04	1.14E-03
	min	3.00E-04	–	3.29E-04	–	1.49E-04	–	1.3E-04	8.9E-05	4.57E-05	8.70E-05	1.91E-04
	avg	1.57E-03	2.38E-03	3.81E-04	8.98E-05	3.55E-04	3.44E-04	3.5E-04	2.4E-04	3.78E-04	1.49E-04	6.07E-04
Cs-137	max	4.36E-03	–	5.57E-03	–	3.16E-03	–	1.7E-03	7.8E-04	1.93E-03	9.69E-04	3.34E-03
	min	1.29E-03	–	7.56E-04	–	2.81E-04	–	< 1.8E-04	5.5E-04	1.39E-04	6.71E-04	5.29E-04
	avg	2.37E-03	2.74E-03	2.42E-03	4.31E-03	1.64E-03	2.36E-03	1.2E-03	7.3E-04	9.45E-04	7.33E-04	1.72E-03
Pu-239	max	6.15E-05	–	1.83E-05	–	1.21E-05	–	3.0E-05	9.8E-06	2.37E-03	2.42E-04	4.98E-04
	min	2.64E-05	–	2.12E-06	–	3.56E-06	–	< -5.6E-07	5.0E-06	1.17E-06	2.03E-06	6.54E-06
	avg	4.64E-05	3.02E-05	9.72E-06	1.65E-05	6.56E-06	7.66E-06	1.1E-05	1.4E-06	5.95E-04	6.25E-05	1.34E-04
U(total)	max	1.64E-04	–	8.55E-05	–	3.50E-05	–	3.7E-05	2.7E-05	9.43E-05	3.48E-05	8.32E-05
	min	3.29E-05	–	2.21E-05	–	1.94E-05	–	< 4.2E-06	2.0E-05	-0.00000	1.88E-05	1.57E-05
	avg	1.03E-04	1.31E-04	4.80E-05	5.80E-05	2.63E-06	1.31E-05	1.7E-05	1.5E-05	3.85E-05	2.42E-05	4.18E-05

Table A-2.6. Results of Air Monitoring 1955 - 1989 (pCi/m³)
Location N969: SW of PUREX Plant

		1985		1986		1987		1988		1989		Average Result
Radionuclide		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	
Sr-90	max	1.26E-03	--	7.96E-04	--	2.37E-04	--	3.0E-04	1.3E-04	1.30E-03	3.63E-04	7.79E-04
	min	1.45E-04	--	9.74E-05	--	1.28E-05	--	< 1.3E-05	6.5E-05	2.85E-05	6.42E-05	5.93E-05
	avg	6.06E-04	1.05E-03	3.75E-04	5.95E-04	9.22E-05	2.45E-04	1.5E-04	1.6E-04	3.78E-04	1.47E-04	3.20E-04
Cs-137	max	5.45E-04	--	1.54E-03	--	-5.06E-05	--	< 2.0E-04	6.9E-04	2.50E-04	5.21E-04	4.97E-04
	min	-8.10E-04	--	2.45E-05	--	-4.33E-04	--	< -1.0E-04	5.8E-04	-3.05E-05	6.27E-04	-2.70E-04
	avg	-3.27E-05	1.13E-03	7.06E-04	1.26E-03	-2.56E-04	3.31E-04	8.9E-04	1.8E-04	1.46E-04	6.23E-04	1.30E-04
Pu-239	max	1.57E-04	--	2.37E-05	--	9.10E-06	--	5.5E-05	1.2E-05	9.72E-06	5.01E-06	5.09E-05
	min	5.65E-05	--	6.04E-06	--	6.29E-07	--	< 1.1E-06	2.5E-06	4.64E-07	1.55E-06	1.29E-05
	avg	9.01E-05	9.13E-05	1.62E-05	1.71E-05	4.82E-06	7.19E-06	1.9E-05	2.5E-05	3.53E-06	2.80E-06	2.67E-05
U(total)	max	8.75E-04	--	9.79E-05	--	3.69E-05	--	5.6E-05	3.1E-05	4.44E-05	2.07E-05	2.18E-04
	min	2.91E-05	--	1.83E-05	--	4.37E-06	--	< -1.2E-07	1.9E-05	2.07E-06	2.05E-05	1.07E-05
	avg	2.59E-04	8.01E-04	5.94E-05	7.04E-05	2.47E-05	2.86E-05	3.3E-05	2.5E-05	2.19E-05	1.99E-05	7.96E-05

Table A-2.6. Results of Air Monitoring 1955 - 1989 (pCi/m³)
Location N970

		1985		1986		1987		1988		1989		Average Result
Radionuclide		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	
Sr-90	max	1.85E-03	--	2.31E-04	--	2.80E-04	--	2.5E-04	1.3E-04	9.79E-05	7.94E-05	5.42E-04
	min	9.94E-05	--	1.32E-04	--	-2.26E-05	--	1.1E-04	1.1E-04	-0.00003	5.70E-05	5.78E-05
	avg	6.11E-04	1.66E-03	1.81E-04	8.60E-05	8.76E-05	2.74E-04	1.7E-04	7.2E-05	5.45E-05	7.18E-05	2.21E-04
Cs-137	max	4.70E-04	--	4.72E-03	--	3.82E-04	--	3.9E-04	4.6E-04	4.78E-04	5.50E-04	1.29E-03
	min	-7.12E-04	--	5.42E-04	--	0.00E+00	--	< -3.0E-04	5.9E-04	-2.74E-04	5.85E-04	-1.49E-04
	avg	7.03E-05	1.08E-03	1.97E-03	3.92E-03	1.60E-04	3.41E-04	4.8E-05	3.3E-04	1.14E-04	6.12E-04	4.72E-04
Pu-239	max	1.71E-04	--	7.17E-05	--	1.25E-05	--	4.9E-05	1.2E-05	4.45E-05	1.07E-05	6.97E-05
	min	4.95E-05	--	5.59E-06	--	3.04E-06	--	1.3E-05	5.7E-06	1.04E-06	2.67E-06	1.44E-05
	avg	8.73E-05	1.13E-04	2.92E-05	5.87E-05	7.70E-06	8.88E-06	3.1E-05	1.5E-05	1.80E-05	5.97E-06	3.46E-05
U(total)	max	1.59E-04	--	3.91E-04	--	4.08E-05	--	4.0E-05	2.7E-05	4.67E-05	2.06E-05	1.36E-04
	min	4.62E-05	--	3.14E-05	--	1.07E-05	--	< -1.7E-06	1.9E-05	1.28E-05	2.15E-05	1.99E-05
	avg	9.72E-05	9.50E-05	1.40E-04	3.38E-04	2.28E-05	2.72E-05	2.0E-05	1.7E-05	2.94E-05	2.11E-05	6.10E-05

Table A-2.6. Results of Air Monitoring 1955 - 1989 (pCi/m³)
Location N971

		1985		1986		1987		1988		1989		Average Result
Radionuclide		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	
Sr-90	max	1.48E-02	--	5.44E-04	--	4.20E-04	--	2.7E-04	1.2E-04	7.50E-04	2.41E-04	3.21E-03
	min	2.81E-04	--	1.29E-04	--	2.30E-05	--	1.2E-04	1.1E-04	1.49E-05	6.12E-05	1.71E-04
	avg	4.18E-03	1.42E-02	3.18E-04	3.77E-04	1.35E-04	3.82E-04	1.9E-04	6.7E-05	3.03E-04	1.31E-04	9.65E-04
Cs-137	max	7.65E-04	--	1.41E-03	--	6.94E-04	--	7.0E-04	6.2E-04	6.35E-04	3.88E-04	5.77E-04
	min	0.00E+00	--	-7.63E-04	--	2.35E-04	--	< 5.8E-05	5.5E-04	-6.86E-04	5.58E-04	-1.07E-04
	avg	3.06E-04	6.52E-04	5.58E-04	1.87E-03	5.43E-04	4.16E-04	3.9E-04	3.2E-04	-6.52E-05	5.14E-04	3.59E-04
Pu-239	max	1.73E-04	--	1.58E-04	--	1.35E-05	--	3.1E-05	8.4E-06	1.76E-04	2.52E-05	7.52E-05
	min	7.17E-05	--	1.60E-05	--	3.57E-06	--	8.0E-06	4.8E-06	4.29E-07	1.66E-06	2.89E-05
	avg	1.20E-04	9.48E-05	5.55E-05	1.37E-04	6.54E-06	9.45E-06	2.2E-05	1.0E-05	4.52E-05	7.84E-06	4.08E-05
U(total)	max	1.14E-04	--	8.08E-05	--	3.02E-05	--	< 2.4E-05	2.5E-05	7.16E-05	2.79E-05	5.18E-05
	min	3.76E-05	--	1.49E-05	--	1.03E-05	--	< -7.4E-06	1.8E-05	1.01E-05	2.14E-05	1.85E-05
	avg	6.77E-05	6.96E-05	3.93E-05	5.77E-05	2.01E-05	1.66E-05	7.4E-06	1.3E-05	3.72E-05	2.34E-05	2.69E-05

Table A-2.6. Results of Air Monitoring 1955 - 1989 (pCi/m^3)
Location N976

		1985		1986		1987		1988		1989		Average Result
Radionuclide		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	
Sr-90	max	6.23E-03	--	1.19E-01	--	2.98E-04	--	5.0E-04	2.0E-04	4.36E-04	1.74E-04	2.53E-02
	min	5.51E-04	--	5.20E-04	--	1.46E-04	--	1.7E-04	1.2E-04	3.56E-05	8.79E-05	2.85E-04
	avg	2.50E-03	5.30E-03	6.27E-04	1.87E-04	2.51E-04	1.41E-04	2.9E-04	1.5E-04	2.08E-04	1.16E-04	7.75E-04
Cs-137	max	5.67E-04	--	1.81E-03	--	5.54E-04	--	< 1.7E-04	6.0E-04	7.00E-04	6.20E-04	7.60E-04
	min	-4.59E-04	--	3.43E-04	--	2.06E-04	--	<-1.1E-04	5.3E-04	-2.28E-04	5.41E-04	-4.96E-05
	avg	2.04E-04	9.39E-04	7.82E-04	1.38E-03	4.07E-04	3.02E-04	-3.0E-07	1.5E-04	2.39E-04	5.51E-04	3.26E-04
Pu-239	max	2.91E-05	--	4.99E-06	--	6.83E-06	--	< 5.5E-07	1.6E-06	1.99E-06	2.97E-06	8.69E-06
	min	1.36E-05	--	6.81E-07	--	1.90E-06	--	< -1.7E-06	1.6E-06	-0.00000	3.28E-06	2.90E-06
	avg	1.94E-05	1.39E-05	3.64E-06	4.03E-06	3.88E-06	4.21E-06	-1.3E-07	1.1E-06	2.44E-07	2.25E-06	5.41E-06
U(total)	max	1.17E-04	--	4.83E-05	--	6.01E-05	--	< 9.9E-06	2.0E-05	2.21E-04	7.04E-05	9.13E-05
	min	1.97E-05	--	3.25E-05	--	1.65E-05	--	< -8.3E-07	1.9E-05	-0.00000	1.86E-05	1.36E-05
	avg	7.21E-05	8.89E-05	3.79E-05	1.43E-05	3.39E-05	3.71E-05	4.5E-06	4.7E-06	8.57E-05	3.73E-05	4.68E-05

Table A-2.6. Results of Air Monitoring 1955 - 1989 (pCi/m³)
Location N977

		1985		1986		1987		1988		1989		Average Result
Radionuclide		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	
Sr-90	max	5.88E-03	--	3.51E-04	--	2.90E-04	--	2.7E-04	1.4E-04	1.07E-04	9.90E-05	1.38E-03
	min	4.78E-04	--	2.14E-04	--	3.62E-05	--	1.1E-04	1.0E-04	-0.00003	1.07E-04	1.68E-04
	avg	2.08E-03	5.14E-03	2.86E-04	1.41E-04	1.23E-04	2.28E-04	1.9E-04	9.1E-05	2.19E-05	9.31E-05	5.40E-04
Cs-137	max	1.00E-03	--	8.76E-04	--	7.03E-04	--	8.5E-04	6.3E-04	3.69E-04	4.77E-04	7.60E-04
	min	1.05E-04	--	-3.73E-04	--	3.91E-04	--	< -1.1E-04	5.1E-04	-3.78E-04	6.14E-04	-7.48E-05
	avg	5.02E-04	8.08E-04	2.75E-04	1.23E-03	5.51E-04	2.57E-04	2.7E-04	4.7E-04	-6.22E-05	5.43E-04	3.07E-04
Pu-239	max	1.13E-04	--	2.39E-05	--	7.66E-06	--	4.4E-05	1.3E-05	6.83E-06	4.18E-06	3.91E-05
	min	3.20E-05	--	5.10E-06	--	5.31E-07	--	3.9E-06	3.2E-06	2.48E-07	1.64E-06	8.36E-06
	avg	7.29E-05	6.90E-05	1.24E-05	1.62E-05	3.56E-06	7.39E-06	1.5E-05	2.0E-05	2.61E-06	2.46E-06	2.13E-05
U(total)	max	1.61E-04	--	4.77E-05	--	4.27E-05	--	< 1.1E-05	2.3E-05	1.27E-04	4.35E-05	7.79E-05
	min	4.30E-05	--	1.20E-05	--	1.03E-05	--	< -4.3E-06	2.0E-05	9.56E-06	2.10E-05	1.41E-05
	avg	8.27E-05	1.07E-04	2.76E-05	3.31E-05	2.41E-05	2.95E-05	1.6E-06	7.6E-06	6.31E-05	3.04E-05	3.98E-05

Table A-2.6. Results of Air Monitoring 1955 - 1989 (pCi/m³)
Location N984

		1985		1986		1987		1988		1989		Average Result
Radionuclide		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	
Sr-90	max	2.71E-03	--	9.80E-04	--	7.88E-03	--	8.0E-04	2.6E-04	5.68E-04	2.15E-04	2.59E-03
	min	2.07E-04	--	2.73E-04	--	1.18E-04	--	2.7E-04	1.3E-04	2.01E-05	7.41E-05	1.78E-04
	avg	1.29E-03	2.15E-03	5.74E-04	6.95E-04	2.11E-03	7.70E-03	4.2E-04	2.6E-04	2.61E-04	1.40E-04	9.31E-04
Cs-137	max	3.79E-03	--	2.95E-03	--	3.12E-03	--	1.9E-03	7.8E-04	7.41E-04	4.53E-04	2.50E-03
	min	1.35E-04	--	-1.27E-04	--	4.48E-04	--	6.9E-04	4.8E-04	3.50E-04	7.40E-04	2.99E-04
	avg	2.32E-03	3.52E-03	1.37E-03	3.23E-03	1.58E-03	2.23E-03	1.1E-03	5.8E-04	5.89E-04	6.43E-04	1.39E-03
Pu-239	max	3.49E-05	--	6.60E-06	--	3.43E-06	--	5.6E-06	4.0E-06	4.17E-05	1.05E-05	1.84E-05
	min	1.51E-05	--	4.24E-06	--	6.76E-07	--	< 4.2E-07	2.0E-06	4.01E-06	4.34E-06	4.89E-06
	avg	2.29E-05	1.72E-05	5.24E-06	2.35E-06	2.12E-06	2.44E-06	2.6E-06	2.5E-06	1.48E-05	5.85E-06	9.53E-06
U(total)	max	1.46E-04	--	5.76E-05	--	1.51E-05	--	< 8.7E-07	1.9E-05	7.71E-05	3.03E-05	5.93E-05
	min	2.65E-05	--	2.19E-05	--	6.76E-06	--	< -5.6E-06	1.9E-05	-0.00000	2.00E-05	9.91E-06
	avg	7.93E-05	1.11E-04	3.94E-05	2.95E-05	1.11E-05	7.09E-06	-1.7E-06	2.9E-06	4.25E-05	2.58E-05	3.41E-05

Table A-2.6. Results of Air Monitoring 1955 - 1989 (pCi/m³)
Location N985

Radionuclide		1985 Result	1985 Error	1986 Result	1986 Error	1987 Result	1987 Error	1988 Result	1988 Error	1989 Result	1989 Error	Average Result
Sr-90	max	1.02E-03	--	8.29E-04	--	5.48E-04	--	2.9E-04	1.3E-04	2.63E-04	1.16E-04	5.90E-04
	min	3.81E-04	--	3.37E-04	--	1.43E-04	--	<7.5E-05	8.1E-05	-0.00002	8.00E-05	1.87E-04
	avg	6.91E-04	6.40E-04	5.71E-04	4.16E-04	3.19E-04	3.43E-04	1.5E-04	1.0E-04	1.20E-04	9.46E-05	3.70E-04
Cs-137	max	9.62E-04	--	1.28E-03	--	4.08E-04	--	4.4E-04	4.2E-04	5.94E-04	5.28E-04	7.37E-04
	min	7.34E-04	--	5.52E-04	--	-3.02E-04	--	<-8.5E-05	6.9E-04	-1.52E-04	5.22E-04	1.49E-04
	avg	8.81E-04	2.55E-04	9.44E-04	6.96E-04	6.85E-05	7.43E-04	1.4E-05	2.8E-04	1.24E-04	5.94E-04	4.32E-04
Pu-239	max	4.68E-05	--	2.53E-05	--	5.28E-06	--	1.0E-04	2.1E-05	4.16E-04	5.56E-05	1.19E-04
	min	2.27E-05	--	1.44E-06	--	9.41E-07	--	<2.7E-06	3.8E-06	9.13E-07	1.73E-06	5.74E-06
	avg	3.70E-05	2.53E-05	1.54E-05	2.30E-05	3.15E-06	3.63E-06	3.3E-05	4.9E-05	1.05E-04	1.57E-05	3.87E-05
U(total)	max	2.20E-04	--	9.40E-05	--	3.14E-05	--	<2.4E-05	2.4E-05	7.65E-05	2.83E-05	8.92E-05
	min	2.52E-05	--	1.75E-05	--	1.34E-05	--	<2.4E-06	2.0E-05	2.61E-05	2.41E-05	1.69E-05
	avg	1.23E-04	1.95E-04	4.33E-05	6.88E-05	2.32E-05	1.48E-05	1.3E-05	9.7E-06	4.48E-05	2.48E-05	4.95E-05

Table A-2.6. Results of Air Monitoring 1955 - 1989 (pCi/m³)
Location N991

		1985		1986		1987		1988		1989		Average Result
Radionuclide		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	
Sr-90	max	1.56E-04	--	2.72E-04	--	1.05E-04	--	2.6E-04	1.2E-04	1.26E-04	8.37E-05	1.84E-04
	min	8.36E-05	--	1.50E-04	--	-8.84E-06	--	<2.1E-06	9.2E-05	1.94E-05	9.59E-05	4.93E-05
	avg	1.20E-04	1.02E-04	2.05E-04	1.10E-04	5.31E-05	9.64E-05	1.3E-04	1.1E-04	7.67E-05	8.69E-05	1.17E-04
Cs-137	max	8.58E-04	--	7.12E-04	--	4.85E-04	--	<6.8E-04	8.3E-04	3.97E-04	5.51E-04	6.21E-04
	min	2.73E-05	--	2.49E-04	--	-1.13E-05	--	<8.7E-05	6.8E-04	-1.93E-04	4.70E-04	3.18E-05
	avg	4.43E-04	1.17E-03	4.40E-04	4.46E-04	2.55E-04	3.91E-04	2.7E-04	3.2E-04	1.09E-04	5.50E-04	3.03E-04
Pu-239	max	5.47E-05	--	2.70E-05	--	3.64E-06	--	1.1E-05	6.0E-06	3.94E-05	1.03E-05	2.71E-05
	min	3.31E-05	--	1.59E-06	--	4.66E-08	--	<1.7E-06	2.6E-06	6.86E-07	1.50E-06	7.42E-06
	avg	4.39E-05	3.05E-05	1.24E-05	2.20E-05	1.62E-06	3.02E-06	6.3E-06	4.5E-06	1.07E-05	3.86E-06	1.50E-05
U(total)	max	2.00E-04	--	6.60E-05	--	2.84E-06	--	<1.1E-05	2.1E-05	5.57E-05	2.25E-05	6.71E-05
	min	3.04E-05	--	1.54E-05	--	1.23E-06	--	<-8.7E-06	2.0E-05	8.70E-07	1.98E-05	7.84E-06
	avg	1.15E-04	2.40E-04	4.43E-05	4.44E-05	1.35E-05	2.24E-05	1.5E-06	8.3E-06	2.41E-05	1.97E-05	3.97E-05

Table A-2.6. Results of Air Monitoring 1955 - 1989 (pCi/m³)
Location N992

		1985		1986		1987		1988		1989		Average Result
Radionuclide		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	
Sr-90	max	2.78E-04	--	2.78E-04	--	1.33E-04	--	--	--	6.02E-04	2.07E-04	2.58E-04
	min	2.78E-04	--	5.04E-05	--	3.79E-05	--	--	--	-0.00003	6.14E-05	7.33E-05
	avg	2.78E-04	2.50E-04	1.60E-04	1.86E-04	8.52E-05	8.78E-05	2.7E-04	1.5E-04	1.52E-04	1.03E-04	1.89E-04
Cs-137	max	-7.08E-04	--	1.15E-03	--	8.88E-04	--	--	--	4.09E-04	4.70E-04	3.48E-04
	min	-7.08E-04	--	-1.88E-04	--	-7.54E-04	--	--	--	-6.66E-05	4.73E-04	-3.43E-04
	avg	-7.08E-04	9.87E-04	5.06E-04	1.21E-03	1.87E-04	1.64E-03	<4.5E-04	5.4E-04	1.73E-04	4.77E-04	1.22E-04
Pu-239	max	0.00E+00	--	9.23E-06	--	3.65E-06	--	--	--	8.20E-07	1.77E-06	2.74E-06
	min	0.00E+00	--	1.04E-06	--	7.38E-07	--	--	--	-0.00000	2.26E-06	3.56E-07
	avg	0.00E+00	3.80E-06	6.29E-06	7.64E-06	2.10E-06	2.64E-06	<5.4E-07	1.8E-06	-0.00000	1.66E-06	1.79E-06
U(total)	max	2.03E-05	--	6.71E-05	--	2.06E-05	--	--	--	3.39E-05	1.66E-05	2.84E-05
	min	2.03E-05	--	1.67E-05	--	-1.77E-05	--	--	--	-0.00000	1.90E-05	3.86E-06
	avg	2.03E-05	3.36E-05	4.23E-05	4.40E-05	8.62E-06	3.57E-05	<1.3E-05	2.5E-05	2.09E-05	1.85E-05	2.10E-05

Table A-2.6. Results of Air Monitoring 1955 - 1989 (pCi/m³)
Location N993

		1985		1986		1987		1988		1989		Average Result
Radionuclide		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	
Sr-90	max	1.05E-04	--	4.33E-04	--	1.66E-04	--	3.2E-04	1.4E-04	3.71E-04	1.45E-04	2.79E-04
	min	1.05E-04	--	1.38E-04	--	4.28E-05	--	<2.6E-05	9.5E-05	1.84E-05	7.23E-05	6.60E-05
	avg	1.05E-04	1.89E-04	3.04E-04	2.46E-04	1.02E-04	1.19E-04	1.7E-04	1.3E-04	1.33E-04	9.73E-05	1.63E-04
Cs-137	max	-5.45E-05	--	5.15E-03	--	1.28E-03	--	7.1E-04	6.3E-04	7.53E-04	5.89E-04	1.57E-03
	min	-5.45E-05	--	3.47E-04	--	-4.92E-06	--	<-9.7E-05	5.2E-04	-2.96E-04	5.75E-04	-2.99E-05
	avg	-5.45E-05	1.12E-03	2.31E-03	4.19E-03	8.65E-04	1.23E-03	3.2E-04	3.4E-04	2.76E-04	5.53E-04	7.43E-04
Pu-239	max	9.82E-07	--	3.26E-05	--	7.48E-06	--	8.0E-06	5.1E-06	4.19E-06	3.25E-06	1.07E-05
	min	9.82E-07	--	6.61E-06	--	3.05E-06	--	<1.5E-06	2.6E-06	1.29E-06	2.38E-06	2.69E-06
	avg	9.82E-07	1.97E-06	2.26E-05	2.36E-05	5.48E-06	4.53E-06	4.1E-06	3.2E-06	2.39E-06	2.58E-06	7.11E-06
U(total)	max	2.64E-05	--	2.16E-04	--	1.42E-04	--	4.5E-05	2.9E-05	9.30E-05	3.31E-05	1.04E-04
	min	2.64E-05	--	2.62E-05	--	2.46E-05	--	<9.9E-06	2.0E-05	7.65E-06	2.05E-05	1.90E-05
	avg	2.64E-05	3.45E-05	9.76E-05	1.69E-04	6.05E-05	1.10E-04	2.0E-05	1.8E-05	4.31E-05	2.43E-05	4.59E-05

Table A-2.6. Results of Air Monitoring 1955 - 1989 (pCi/m³)
Location N996

		1985		1986		1987		1988		1989		Average Result
Radionuclide		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	
Sr-90	max	–	–	1.39E-04	–	8.43E-04	–	4.7E-04	1.7E-04	2.81E-04	2.09E-04	4.33E-04
	min	–	–	1.39E-04	–	1.89E-05	–	<7.8E-05	1.1E-04	4.76E-05	9.69E-05	7.09E-05
	avg	–	–	1.39E-04	2.44E-12	2.72E-04	7.67E-04	2.3E-04	2.0E-04	1.59E-04	1.40E-04	
Cs-137	max	–	–	6.41E-04	–	4.64E-04	–	6.2E-04	5.0E-04	1.80E-04	5.99E-04	4.76E-04
	min	–	–	2.74E-04	–	-3.25E-04	–	<-5.3E-04	6.5E-04	-4.45E-04	9.45E-04	-2.57E-04
	avg	–	–	4.58E-04	5.19E-04	9.02E-05	8.03E-04	2.4E-04	5.3E-04	-8.53E-05	7.01E-04	
Pu-239	max	–	–	2.40E-05	–	1.95E-05	–	7.3E-06	6.9E-06	2.65E-06	5.49E-06	1.34E-05
	min	–	–	1.73E-05	–	1.98E-06	–	<-5.6E-07	1.7E-06	-0.00000	2.23E-06	4.68E-06
	avg	–	–	2.06E-05	9.48E-06	7.26E-06	1.66E-05	2.6E-06	4.2E-06	1.20E-06	3.33E-06	
U(total)	max	–	–	6.42E-05	–	7.40E-05	–	<1.0E-05	2.4E-05	7.99E-05	3.62E-05	5.70E-05
	min	–	–	4.08E-05	–	2.45E-05	–	<3.3E-06	2.0E-05	2.71E-05	2.73E-05	2.39E-05
	avg	–	–	5.25E-05	3.31E-05	4.14E-05	4.58E-05	6.7E-06	3.5E-06	4.59E-05	3.07E-05	3.66E-05

Table A-2.6. Results of Air Monitoring 1955 - 1989 (pCi/m^3)
Location N997

		1985		1986		1987		1988		1989		Average Result
Radionuclide		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	
Sr-90	max	--	--	1.35E-03	--	7.17E-04	--	2.2E-04	1.1E-04	1.41E-04	1.27E-04	6.07E-04
	min	--	--	6.48E-04	--	4.77E-05	--	<1.5E-05	7.2E-05	-0.00008	1.60E-04	1.78E-04
	avg	--	--	9.99E-04	9.93E-04	2.51E-04	6.25E-04	1.4E-04	9.7E-05	3.79E-05	2.77E-04	
Cs-137	max	--	--	2.31E-03	--	1.23E-03	--	<5.9E-04	6.9E-04	2.53E-03	3.27E-03	1.67E-03
	min	--	--	1.78E-03	--	-2.64E-04	--	<2.9E-04	4.7E-04	-3.69E-05	6.68E-04	4.42E-04
	avg	--	--	2.04E-03	7.50E-04	3.31E-04	1.30E-03	4.9E-04	1.7E-04	1.01E-03	1.66E-03	
Pu-239	max	--	--	3.09E-05	--	3.70E-05	--	<3.1E-06	3.3E-06	5.52E-06	3.99E-06	1.91E-05
	min	--	--	4.29E-06	--	1.44E-06	--	<-5.6E-07	2.8E-06	-0.00000	1.47E-05	1.29E-06
	avg	--	--	1.76E-05	3.76E-05	1.47E-05	3.22E-05	1.2E-06	2.2E-06	5.51E-07	7.47E-06	8.51E-06
U(total)	max	--	--	1.18E-04	--	2.51E-05	--	<3.5E-06	2.1E-05	1.61E-04	8.87E-05	7.69E-05
	min	--	--	2.40E-05	--	2.04E-06	--	<-5.1E-06	2.0E-05	-0.00001	6.01E-05	5.24E-06
	avg	--	--	7.10E-05	1.33E-04	1.31E-05	2.10E-06	-2.0E-05	4.9E-06	4.46E-05	5.69E-05	3.17E-05

Source: Schmidt et al. 1990; Elder et al. 1986, 1987, 1988, 1989.
Shaded Areas indicate a positive detection, the result is larger than the error.
Negative values indicate concentrations at or near background levels of radioactivity.
Dashes indicate no data are available.
An asterix indicates sites sampled one quarter only show the overall counting error rather than the standard deviation of the mean of quarterly composites. Only one reading was taken in 1988.

Table A-2.7. Results of Air Monitoring for 1990 (pCi/m³)

Radionuclide		Location N158		Location N969		Location N970		Location N972		Location N977	
		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
Sr-90	Quarter 1	4.57E-05	8.70E-05	2.85E-05	6.42E-05	9.79E-05	7.94E-05	1.07E-04	8.38E-05	-4.89E-05	7.12E-05
	Quarters 2-4	3.68E-04	2.20E-04	-5.98E-06	1.80E-05	2.55E-05	9.10E-05	1.15E-04	4.10E-05	8.25E-06	9.30E-05
	Average	2.07E-04	1.54E-04	1.13E-05	4.11E-05	6.17E-05	8.52E-05	1.11E-04	6.24E-05	-2.03E-05	8.21E-05
Cs-137	Quarter 1	1.39E-04	6.71E-04	2.50E-04	5.21E-04	-2.74E-04	5.85E-04	4.92E-04	4.37E-04	-3.87E-04	6.14E-04
	Quarters 2-4	2.65E-03	7.50E-04	5.34E-05	5.50E-04	3.44E-04	5.20E-04	6.02E-04	3.10E-04	-6.59E-05	5.00E-04
	Average	1.39E-03	7.11E-04	1.52E-04	5.36E-04	3.50E-05	5.53E-04	5.47E-04	3.74E-04	-2.26E-04	5.57E-04
Pu-239	Quarter 1	4.21E-06	2.89E-06	1.04E-06	2.19E-06	1.04E-06	2.67E-06	2.00E-06	2.91E-06	2.02E-06	2.08E-06
	Quarters 2-4	3.24E-06	4.90E-06	4.22E-06	4.80E-06	6.98E-06	2.90E-06	5.87E-06	0.00E+00	9.74E-06	6.40E-06
	Average	3.73E-06	3.90E-06	2.63E-06	3.50E-06	4.01E-06	2.79E-06	3.94E-06	1.46E-06	5.88E-06	4.24E-06
U (total)	Quarter 1	9.43E-05	3.48E-05	4.44E-05	2.07E-05	4.00E-05	1.92E-05	5.34E-05	2.39E-05	1.27E-04	4.35E-05
	Quarters 2-4	2.61E-05	8.30E-06	1.97E-05	4.00E-06	2.49E-05	4.40E-06	3.00E-05	9.80E-06	1.55E-05	7.80E-06
	Average	6.02E-05	2.16E-05	3.21E-05	1.24E-05	3.25E-05	1.18E-05	4.17E-05	1.69E-05	7.13E-05	2.57E-05

Table A-2.7. Results of Air Monitoring for 1990 (pCi/m³)

Radionuclide		Location N978		Location N984		Location N985		Location N991		Location N992	
		Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
Sr-90	Quarter 1	5.14E-05	8.98E-05	3.23E-04	1.32E-04	2.63E-04	1.16E-04	1.26E-04	8.37E-05	3.94E-07	6.08E-05
	Quarters 2-4	1.43E-05	2.00E-05	6.09E-04	6.90E-04	1.01E-04	1.80E-05	2.87E-05	6.10E-05	4.32E-05	9.90E-05
	Average	3.29E-05	5.49E-05	4.66E-04	4.11E-04	1.82E-04	6.70E-05	7.74E-05	7.24E-05	2.18E-05	7.99E-05
Cs-137	Quarter 1	-1.29E-04	4.79E-04	6.71E-04	8.58E-04	5.94E-04	5.28E-04	3.97E-04	5.51E-04	-6.66E-05	4.73E-04
	Quarters 2-4	1.11E-04	8.70E-04	1.13E-03	3.30E-04	3.01E-04	1.00E-04	2.38E-04	3.90E-04	5.79E-05	9.30E-04
	Average	-9.00E-06	6.75E-04	9.01E-04	5.94E-04	4.48E-04	3.14E-04	3.18E-04	4.71E-04	-4.35E-06	7.02E-04
Pu-239	Quarter 1	9.66E-06	4.56E-06	8.58E-06	4.74E-06	1.49E-06	2.31E-06	9.27E-07	1.42E-06	-3.19E-08	2.26E-06
	Quarters 2-4	5.87E-06	8.80E-06	9.65E-06	7.50E-06	3.50E-06	2.50E-06	9.22E-06	5.80E-06	9.72E-06	9.40E-06
	Average	7.77E-06	6.68E-06	9.12E-06	6.12E-06	2.50E-06	2.41E-06	5.07E-06	3.61E-06	4.84E-06	5.83E-06
U (total)	Quarter 1	9.77E-05	3.63E-05	7.05E-05	2.76E-05	7.65E-05	2.83E-05	2.54E-05	1.38E-05	2.96E-05	1.54E-05
	Quarters 2-4	1.38E-05	3.40E-06	3.58E-05	1.50E-05	3.14E-05	3.00E-05	2.33E-05	9.60E-06	2.86E-05	4.90E-06
	Average	5.58E-05	1.99E-05	5.32E-05	2.13E-05	5.40E-05	2.92E-05	2.44E-05	1.17E-05	2.91E-05	1.02E-05

Source: Schmidt et al. 1992.
Negative values indicate concentrations at or near background levels of radioactivity.
Shaded areas indicate a positive detection, the result is greater than the error.
The detection limits are as follows:

Mn-54 = 2.0E-02, Co-58 = 2.0E-02, Co-60 = 2.0E-02, An-65 = 4.0E-02, Sr-90 = 5.0E-03, Nb-95 = 3.0E-02, Zr-95 = 3.0E-02, Ru-106 = 1.7E-01, Cs-134 = 2.0E-02, Cs-137 = 2.0E-02, Eu-152 = 1.1E-01, Eu-154 = 5.0E-02, Eu-155 = 5.0E-02, Pu-238 = 6.0E-04, Pu-239 = 6.0E-04, and U total = 1.0E-02.

Table A-2.8. Results of Soil Sampling for 1990 and 1991 (pCi/g)
Location 64

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	-2.06E+01	3.15E+01	1.90E+01	1.70E+01	2.25E+01
CePr-144	3.94E-02	5.62E-01	-1.30E-01	8.50E-01	8.47E-02
Co-60	-5.27E-03	2.03E-02	1.20E-02	5.10E-02	8.64E-03
Cs-134	-1.41E-01	3.21E-02	-2.50E-001	8.40E-02	1.96E-01
Cs-137	2.37E+00	2,47E-01	3.50E+00	3.80E-01	2.94E+00
Eu-154	4.38E-02	6.11E-02	2.80E-02	1.50E-01	3.59E-02
Eu-155	9.90E-02	7.88E-02	5.30E-03	1.40E-01	5.22E-02
K-40	1.42E+01	1.58E+00	1.80E+01	2.20E+00	1.61E+01
Pb-212	7.01E-01	8.22E-02	--	--	7.01E-01
Pb-214	5.34E-01	7.78E-02	--	--	5.34E-01
Pu-238	3.81E-04	3.04E-04	4.50E-04	2.30E-04	4.16E-04
Pu-239/240	1.12E-02	2.05E-03	1.70E-02	2.10E-03	1.41E-02
Ra-226	5.66E-01	7.92E-02	--	--	5.66E-01
Ru-106	-1.16E-01	3.51E-01	-9.10E-02	6.70E-01	1.04E-01
Sb-125	-4.55E-02	6.96E-02	-4.20E-02	1.60E-01	4.38E-02
Sr-90	2.82E+00	4.91E-01	3.20E+00	5.60E-01	3.01E+00
U-234	--	--	7.30E-01	8.80E-02	7.30E-01
U-235	1.31E-02	1.26E-02	1.90E-02	9.60E-03	1.61E-02
U-238	7.62E-01	1.07E-01	6.60E-01	8.10E-02	7.11E-01
U (Total)	8.18E-01	1.13E-01	--	--	8.18E-01
Zn-65	-3.75E-01	1.54E-01	-3.90E-01	2.60E-01	3.74E-01
ZrNb-95	1.75E+00	2.83E+00	-3.50E-02	2.10E+00	8.93E-01

Table A-2.8. Results of Soil Sampling for 1990 and 1991 (pCi/g)
Location 65

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	-1.72E+01	5.30E+01	1.50E+01	3.30E+01	1.61E+01
CePr-144	-3.45E-01	7.64E-01	-9.50E-03	1.30E+00	1.77E-01
Co-60	-9.58E-04	2.15E-02	2.30E-02	4.60E-02	1.20E-02
Cs-134	-3.16E-02	3.11E-02	-3.70E-01	1.00E-01	2.01E-01
Cs-137	7.02E+00	7.13E-01	1.70E+01	1.70E+00	1.20E+01
Eu-154	-8.80E-02	1.60E-01	-8.80E-02	1.60E-01	5.49E-02
Eu-155	2.37E-02	9.15E-02	-1.70E-02	2.00E-01	2.04E-02
K-40	1.44E+01	1.61E+00	1.70E+01	2.30E+00	1.57E+01
Pb-212	6.33E-01	7.91E-02	--	--	6.33E-01
Pb-214	4.77E-01	8.15E-02	--	--	4.77E-01
Pu-238	7.85E-04	4.79E-04	3.10E-04	2.20E-04	5.48E-04
Pu-239/240	5.18E-02	6.31E-03	8.20E-03	1.40E-03	3.00E-02
Ra-226	4.32E-01	7.28E-02	--	--	4.31E-01
Ru-106	3.84E-02	4.18E-01	8.00E-02	9.60E-01	5.92E-02
Sb-125	2.75E-02	1.10E-01	-2.20E-02	3.00E-01	2.48E-02
Sr-90	2.93E+00	5.36E-01	1.80E+00	3.40E-01	2.37E+00
U-234	--	--	7.30E-01	9.10E-02	7.30E-01
U-235	3.73E-02	1.96E-02	2.10E-02	1.10E-02	2.92E-02
U-238	7.64E-01	1.06E-01	7.50E-01	9.20E-02	7.57E-01
U (Total)	7.04E-01	1.01E-001	--	--	7.04E-01
Zn-65	-1.42E-01	1.45E-01	-1.90E-01	2.50E-01	1.66E-01
ZrNb-95	-1.91E+00	3.00E+00	1.20E+00	2.20E+00	1.56E+00

Table A-2.8. Results of Soil Sampling for 1990 and 1991 (pCi/g)
Location 66

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	-2.91E+00	6.34E+01	-3.30E+00	2.10E+01	1.62E+00
CePr-144	-4.60E-01	8.53E-01	6.40E-01	7.90E-01	5.50E-01
Co-60	1.06E-02	2.04E-02	-3.60E-02	3.80E-02	2.33E-02
Cs-134	-3.69E-01	6.08E-02	-8.60E-02	5.20E-02	2.28E-01
Cs-137	1.19E+01	1.20E+00	1.00E+01	1.10E+00	1.10E+01
Eu-154	-1.48E-02	7.23E-02	2.70E-02	1.00E-01	2.09E-02
Eu-155	5.72E-02	1.12E-01	1.50E+01	1.90E+00	1.56E+01
K-40	1.62E+01	1.79E+00	1.50E+01	1.90E+00	1.56E+01
Pb-212	8.22E-01	1.00E-01	--	--	8.22E-01
Pb-214	7.06E-01	1.08E-01	--	--	7.06E-01
Pu-238	4.07E-05	2.51E-04	2.60E-04	2.00E-04	1.50E-04
Pu-239/240	7.38E-03	1.67E-03	9.00E-03	1.40E-03	8.19E-03
Ra-226	--	--	--	--	
Ru-106	1.11E-01	5.44E-01	-2.40E-01	6.30E-01	1.76E-01
Sb-125	3.62E-02	1.33E-01	9.30E-02	1.90E-01	6.46E-02
Sr-90	1.84E+00	3.36E-01	1.80E+00	3.20E-01	1.82E+00
U-234	--	--	7.50E-01	9.00E-02	7.50E-01
U-235	3.02E-02	1.74E-02	2.20E-02	1.20E-02	2.61E-02
U-238	7.76E-01	1.07E-01	6.80E-01	8.30E-02	7.28E-01
U (Total)	7.17E-01	1.02E-01	--	--	7.17E-01
Zn-65	-3.11E-01	1.77E-01	-1.40E-01	1.70E-01	2.26E-01
ZrNb-95	-4.95E-01	3.39E+00	2.40E-01	1.50E+00	3.68E-01

Table A-2.8. Results of Soil Sampling for 1990 and 1991 (pCi/g)
Location 67

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	1.34E+01	3.84E+01	-7.50E-01	1.20E+01	7.08E+00
CePr-144	-1.41E-01	8.65E-01	-7.60E-02	6.30E-01	1.09E-01
Co-60	-4.78E-03	2.47E-02	-2.00E-02	4.10E-02	1.24E-02
Cs-134	-3.05E-01	5.36E-02	-8.90E-02	4.50E-02	1.97E-01
Cs-137	1.01E+00	1.19E-01	5.30E-01	9.50E-02	7.70E-01
Eu-154	-6.26E-02	8.01E-02	1.20E-02	1.20E-01	3.73E-02
Eu-155	-5.52E-02	1.04E-01	-2.04E-02	1.20E-01	3.96E-02
K-40	1.26E+01	1.50E+00	1.60E+01	2.00E+00	1.43E+01
Pb-212	7.51E-01	9.28E-02	--	--	7.51E-01
Pb-214	5.72E-01	8.90E-02	--	--	5.72E-01
Pu-238	-1.54E-05	1.68E-04	1.30E-04	1.40E-04	6.77E-05
Pu-239/240	5.18E-03	1.25E-03	3.90E-03	7.10E-04	4.54E-03
Ra-226	5.56E-01	9.14E-02	--	--	5.56E-01
Ru-106	-4.02E-01	4.31E-01	4.00E-02	4.70E-01	2.21E-01
Sb-125	1.45E-02	7.76E-02	-9.60E-03	9.50E-02	1.21E-02
Sr-90	1.04E+00	1.87E-01	7.60E-01	1.50E-01	9.00E-01
U-234	--	--	6.50E-01	8.30E-02	6.50E-01
U-235	5.16E-02	2.16E-02	2.30E-02	1.20E-02	3.73E-02
U-238	7.84E-01	1.06E-01	7.30E-01	9.10E-02	7.57E-01
U (Total)	9.14E-01	1.20E-01	--	--	9.14E-01
Zn-65	-2.93E-01	2.09E-01	-2.40E-01	1.90E-01	2.67E-01
ZrNb-95	1.17E+00	4.05E+00	2.10E-01	1.70E+00	6.90E-01

Table A-2.8. Results of Soil Sampling for 1990 and 1991 (pCi/g)
Location 68

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	-2.48E+01	3.31E+01	4.60E+00	1.40E+01	1.47E+01
CePr-144	-1.17E-02	5.60E-01	6.30E-02	7.60E-01	
Co-60	-5.66E-03	2.34E-02	-3.80E-02	5.70E-02	2.18E-02
Cs-134	-1.46E-01	3.42E-02	-7.00E-02	5.30E-02	1.08E-01
Cs-137	4.35E-01	5.65E-02	4.50E-01	8.40E-02	4.43E-01
Eu-154	-5.13E-02	7.37E-02	-1.30E-01	1.70E-01	9.07E-02
Eu-155	-3.07E-03	7.64E-02	3.00E-02	1.40E-01	1.65E-02
K-40	1.59E+01	1.77E+00	1.70E+01	2.30E+00	8.80E+00
Pb-212	7.51E-01	8.77E-02	--	--	7.51E-01
Pb-214	7.67E-01	9.96E-02	--	--	7.67E-01
Pu-238	4.79E-04	3.53E-04	8.90E-04	3.10E-04	6.85E-04
Pu-239/240	6.04E-03	1.32E-03	1.10E-02	1.40E-03	8.52E-03
Ra-226	6.03E-01	8.67E-02	--	--	6.03E-01
Ru-106	1.20E-01	3.30E-01	-5.00E-01	5.80E-01	3.10E-01
Sb-125	3.68E-02	5.86E-02	-6.80E-02	1.50E-01	5.24E-02
Sr-90	3.53E+00	6.55E-01	8.00E-01	1.60E-01	2.17E+00
U-234	--	--	7.30E-01	8.80E-02	7.30E-01
U-235	4.87E-02	2.17E-02	2.50E-02	1.10E-02	3.69E-02
U-238	6.23E-02	9.38E-02	7.10E-01	8.50E-02	6.67E-01
U (Total)	5.91E-01	9.20E-02	--	--	5.91E-01
Zn-65	-4.02E-01	1.77E-01	-2.70E-01	2.50E-01	3.36E-01
ZrNb-95	-1.08E+00	3.59E+00	1.40E+00	2.00E+00	1.24E+00

Table A-2.8. Results of Soil Sampling for 1990 and 1991 (pCi/g)
Location 69

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	-3.55E-01	3.85E+01	-7.30E+00	1.60E+01	3.83E+00
CePr-144	3.66E-01	6.05E-01	1.80E-01	7.60E-01	2.73E-01
Co-60	8.16E-03	2.12E-02	8.00E-02	3.70E-02	4.41E-02
Cs-134	-2.89E-01	4.96E-02	-3.30E-01	7.50E-02	3.10E-01
Cs-137	2.98E+00	3.09E-01	8.70E-01	1.20E-01	1.93E+00
Eu-154	1.17E-02	6.37E-02	-3.40E-02	1.40E-01	2.29E-02
Eu-155	4.71E-02	8.39E-02	8.00E-02	1.20E-01	6.36E-02
K-40	1.39E+01	1.57E+00	1.50E+01	2.00E+00	1.45E+01
Pb-212	6.82E-01	8.14E-02	--	--	6.82E-01
Pb-214	6.19E-01	9.04E-02	--	--	6.19E-01
Pu-238	2.24E-04	2.16E-04	2.60E-04	2.00E-04	2.42E-04
Pu-239/240	3.06E-03	8.93E-04	2.30E-03	6.50E-04	2.68E-03
Ra-226	5.77E-01	8.48E-02	--	--	5.77E-01
Ru-106	-1.07E-01	3.76E-01	5.70E-01	5.90E-01	3.39E-01
Sb-125	8.35E-03	7.84E-02	-4.40E-02	1.20E-01	2.62E-02
Sr-90	6.17E-01	1.09E-01	4.60E-01	8.90E-02	5.39E-01
U-234	--	--	9.70E-01	1.20E-01	9.70E-01
U-235	3.73E-03	9.13E-02	3.50E-02	1.40E-02	1.94E-02
U-238	9.21E-01	4.36E-01	9.60E-01	1.20E-01	9.41E-01
U (Total)	1.15E+00	4.99E-01	--	--	1.15E+00
Zn-65	-4.63E-01	1.77E-01	-3.30E-01	2.60E-01	3.97E-01
ZrNb-95	-3.08E+00	3.54E+00	0.00E-01	1.80E+00	1.99E+00

Table A-2.8. Results of Soil Sampling for 1990 and 1991 (pCi/g)
Location 70

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	-1.87E+01	2.69E+01	1.20E+00	1.10E+01	9.41E+00
CePr-144	7.97E-02	4.81E-01	3.40E-02	6.80E-01	5.69E-02
Co-60	1.49E-02	1.81E-02	9.30E-03	4.00E-02	1.21E-02
Cs-134	-3.01E-02	2.19E-02	-9.60E-02	4.80E-02	6.31E-02
Cs-137	5.65E-01	6.81E-02	2.80E-01	5.90E-02	4.23E-01
Eu-154	-1.11E-03	5.89E-02	-3.50E-02	1.20E-01	1.81E-02
Eu-155	2.59E-02	6.65E-02	4.50E-02	1.20E-01	3.55E-02
K-40	1.46E+01	1.61E+00	1.80E+01	2.20E+00	1.63E+01
Pb-212	6.43E-01	7.51E-02	--	--	6.43E-01
Pb-214	5.54E-01	7.27E-02	--	--	5.54E-01
Pu-238	9.19E-05	1.61E-04	1.10E-04	1.10E-04	1.01E-04
Pu-239/240	9.36E-04	4.09E-04	5.40E-03	8.70E-04	3.17E-03
Ra-226	5.48E-01	7.33E-02	--	--	5.48E-01
Ru-106	1.19E-01	2.59E-01	-5.90E-02	4.90E-01	1.25E-01
Sb-125	-1.76E-02	5.53E-02	-3.20E-03	9.80E-02	1.04E-02
Sr-90	6.89E-01	1.25E-01	2.30E-01	4.50E-02	4.60E-01
U-234	--	--	7.50E-01	9.20E-02	7.50E-01
U-235	3.86E-02	1.83E-02	3.30E-02	1.30E-02	3.58E-02
U-238	8.44E-01	1.11E-01	7.50E-01	9.10E-02	7.97E-01
U (Total)	8.52E-01	1.13E-01	--	--	8.52E-01
Zn-65	-3.14E-01	1.29E-01	-2.80E-01	2.10E-01	2.97E-01
ZrNb-95	1.04E+00	2.93E+00	-3.20E-01	1.60E+00	6.80E-01

Table A-2.8. Results of Soil Sampling for 1990 and 1991 (pCi/g)
Location 71

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	-2.54E-01	2.35E+01	4.00E-01	1.20E+01	1.29E+01
CePr-144	5.45E-01	4.79E-01	4.60E-01	8.00E-01	5.03E-01
Co-60	-1.61E-02	1.80E-02	-1.50E-02	4.60E-02	1.56E-02
Cs-134	-3.16E-02	1.82E-02	-2.40E-01	6.00E-02	1.36E-01
Cs-137	5.58E-01	6.62E-02	4.50E-01	7.70E-02	5.04E-01
Eu-154	-3.91E-02	5.19E-02	-4.30E-02	1.30E-01	4.11E-02
Eu-155	5.14E-02	6.16E-02	2.70E-03	1.30E-01	2.71E-02
K-40	1.26E+01	1.40E+00	1.50E+01	1.90E+00	1.38E+01
Pb-212	5.77E-01	6.70E-02	--	--	5.77E-01
Pb-214	4.81E-01	6.41E-02	--	--	4.81E-01
Pu-238	3.46E-05	2.27E-04	1.30E-04	1.80E-04	8.23E-05
Pu-239/240	1.73E-03	6.25E-04	2.50E-03	6.70E-04	2.12E-03
Ra-226	4.01E-01	5.83E-02	--	--	4.01E-01
Ru-106	8.63E-02	2.36E-01	-6.30E-01	4.80E-01	3.58E-01
Sb-125	2.63E-03	5.09E-02	-1.60E-02	1.10E-01	9.32E-03
Sr-90	9.04E-01	1.59E-01	5.50E-01	1.00E-01	7.27E-01
U-234	--	--	8.50E-01	1.00E-01	8.50E-01
U-235	6.43E-02	2.40E-02	3.90E-02	1.40E-02	5.17E-02
U-238	9.89E-01	1.27E-01	8.60E-01	1.00E-01	9.25E-01
U (Total)	1.12E+00	1.42E-01	--	--	1.12E+00
Zn-65	-2.78E-01	1.32E-01	-4.00E-01	2.30E-01	3.39E-01
ZrNb-95	1.13E+00	2.59E+00	2.90E-01	1.70E+00	7.10E-01

Table A-2.8. Results of Soil Sampling for 1990 and 1991 (pCi/g)
Location 72

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	-9.43E+00	3.32E+01	9.60E+00	7.80E+00	9.52E+00
CePr-144	-1.10E-01	6.35E-01	-4.20E-01	5.50E-01	2.65E-01
Co-60	1.36E-02	2.31E-02	8.90E-03	3.10E-02	1.13E-02
Cs-134	-5.52E-02	2.76E-02	-2.60E-01	5.10E-02	1.58E-01
Cs-137	5.56E-01	7.29E-02	4.80E-02	3.00E-02	3.02E-01
Eu-154	2.01E-02	7.69E-02	5.10E-02	8.70E-02	3.56E-02
Eu-155	7.11E-02	7.90E-02	5.80E-02	8.00E-02	6.46E-02
K-40	1.27E+01	1.51E+00	1.50E+01	1.80E+00	1.39E+01
Pb-212	5.59E-01	7.33E-02	--	--	5.59E-01
Pb-214	5.02E-01	8.02E-02	--	--	5.02E-01
Pu-238	8.97E-04	5.33E-04	7.40E-05	9.10E-05	4.86E-04
Pu-239/240	2.15E-02	3.53E-03	1.70E-03	4.30E-04	1.16E-02
Ra-226	4.53E-01	7.78E-02	--	--	4.53E-01
Ru-106	4.70E-02	3.48E-01	2.50E-01	3.60E-01	1.49E-01
Sb-125	5.88E-02	6.71E-02	5.40E-02	6.80E-02	5.64E-02
Sr-90	8.13E-01	1.44E-01	9.00E-02	1.90E-02	4.52E-01
U-234	--	--	5.50E-01	7.90E-02	5.50E-01
U-235	2.09E-02	1.41E-02	2.80E-02	1.40E-02	2.45E-02
U-238	6.66E-01	9.28E-02	6.30E-01	8.70E-02	6.48E-01
U (Total)	6.86E-01	9.61E-02	--	--	6.86E-01
Zn-65	-2.78E-01	1.79E-01	-1.60E-01	1.60E-01	2.19E-01
ZrNb-95	-1.08E-01	3.94E-00	-6.20E-01	1.20E+00	3.64E-01

Table A-2.8. Results of Soil Sampling for 1990 and 1991 (pCi/g)
Location 73

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	-2.78E+01	1.02E+02	-8.30E+00	2.60E+01	1.81E+01
CePr-144	1.01E+00	1.52E+00	6.70E-01	9.20E-01	8.40E-01
Co-60	7.65E-03	2.23E-02	-1.20E-02	3.70E-02	9.83E-03
Cs-134	-1.54E-01	5.65E-02	-7.80E-02	5.50E-02	1.16E-01
Cs-137	2.05E+01	2.07E+00	1.70E+01	1.70E+00	1.88E+01
Eu-154	1.23E-01	7.45E-02	7.50E-02	9.60E-02	9.90E-02
Eu-155	4.03E-02	2.01E-01	9.20E-02	1.60E-01	6.62E-02
K-40	1.13E+01	1.36E+00	1.30E+01	1.70E+00	1.22E+01
Pb-212	5.24E-01	1.01E-01	--	--	5.24E-01
Pb-214	4.73E-01	1.13E-01	--	--	4.73E-01
Pu-238	6.56E-03	1.38E-03	6.50E-05	1.40E-04	3.31E-03
Pu-239/240	1.76E-01	2.08E-02	4.10E-03	7.90E-04	9.01E-02
Ra-226	5.05E-01	9.69E-02	--	--	5.05E-01
Ru-106	-1.88E-01	7.82E-01	-9.70E-02	6.40E-01	1.43E-01
Sb-125	8.39E-02	2.09E-01	-4.60E-02	2.00E-01	6.50E-02
Sr-90	1.01E+01	1.92E+00	1.40E+00	2.70E-01	5.75E+00
U-234	--	--	6.60E-01	8.30E-02	6.60E-01
U-235	1.73E-02	1.36E-02	2.00E-02	1.00E-02	1.87E-02
U-238	8.12E-01	1.09E-01	6.60E-01	8.30E-02	7.36E-01
U (Total)	7.91E-01	1.09E-01	--	--	7.91E-01
Zn-65	-3.69E-01	1.80E-01	-2.20E-01	1.70E-01	2.95E-01
ZrNb-95	-4.89E+00	3.99E+00	-1.70E+00	1.50E+00	3.30E+00

Table A-2.8. Results of Soil Sampling for 1990 and 1991 (pCi/g)
Location 74

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	-6.82E-02	3.53E-01	-5.30E+00	1.70E+01	2.68E+00
CePr-144	-1.51E-01	3.68E-01	1.30E-01	8.00E-01	1.41E-01
Co-60	2.33E-02	2.38E-02	-3.60E-02	6.30E-02	2.97E-02
Cs-134	-1.64E-01	3.72E-02	-7.20E-02	5.60E-02	1.18E-01
Cs-137	6.32E-01	8.27E-02	8.40E-01	1.20E-01	7.36E-01
Eu-154	3.51E-02	8.16E-02	-1.60E-02	1.60E-01	2.56E-02
Eu-155	2.34E-02	1.01E-01	2.40E-02	1.30E-01	2.37E-02
K-40	1.33E+01	1.62E+00	1.80E-01	2.40E+00	1.57E+01
Pb-212	5.68E-01	8.56E-02	--	--	5.68E-01
Pb-214	--	--	--	--	
Pru-238	-4.69E-05	4.66E-05	2.80E-04	2.10E-04	1.63E-04
Pu-239/240	2.75E-03	8.98E-04	9.20E-03	1.40E-03	5.98E-03
Ra-226	--	--	--	--	
Ru-106	1.10E-01	2.40E-01	-1.70E-01	5.80E-01	1.40E-01
Sb-125	5.45E-02	6.03E-02	-3.70E-02	1.40E-01	4.58E-02
Sr-90	8.35E-02	1.71E-02	1.00E-01	2.00E-02	9.18E-02
U-234	--	--	8.00E-01	9.50E-02	8.00E-01
U-235	1.49E-02	1.28E-02	1.80E-02	9.90E-03	1.65E-02
U-238	6.78E-01	9.54E-02	6.90E-01	8.50E-02	6.84E-01
U (Total)	7.02E-01	9.89E-02	--	--	7.02E-01
Zn-65	-8.83E-02	6.82E-02	-1.50E-01	2.30E-01	1.19E-01
ZrNb-95	-5.98E-02	8.15E-02	-1.80E+00	2.10E+00	9.30E-01

Table A-2.8. Results of Soil Sampling for 1990 and 1991 (pCi/g)
Location 75

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	1.24E+01	2.71E+01	-9.00E+00	1.00E+01	1.07E+01
CePr-144	4.36E-01	5.17E-01	-3.20E-02	6.10E-02	2.34E-01
Co-60	-1.01E-02	1.96E-02	-1.50E-02	3.10E-02	1.26E-02
Cs-134	-1.65E-01	3.32E-02	-3.40E-01	5.90E-02	2.53E-01
Cs-137	7.87E-01	8.94E-02	1.30E+00	1.50E-01	1.04E+00
Eu-154	-8.76E-03	5.97E-02	-1.70E-02	9.50E-02	1.29E-02
Eu-155	4.64E-02	6.82E-02	4.50E-03	1.00E-01	2.55E-02
K-40	1.48E+01	1.63E+00	1.70E+01	2.00E+00	1.59E+01
Pb-212	6.28E-01	7.39E-02	--	--	--
Pb-214	5.82E-01	7.77E-02	--	--	--
Pu-238	1.54E-03	6.57E-04	1.20E-03	4.30E-04	1.37E-03
Pu-239/240	4.08E-02	5.92E-03	1.40E-02	2.10E-03	2.74E-02
Ra-226	4.82E-01	6.88E-02	--	--	--
Ru-106	1.05E+00	3.34E-01	-1.70E-01	4.10E-01	6.10E-01
Sb-125	4.93E-02	5.65E-02	4.90E-03	1.00E-01	2.71E-02
Sr-90	1.78E+00	3.36E-01	4.00E-01	7.40E-02	1.09E+00
U-234	--	--	8.90E-01	1.10E-01	8.90E-01
U-235	1.47E-02	1.40E-02	3.30E-02	1.30E-02	2.39E-02
U-238	6.81E-01	1.02E-01	8.30E-01	9.90E-02	7.56E-01
U (Total)	7.36E-01	1.09E-01	--	--	--
Zn-65	3.81E-01	1.68E-01	4.03E-01	1.90E-01	4.06E-01
ZrNb-95	-1,44E+00	2.85E+00	7.80E-01	1.20E+00	1.11E+00

Table A-2.8. Results of Soil Sampling for 1990 and 1991 (pCi/g)
Location 76

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	3.27E+01	2.63E+01	-1.80E-01	8.60E+00	1.64E+01
CePr-144	-5.87E-02	5.43E-01	-7.10E-02	5.50E-01	6.49E-02
Co-60	-9.08E-04	2.14E-02	-8.60E-03	3.20E-02	4.75E-03
Cs-134	-4.93E-02	2.28E-02	-6.40E-02	3.80E-02	5.67E-02
Cs-137	2.61E-01	3.81E-02	1.30E-01	3.60E-02	1.96E-01
Eu-154	-1.00E-02	5.87E-02	3.50E-02	1.10E-01	2.25E-02
Eu-155	5.59E-02	6.69E-02	1.40E-01	1.00E-01	9.80E-02
K-40	1.32E+01	1.48E+00	1.40E+01	1.80E+00	1.36E+01
Pb-212	7.43E-01	8.53E-02	--	--	7.43E-01
Pb-214	5.85E-01	7.76E-02	--	--	5.85E-01
Pu-238	7.10E-04	3.91E-04	4.60E-04	2.10E-04	5.85E-04
Pu-239/240	7.56E-02	9.36E-03	5.90E-03	9.00E-04	4.08E-02
Ra-226	5.84E-01	7.81E-02	--	--	5.84E-01
Ru-106	9.51E-02	2.61E-01	8.00E-02	4.40E-01	8.76E-02
Sb-125	-7.24E-03	5.50E-02	-5.30E-03	8.90E-02	6.27E-03
Sr-90	2.92E-01	5.67E-02	1.40E-01	3.60E-02	2.16E-01
U-234	--	--	7.20E-01	1.20E-01	7.20E-01
U-235	3.69E-02	1.6E-02	1.80E-02	2.80E-02	2.75E-02
U-238	8.80E-01	1.12E-01	6.80E-01	1.10E-01	7.80E-01
U (Total)	9.11E-01	1.16E-01	--	--	9.11E-01
Zn-5	-3.26E-01	1.48E-01	-1.90E-01	1.70E-01	2.58E-01
ZrNb-95	-1.89E+00	2.86E-00	1.00E+00	1.40E+00	1.45E+00

Table A-2.8. Results of Soil Sampling for 1990 and 1991 (pCi/g)
Location 77

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	-1.86E+00	2.73E+01	-1.60E-01	7.50E+00	1.01E+00
CePr-144	-6.19E-02	4.14E-01	-3.20E-01	5.40E-01	1.91E-01
Co-60	-7.10E-03	2.00E-02	8.10E-03	2.80E-02	7.60E-03
Cs-134	-7.70E-02	2.53E-02	-3.10E-01	5.40E-02	1.94E-01
Cs-137	8.60E-01	9.89E-02	9.70E-02	3.80E-02	4.79E-01
Eu-154	-1.10E-02	5.29E-02	-1.80E-03	8.40E-02	6.40E-03
Eu-155	6.22E-02	5.25E-02	6.30E-03	9.20E-02	3.43E-02
K-40	1.46E+01	1.63E+00	1.50E+01	1.80E+00	1.48E+01
Pb-212	5.96E-01	7.07E-02	--	--	5.96E-01
Pb-214	5.46E-01	7.64E-02	--	--	5.46E-01
Pu-238	8.45E-04	3.87E-04	3.10E-04	1.90E-04	5.78E-04
Pr-239/240	2.56E-02	3.44E-03	4.40E-03	7.70E-04	1.50E-02
Ra-226	5.28E-01	7.87E-02	--	--	5.28E-01
Ru-106	-1.23E-01	2.92E-01	-2.00E-01	3.70E-01	1.62E-01
Sb-125	2.28E-02	5.79E-02	-9.20E-02	7.80E-02	5.74E-02
Sr-90	1.76E-01	3.43E-02	1.20E-01	2.90E-02	1.48E-01
U-234	--	--	7.20E-01	1.20E-01	7.20E-01
U-235	3.30E-02	1.74E-02	3.90E-02	2.20E-02	3.60E-02
U-238	7.02E-01	9.88E-02	6.90E-01	1.10E-01	6.96E-01
U (Total)	6.74E-01	9.73E-02	--	--	6.74E-01
Zn-65	-4.67E-02	1.16E-01	-3.40E-01	1.60E-01	1.93E-01
ZrNb-95	-3.82E+00	3.10E+00	3.20E-01	1.10E+00	2.07E+00

Table A-2.8. Results of Soil Sampling for 1990 and 1991 (pCi/g)
Location 78

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	-1.31E+01	3.22E+01	-6.70E+00	1.20E+01	9.90E+00
CePr-144	-2.75E-02	5.92E-01	2.10E-01	6.90E-01	1.19E-01
Co-60	-8.37E-03	2.31E-02	2.80E-02	4.00E-02	1.82E-02
Cs-134	-2.97E-01	5.01E-02	-5.20E-02	4.20E-02	1.75E-01
Cs-137	5.91E-01	7.54E-02	2.10E+00	2.40E-01	1.35E+00
Eu-154	-2.29E-02	8.80E-02	-2.60E-02	1.20E-01	2.45E-02
Eu-155	1.78E-02	7.65E-02	5.70E-02	1.20E-01	3.74E-02
K-40	1.69E+01	1.90E+00	1.90E+01	2.30E+00	1.80E+01
Pb-212	7.83E-01	92.0E-=02	--	--	7.83E-01
Pb-214	6.46E-01	8.93E-02	--	--	6.46E-01
Pr-238	2.91E-04	2.35E-04	1.90E-03	5.20E-04	1.10E-03
Pr-239/240	1.94E-02	2.83E-03	6.70E-02	7.50E-03	4.32E-02
Ra-226	6.20E-01	8.87E-02	--	--	6.20E-01
Ru-106	5.12E-02	2.61E-01	-4.80E-02	4.70E-01	4.97E-02
Sb-125	-3.62E-02	6.42E-02	-2.30E-02	1.00E-01	2.96E-02
Sr-90	2.00E-01	3.90E-02	4.10E-01	9.20E-02	3.05E-01
U-234			8.90E-01	1.10E-01	8.90E-01
U-235	2.56E-02	1.69E-02	1.80E-02	1.10E-02	2.18E-02
U-238	8.99E-01	1.19E-01	9.80E-01	1.20E-01	9.40E-01
U (Total)	7.58E-01	1.07E-01	--	--	7.58E-01
Zn-65	-6.20E-01	2.08E-01	-2.05E-01	1.80E-01	4.35E-01
ZrNb-95	1.68E+00	3.82E+00	-1.30E+00	1.40E+00	1.49E+00

Table A-2.8. Results of Soil Sampling for 1990 and 1991 (pCi/g)
Location 79

Radionuclide	1990 Result	1990 Error	1991 Result	1991 Error	Average Result
Be-7	-1.65E+01	5.08E+01	1.40E+00	7.50E+00	8.95E+00
CePr-144	5.91E-02	7.28E-01	-8.20E-02	5.20E-01	7.11E-02
Co-60	-9.50E-03	2.88E-02	2.70E-03	3.10E-02	6.10E-03
Cs-134	-3.71E-01	6.58E-02	-2.60E-01	5.40E-02	3.16E-01
Cs-137	3.02E+00	3.21E-01	2.90E-01	5.70E-02	1.66E+00
Eu-154	1.24E-01	7.89E-02	-4.00E-02	9.90E-02	8.20E-02
Eu-155	1.07E-01	9.59E-02	2.80E-02	8.80E-02	6.75E-02
K-40	1.39E+01	1.69E+00	1.30E-01	1.60E+00	1.35E+01
Pb-212	6.43E-01	8.54E-02	--	--	6.43E-01
Pb-214	7.25E-01	1.13E-01	--	--	7.25E-01
Pu-238	5.18E-03	1.09E-03	5.60E-04	2.50E-04	2.87E-03
Pr-239/24-0	1.74E-01	1.97E-02	1.00E-02	1.40E-03	9.20E-02
Ra-226	5.93E-01	1.04E-01	--	--	5.93E-01
Ru-106	1.58E-01	4.92E-01	-3.70E-02	3.90E-01	9.75E-02
Sb-125	-4.16E-02	1.07E-01	1.50E-01	7.50E-02	2.83E-02
Sr-90	8.42D-01	1.35E-01	1.20E-01	2.40E-02	4.81E-01
U-234	--	--	7.50E-01	9.00E-02	7.50E-01
U-235	2.98E-02	2.09E-02	1.80E-02	9.70E-03	2.39E-02
U-238	8.31E-01	1.27E-01	7.10E-01	8.60E-02	7.71E-01
U (Total)	9.15E-01	1.37E-01	--	--	9.15E-01
Zn-65	-6.62E-01	2.50E-01	-4.50E-01	1.80E-01	5.56E-01
ZrNb-95	2.81E+00	4.39E+00	-6.70E-01	1.20E+00	1.74E+00

Source: Schmidt et al. 1992
Negative values indicate concentrations at or near background levels of radioactivty.
Shaded areas indicate a postive detection, the result is great than the error.
The detection limits are as follows: Mn-54 = 2.0E-02, Co-58 = 2.0E-02, Co-60 = 2.0E-02, Zn-65 = 4.03-02, Sr-90 = 5.0E-03, Nb-95 = 3.0E-02, Zr-95 = 3.0E-02, Ru-106 = 1.7E-01, Cs-134 = 2.0E-02, Cs-137 = 2.0E-02, Cs-137 = 2.0E-02, Eu-152 = 1.1E-01, Eu = 154 = 5.0E-02, Eu-155 = 5.0E-02, Pu-238 = 6.0E-04, Pu-239 = 6.0E-04, and U total = 1.0E-02
Dashes indicate data are not available.

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Table A-2.9. Results of External Radiation Monitoring TLDs (mrem/yr).

Sampling Location	1985	1986	1987	1988	1989	Average Total
2E 5: 218-E-12B						
Max	84	108	125	123	--	
Min	72	73	85	98	--	
Total	79	88	100	110	--	94
2E 6: 200-E NE						
Max	85	101	132	119	--	
Min	64	72	83	92	--	
Total	77	83	101	103	--	91
2E 11: 218-E-12B N						
Max	97	96	112	134	128	
Min	69	80	83	107	92	
Total	85	89	97	117	114	100
2E 12: 218-E-12B E						
Max	85	100	103	119	--	
Min	68	74	69	93	--	
Total	78	84	88	105	--	89
2E 17: 241-C TF W						
Max	104	121	122	134	140	
Min	76	83	92	108	104	
Total	89	98	104	12	119	107
2E 18: 241-C TF E						
Max	102	124	137	139	--	
Min	84	90	104	117	--	
Total	96	109	115	125	--	111
2E 23: PUREX N						
Max	100	135	132	138	--	
Min	67	81	90	65	--	
Total	85	107	106	115	--	103
2E 24: PUREX NE						
Max	112	129	131	148	--	
Min	85	94	100	70	--	
Total	100	111	117	114	--	111

9 2 1 2 6 3 1 3 4 4

Table A-2.9. Results of External Radiation Monitoring TLDs (mrem/yr).

Sampling Location	1985	1986	1987	1988	1989	Average Total
2E 29: PUREX S						
Max	73	96	92	104	--	
Min	64	68	75	64	--	
Total	68	77	84	89	--	80
2E 30: PUREX SE						
Max	76	85	94	114	--	
Min	63	68	71	65	--	
Total	68	78	81	92	--	80
2E 35: 200-E S						
Max	80	93	96	111	--	
Min	62	68	74	59	--	
Total	70	77	84	89	--	80
2E 36: 200-E SW						
Max	75	96	90	109	124	
Min	58	66	75	62	72	
Total	67	77	81	89	96	82
2E D: 216-A-29 Ditch E						
Max	94	116	108	122	120	
Min	69	79	84	72	100	
Total	81	91	96	103	111	96
216-A-29 Ditch						
Max	90	92	91	114	124	
Min	67	72	71	62	84	
Total	75	81	81	90	105	86
216-A-36B Crib #1						
Max	80	89	87	110	132	
Min	69	70	56	56	76	
Total	74	82	77	88	110	86
216-A-36B Crib #2						
Max	127	135	89	104	128	
Min	90	99	55	54	96	
Total	107	120	79	83	112	100

9 2 1 2 6 3 1 3 4 5

Table A-2.9. Results of External Radiation Monitoring TLDs (mrem/yr).

Sampling Location	1985	1986	1987	1988	1989	Average Total
216-A-10 Crib #1						
Max	82	99	92	110	136	
Min	70	73	71	59	88	
Total	74	83	83	88	112	88
216-A-10 Crib #2						
Max	76	96	89	107	108	
Min	85	63	72	51	88	
Total	67	77	82	84	101	82
PUREX #1						
Max	73	98	91	117	120	
Min	66	60	74	51	88	
Total	69	77	83	88	106	85
PUREX #2						
Max	80	118	101	110	124	
Min	68	67	78	52	76	
Total	73	90	88	88	103	88
PUREX #3						
Max	84	119	98	105	128	
Min	67	70	81	70	76	
Total	76	98	90	90	105	92
241-A TF #1						
Max	278	272	264	295	348	
Min	176	237	210	176	200	
Total	230	248	237	233	273	244
241-A TF #2						
Max	178	137	156	153	1812	
Min	133	111	127	97	136	
Total	154	121	138	123	562	220
241-A TF #3						
Max	119	119	126	151	2840	
Min	112	86	107	96	116	
Total	115	101	118	129	1158	324

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Table A-2.9. Results of External Radiation Monitoring TLDs (mrem/yr).

Sampling Location	1985	1986	1987	1988	1989	Average Total
241-A TF #4						
Max	93	107	113	140	9636	
Min	82	90	93	86	112	
Total	88	98	102	119	2545	590
241-A TF #5						
Max	81	97	104	119	140	
Min	74	66	77	80	108	
Total	78	79	89	101	125	94
241-A TF #6						
Max	109	111	108	126	164	
Min	72	73	84	77	100	
Total	88	91	97	106	125	101
241-A TF #7						
Max	240	133	149	149	196	
Min	85	125	110	110	108	
Total	127	129	120	132	151	132
241-A TF #8						
Max	6348	1918	2036	2778	3832	
Min	1956	1393	1535	1316	1660	
Total	4693	1721	1781	2212	2519	2585
241-A TF #9						
Max	775	823	809	864	844	
Min	353	657	438	464	652	
Total	555	748	666	616	740	665
241-A TF #10						
Max	1585	1418	832	1075	1316	
Min	463	822	649	453	848	
Total	899	1045	729	742	998	883
241-A TF #11						
Max	120	141	125	150	152	
Min	20	99	103	104	108	
Total	81	120	115	122	136	115

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Table A-2.9. Results of External Radiation Monitoring TLDs (mrem/yr).

Sampling Location	1985	1986	1987	1988	1989	Average Total
241-A TF #12						
Max	697	130	156	146	140	
Min	118	117	92	112	108	
Total	281	123	122	129	131	157
241-A TF #13						
Max	147	144	146	131	240	
Min	98	113	92	108	124	
Total	127	127	121	120	165	132
216-A-30 Crib #1						
Max	85	94	99	105	116	
Min	66	68	77	68	76	
Total	74	82	88	92	100	87
216-A-30 Crib #2						
Max	77	80	90	105	128	
Min	68	62	74	63	84	
Total	72	74	81	89	105	84
216-A-37-1 Crib #1						
Max	76	90	105	112	116	
Min	70	70	76	69	84	
Total	72	81	89	94	100	87
216-A-37-1 Crib #2						
Max	84	101	83	120	128	
Min	68	68	77	66	88	
Total	74	81	80	96	111	88
216-A-8 Crib #1						
Max	121	114	113	117	124	
Min	105	97	88	73	84	
Total	113	106	99	103	110	106
216-A-8 Crib #2						
Max	118	137	140	154	196	
Min	103	96	101	98	72	
Total	112	122	118	133	134	124

Source: Schmidt et al. 1990; Elder et al. 1986, 1987, 1988, 1989.
Dashes indicate data are not available.

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Table A-2.10. Results of External Radiation Monitoring TLDs 1990 and 1991 (mrem/yr).

Location	1990	1991	Average Total
215: 200-E SE			
Max	108	109	
Min	92	70	
Total	96	90	93
216: E-67 Baseline Site			
Max	112	110	
Min	88	78	
Total	101	91	96
217: 216-A-37-1 E			
Max	116	107	
Min	100	81	
Total	107	95	101
218: 216-A-37-1 N			
Max	124	103	
Min	96	73	
Total	103	93	98
219: Grout Facility			
Max	116	115	
Min	100	72	
Total	107	97	102
220: N of Grout Vaults			
Max	120	121	
Min	92	80	
Total	103	102	103
221: Grout Facility			
Max	118	111	
Min	88	83	
Total	95	98	97
222: 216-A-29			
Max	104	108	
Min	88	0	
Total	98	67	83
223: 216-A-8 S			
Max	120	122	
Min	100	90	
Total	106	107	107

Table A-2.10. Results of External Radiation Monitoring TLDs 1990 and 1991 (mrem/yr).

Location	1990	1991	Average Total
224: 216-A-8 E			
Max	132	114	
Min	100	78	
Total	121	100	111
225: 216-B-3-3			
Max	152	157	
Min	92	88	
Total	119	130	125
231: 218-E-12			
Max	116	112	
Min	100	71	
Total	105	101	103
234: 221-B NE			
Max	140	133	
Min	96	101	
Total	114	120	117
242: 216-A-10-1			
Max	112	105	
Min	92	69	
Total	99	91	95
243: 216-A-10-2			
Max	120	111	
Min	96	69	
Total	107	94	101
244: 216-A-36-1			
Max	112	123	
Min	92	75	
Total	100	100	100
245: 216-A-36-B-2			
Max	120	111	
Min	88	76	
Total	100	96	98
246: 202-A SE			
Max	112	104	
Min	96	81	
Total	100	95	98

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Table A-2.10. Results of External Radiation Monitoring TLDs 1990 and 1991 (mrem/yr).

Location	1990	1991	Average Total
247: 202-A-SE			
Max	108	122	
Min	96	78	
Total	104	102	103
248: 202-A Parking Lot			
Max	280	115	
Min	96	0	
Total	194	57	126
249: ATF #1			
Max	332	335	
Min	136	284	
Total	216	304	260
250: ATF #2			
Max	160	159	
Min	116	119	
Total	132	143	138
251: ATF #3			
Max	144	141	
Min	108	93	
Total	122	125	124
252: ATF #4			
Max	140	130	
Min	100	89	
Total	113	115	114
253: ATF #5			
Max	124	120	
Min	104	84	
Total	110	107	109
254: ATF #6			
Max	128	127	
Min	96	93	
Total	116	109	113

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Table A-2.10. Results of External Radiation Monitoring TLDs 1990 and 1991 (mrem/yr).

Location	1990	1991	Average Total
255: ATF #7			
Max	2300	130	
Min	112	107	
Total	1100	120	610
256: ATF #8			
Max	2000	1497	
Min	384	542	
Total	1200	837	1019
258: ATF #10			
Max	190	390	
Min	384	111	
Total	908	195	552
259: ATF #11			
Max	576	143	
Min	132	124	
Total	236	133	185
261: ATF #13			
Max	156	127	
Min	92	86	
Total	112	110	111
262: E Corner 241-AP Tank Farm			
Max	136	103	
Min	96	78	
Total	117	94	106

Source: Schmidt et al. 1992.

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