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Subject: Clinton Power Station
Annual Radiological Environmental Operating Report

Dear Sir:

Illinois Power is submitting the 1995 Annual Radiological Environmental Operating Report for Clinton Power Station. This submittal is provided in accordance with the requirements of Section 5.6.2 of Clinton Power Station Technical Specifications.

Sincerely yours,

Michael W. Lyon
Director-Licensing

WSI/csm

Attachment

cc: NRC Clinton Licensing Project Manager
NRC Resident Office, V-690
Regional Administrator, Region III, USNRC
Illinois Department of Nuclear Safety

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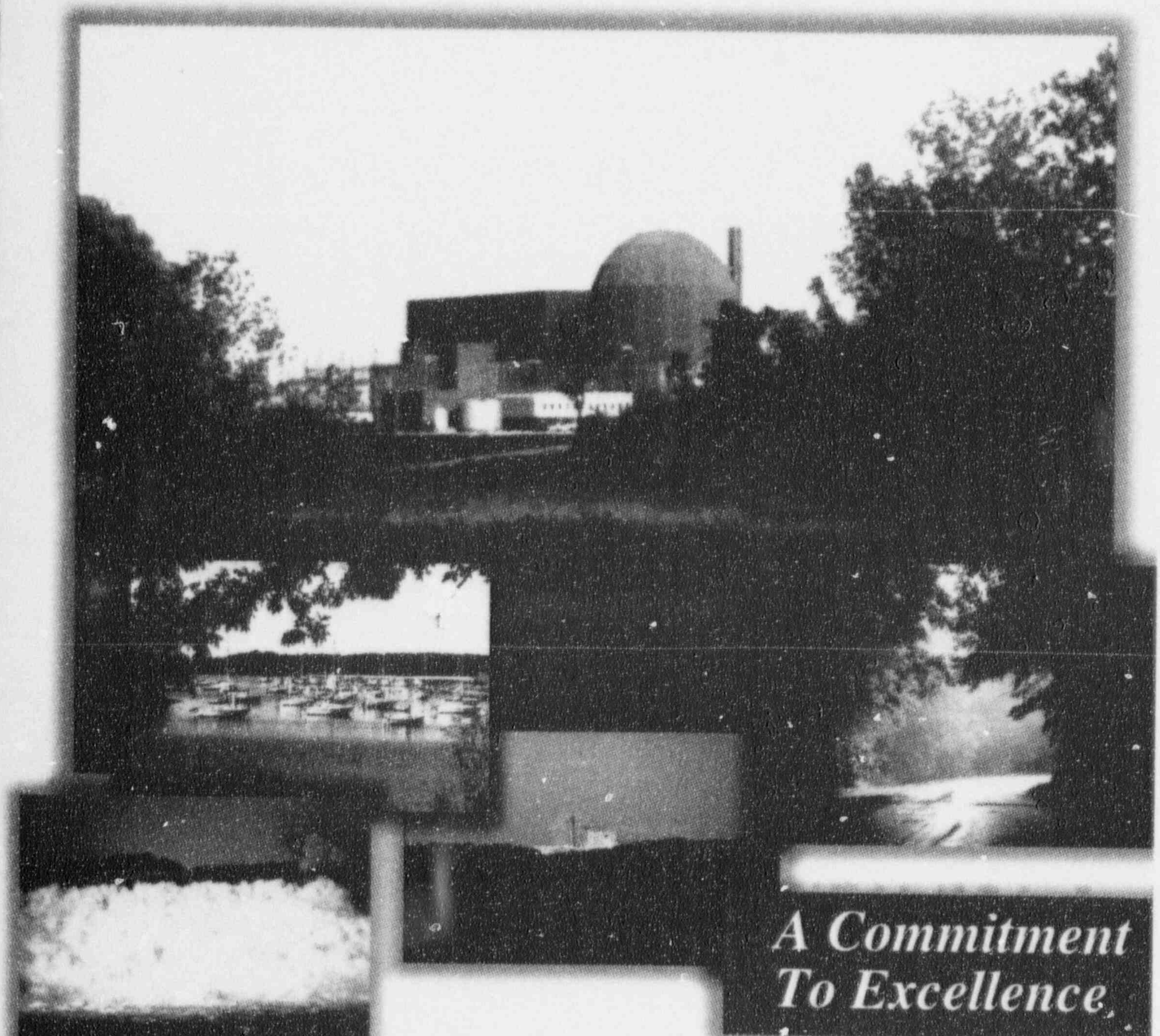
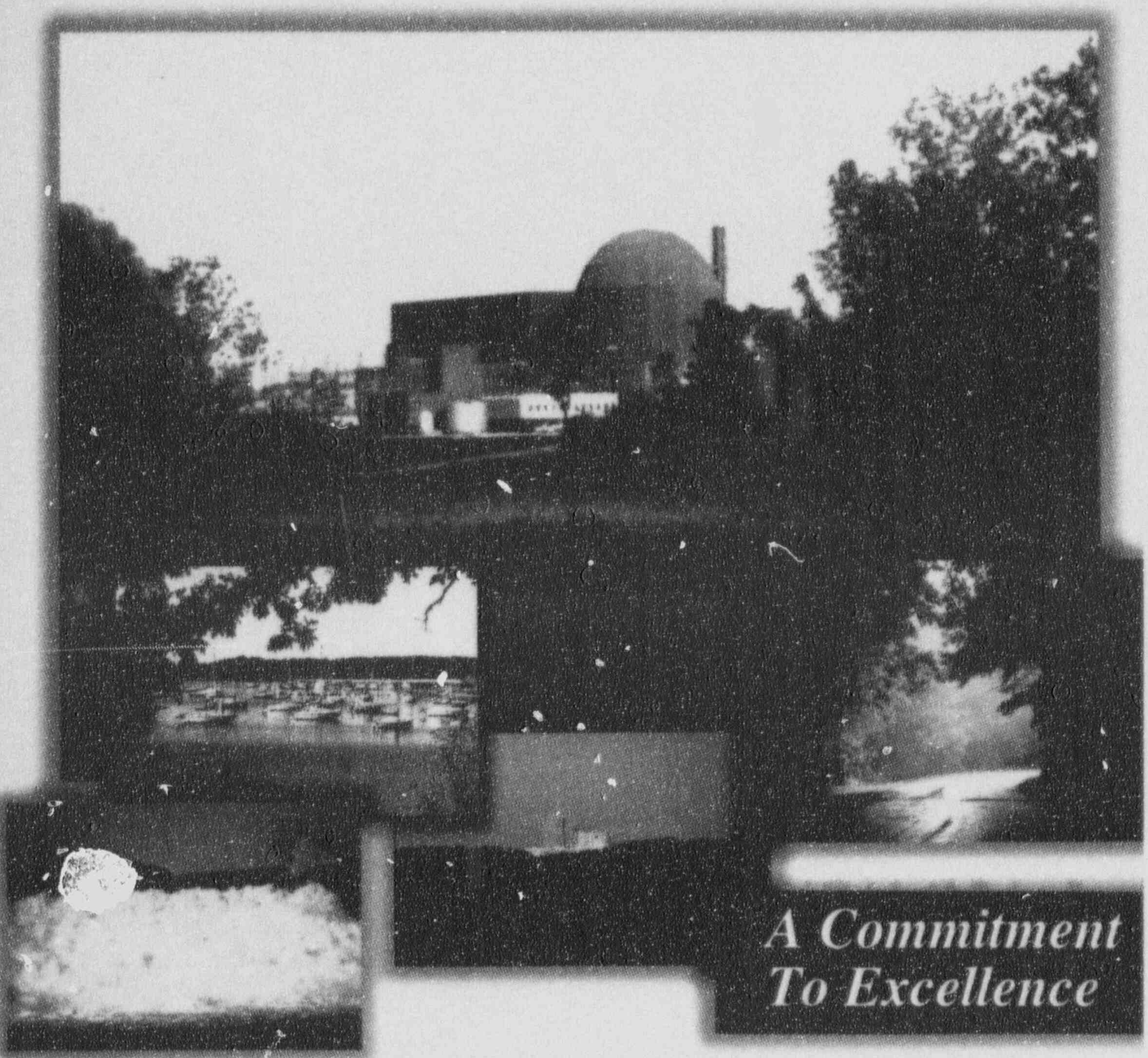
ILLINOIS POWER

Clinton Power Station 1995 Radiological Environmental Monitoring Report



Clinton Power Station
1995 Radiological Environmental Monitoring Report



1995

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

FOR THE

CLINTON POWER STATION

Prepared by

Radiological Programs Group

Plant Radiation Protection and Chemistry Department

May 1, 1996

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This report describes the Annual Radiological Environmental Monitoring Program (REMP) conducted near the Clinton Power Station (CPS) during the 1995 calendar year. The REMP was performed as required by the CPS Operating License issued by the United States Nuclear Regulatory Commission. The objective of the REMP is to assess any radiological impact upon the surrounding environment due to the operation of the Clinton Power Station.

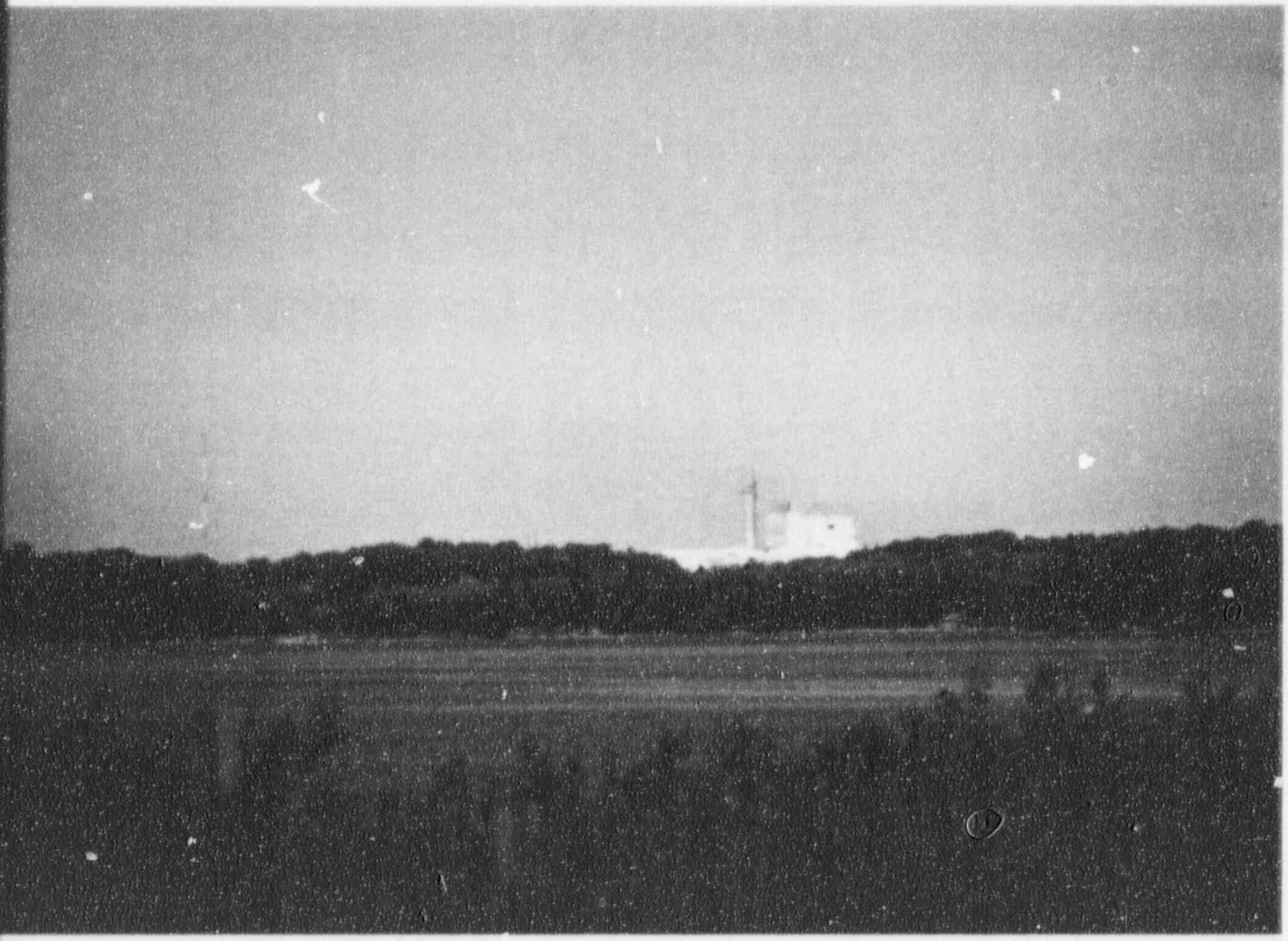
During 1995, over 1,800 environmental samples were collected. These samples represented direct radiation; atmospheric, terrestrial, and aquatic environments; and Clinton Lake surface water and public drinking water supplies. More than 2300 analyses were performed on these environmental samples.

Results of the analyses showed natural radioactivity and radioactivity attributed to other historical nuclear events. The radioactivity levels detected were similar to the preoperational levels. The CPS Preoperational REMP Report documented natural background radionuclides and man-made radioactivity in the environment surrounding CPS prior to plant operations.

Radiological environmental measurements taken during 1995 demonstrated that operational and engineered controls on the radioactive effluents released from the plant functioned as designed. Any radioactivity that was detected in the environment at indicator locations was appropriately compared with both the measurements at control locations (sample locations not affected by station operations) and preoperational results.

There were no radioactive liquid releases during 1995. Releases of gaseous radioactive materials were accurately measured in plant effluents. There were no gaseous releases that came close to approaching the limits specified in the CPS Offsite Dose Calculation Manual (ODCM). The highest *calculated* total body dose received by a member of the public due to the release of radioactive materials in gaseous effluents from Clinton Power Station was 0.00313 mrem.

All comparisons among operational data and preoperational data showed that the operation of Clinton Power Station had no measurable effect upon the environment in 1995.



INTRODUCTION

II. INTRODUCTION

The Radiological Environmental Monitoring Program (REMP) at Clinton Power Station (CPS) is designed to monitor the environment surrounding the plant for any radioactive material that may be released by CPS as a result of plant operations. The primary concern is what impact, if any, the radioactive materials released from CPS have on the general public. This report is prepared in a way that is useful to a specialized scientific community. However, this introduction, the explanations in later sections, and minimal use of technical terms are all designed to make this report understandable and useful to those with no background in environmental monitoring.

A. *CHARACTERISTICS OF RADIATION*

Atoms whose nuclei contain an excess of energy are called radioactive atoms. They release this excess energy by expelling electromagnetic or particulate radiation from their atomic centers to become stable (non-radioactive). This process is called "radioactive decay". X-rays and gamma rays are examples of electromagnetic radiation and are similar in many ways to visible light, microwaves and radio-waves. Particulate radiation may be either electrically charged such as alpha and beta particles, or has no charge, like neutrons.

The term "half-life" refers to the time required for half of a given amount of a radionuclide to decay. Some radionuclides have a half-life as short as a fraction of a second, while others have a half-life as long as a million years. Radionuclides may decay directly into stable elements or may undergo a series of decays which ultimately end up reaching a stable element.

Radionuclides are found in nature (e.g., radioactive uranium, thorium, carbon and potassium), and may also be produced artificially in accelerators and nuclear reactors (e.g., radioactive iodine, cesium and cobalt).

NATURALLY OCCURRING RADIONUCLIDES	MAN-MADE RADIONUCLIDES
Uranium	Iodine
Thorium	Cesium
Carbon	Cobalt
Potassium	Strontium
Lead	Barium

The activity of a radioactive source is the average number of nuclear disintegrations (decay) of the source per unit of time. The unit of activity is called the curie. A one curie radioactive source undergoes 2.2 trillion disintegrations per minute, but in the realm of nuclear power plant effluents and environmental radioactivity, this is a large unit. Therefore, two fractional units, the microcurie and the picocurie, are more commonly used.

1 curie (Ci)	=	2,220,000,000,000	disintegrations/minute
1 millicurie (mCi)	=	2,220,000,000	disintegrations/minute
1 *microcurie* (μCi)	=	2,220,000	disintegrations/minute
1 nanocurie (nCi)	=	2,220	disintegrations/minute
1 *picocurie* (pCi)	=	2.22	disintegrations/minute

The microcurie (uCi) is one millionth of a curie (Ci) and represents 2.2 million decays per minute. The picocurie (pCi) is one millionth of a microcurie and represents 2.2 decays per minute. Another way of comparing the pCi and the Ci is by analogy with distances. A picocurie would be the width of a pencil mark while a curie would be 100 trips around the earth.

Radioactivity is related to the half-life and the atomic mass of a radionuclide. For example, Uranium-235 (U-235) with a half-life of 704 million years requires about 462,400 grams to obtain an activity of one curie. But iodine-131 (I-131) with a half-life of 8.04 days only requires about 0.000008 grams to produce an activity of one curie.

Any mechanism that can supply the energy necessary to ionize an atom, break a chemical bond, or alter the chemistry of a living cell are capable of producing biological damage. Electromagnetic and particulate radiation can produce cellular damage in any of these ways. In assessing the biological effects of radiation, the type, energy, and amount of radiation must be considered.

External total body radiation involves exposure of all organs. Most background exposures are of this form. When radioactive elements enter the body through inhalation or ingestion, their distribution may not be uniform.

TARGET TISSUE	NUCLIDE
Bone	Strontium-90
Kidney	Uranium-235
Thyroid	Iodine-131
Muscle and Liver Tissue	Cesium-137
Gastrointestinal Tract	Cobalt-60

For example, radioiodine selectively concentrates in the thyroid gland, whereas radiocesium collects in muscle and liver tissue, and radiostrontium collects in mineralized bone. The total dose to organs by a given radionuclide is also influenced by the quantity and the duration of time that the radionuclide remains in the body. Owing to radioactive decay and human metabolism factors, some radionuclides stay in the body for very short times while others remain for years.

The amount of radiation dose that an individual receives is expressed in rem. Since human exposure to radiation usually involves very small exposures, the millirem (mrem) is the unit most commonly used. One millirem is one thousandth of a rem.

1 millirem = 0.001 Rem

B. SOURCES OF RADIATION EXPOSURE

Many sources of radiation exposure exist. The most common and least controllable source is natural background radiation from cosmic rays and the earth which mankind has always lived with and always will. Every second of our lives, over seven thousand atoms undergo radioactive decay in the body of the average adult.

Radioactive elements have always been a part of our planet and everything that has come from the earth, including our own bodies is, therefore, naturally radioactive.

Natural Radionuclides In The Earth's Crust

Potassium-40 (K-40)	Radium-226 (Ra-226)
Uranium-238 (U-238)	Radon-222 (Rn-222)
Thorium-232 (Th-232)	Lead-204 (Pb-204)

Examples of radioactive materials found in the Earth's crust today consists of radionuclides such as potassium-40, uranium-238, thorium-232, radium-226 and radon-222. These radionuclides are introduced into the water, soil and air by such natural processes as volcanic activity, weathering, erosion and radioactive decay.

Some of the naturally occurring radionuclides, such as radon, are a significant source of radiation exposure to the general public. Radioactive radon is a chemically inert gas produced naturally in the ground as a part of the uranium and thorium decay series. Radon continues to undergo radioactive decay, producing new naturally radioactive materials called "radon daughters". These new materials, which are solid particles, not gases, can stick to surfaces such as dust particles in the air.

Concentrations of radon in air are variable and are affected by concentrations of uranium and thorium in soil, as well as, altitude, soil porosity, temperature, pressure, soil moisture, rainfall, snow cover, atmospheric conditions, and season. Radon can move through cracks and openings into basements of buildings and become trapped in a small air volume indoors. Thus, indoor radon concentrations are usually higher than those found outdoors. Building materials such as cinder blocks and concrete are radon sources. Radon can also be dissolved in well water and contribute to airborne radon in houses when released through showers or washing.

Dust containing radon daughter particles can be inhaled and deposited on the surface of an individual's lung. Radon daughters emit high energy alpha radiation dose to the lung lining. Table 1 shows the average annual effective dose due to radon.

About three hundred cosmic rays originating from outer space pass through each person every second.

Cosmic-Ray-Activated Radionuclides

Beryllium-7	(Be-7)	Tritium	(H-3)
Beryllium-10	(Be-10)	Sodium-22	(Na-22)
Carbon-14	(C-14)	Phosphorus-32	(P-32)

The interaction of cosmic rays with atoms in the earth's atmosphere produces radionuclides such as Beryllium-7, Beryllium-10, Carbon-14, tritium, and Sodium-22. Portions of these radionuclides become deposited on land or in water while the remainder stay suspended in the atmosphere.

Consequently, there are natural radioactive materials in the soil, water, air and building materials that contribute to radiation doses to the human body. Natural drinking water contains trace amounts of uranium and radium; milk contains measurable amounts of potassium-40. Sources of natural radiation and their average contributing radiation doses are summarized in Table 1. Figure 1 graphically shows the percentage contribution from principal sources of radiation exposure to the general population of the United States. Radiation exposure levels from natural radiation fluctuate with time and also can vary widely from location to location. The average individual in the United States receives approximately three hundred mrem per year from natural sources.

In some areas of the country, the dose from natural radiation is significantly higher. Residents of Colorado, five thousand feet above sea level, receive additional dose due to the increase in cosmic and terrestrial radiation levels. In fact, for every one thousand feet in elevation above sea level, an individual will receive an additional one mrem per year from cosmic radiation. In several areas of the world, high concentrations of mineral deposits result in natural background radiation levels of several thousand mrem per year.

In addition to natural background radiation, the average individual is exposed to radiation from a number of man-made sources. The largest of these sources come from medical diagnosis: X-rays, CAT-scans, fluoroscopic examinations and radio-pharmaceuticals. Approximately 160 million people in the United States are exposed to medical or dental X-rays in any given year. The annual dose to an individual from such irradiation averages 53 mrem.

TABLE 1

COMMON SOURCES OF RADIATION

A. Average Annual Effective Dose Equivalent to the U.S. Population

1. Natural Sources	mrem
a. Radon	200
b. Cosmic, Terrestrial, Internal	100
2. Man-Made Sources	mrem
a. Medical	
X-ray Diagnosis	39
Nuclear Medicine	14
b. Consumer Products	10
c. Occupational	1
d. Miscellaneous Environmental	<1
e. Nuclear Fuel Cycle	<1
Approximate Total	360

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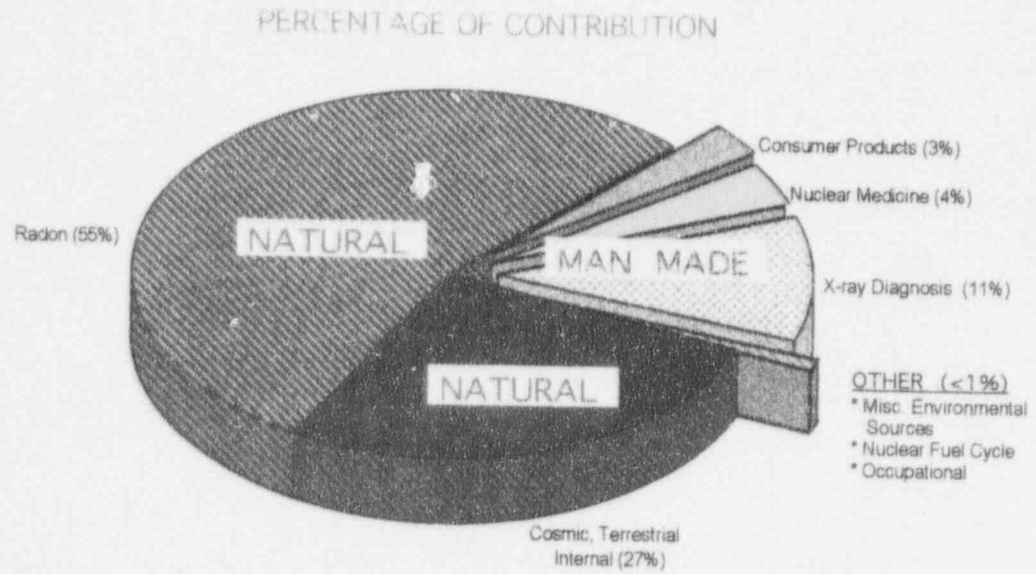


FIGURE 1: DOSE CONTRIBUTIONS TO THE U.S. POPULATION FROM PRINCIPAL SOURCES OF RADIATION EXPOSURE

Smaller doses from man-made sources come from consumer products (e.g., television, smoke detectors, fertilizers), fallout from prior nuclear weapons tests, and production of nuclear power and its associated fuel cycle.

"Fallout" commonly refers to the radioactive debris that settles to the surface of the earth following the detonation of nuclear weapons. Fallout is dispersed throughout the environment but can be washed down to the Earth's surface by rain or snow.

Radionuclides Found in Fallout

Iodine-131	(I-131)	Strontium-90	(Sr-90)
Strontium-89	(Sr-89)	Cesium-137	(Cs-137)

There are approximately two hundred radionuclides produced in the nuclear weapon detonation process; a number of these are detected in fallout. The radionuclides found in fallout that produce most of the fallout radiation exposures to man are iodine-131, strontium-89, strontium-90, and cesium-137.

C. DESCRIPTION OF THE CLINTON POWER STATION

The Clinton Power Station is located in Harp Township, DeWitt County, Illinois. It is approximately six miles east of Clinton, Illinois.

The station, its V-shaped cooling lake, and the surrounding Illinois Power Company-owned land encloses 14,_32 acres. This includes the 4,895-acre, man-made cooling lake and about 90 acres of privately owned property. The plant is sited on approximately 150 acres on the northern arm of the lake. The cooling water discharge flume, which discharges to the eastern arm of the lake, occupies an additional 130 acres. Although the nuclear reactor, supporting equipment, and associated electrical generation and distribution equipment lie in Harp Township, portions of the 14,182 acres lie in Wilson, Rutledge, DeWitt, Creek, Nixon and Santa Anna Townships.

The cooling lake was formed by constructing an earthen dam near the confluence of Salt Creek and the North Fork of Salt Creek. The resulting lake has an average depth of 15.6 feet, and includes an ultimate heat sink of about 590 acre feet. The ultimate heat sink provides sufficient water volume and cooling capacity for approximately thirty days of operation without makeup water.

Through arrangements with the Illinois Department of Conservation, Clinton Lake and much of the area immediately adjacent to the lake are used for public recreation activities, including swimming, boating, water-skiing, hunting and fishing. Recreational facilities exist at Clinton Lake and accommodate up to 11,460 people per day during peak usage periods. The outflow from Clinton Lake falls into Salt Creek and flows in a westerly direction for about 56 miles before joining the Sangamon River. The Sangamon River drains into the Illinois River which enters the Mississippi River near Grafton, Illinois. The nearest use of downstream water for drinking purposes is 242 river miles downstream of Clinton Lake at Alton, Illinois, as verified from the Illinois Environmental Protection Agency Public Water Service. Although some farms in the Salt Creek drainage area downstream of Clinton Lake use irrigation, the irrigation water is drawn from wells, not from the waters of Salt Creek.

Approximately 810,000 individuals live within 50 miles of the Clinton Power Station. Over half are located in the major metropolitan centers of Bloomington-Normal (located about 23 miles north northwest), Champaign-Urbana (located about 31 miles east), Decatur (located about 22 miles south southwest) and Springfield (located about 48 miles west southwest). The nearest city is Clinton, the county seat of DeWitt County. The estimated population of Clinton is about 8,000 people. Outside of the urban areas, most of the land within 50 miles of the Clinton Power Station is used for farming. The principal crops grown are corn and soybeans.

D. *NUCLEAR REACTOR OPERATIONS*

The fuel of a nuclear reactor is made of the element uranium in the form of uranium oxide. The fuel produces power by the process called "fission". In fission, the uranium atom absorbs a neutron and splits to produce fission products, heat, radiation and free neutrons. The free neutrons travel in the reactor core and further absorption of neutrons by uranium permits the fission process to continue. As the fission process continues, more fission products, radiation, heat and neutrons are produced and a sustained reaction occurs. The heat produced is extracted from the fuel to produce steam that drives a turbine generator to produce electricity.

The fission products are predominantly radioactive. They are unstable elements that emit radiation as they change from unstable to stable elements. Neutrons that are not absorbed by the uranium fuel may be absorbed by stable atoms in the materials that make up the components and structures of the reactor. In such cases, stable atoms often become radioactive. This process is called "activation" and the radioactive atoms which result are called "activation products".

Fission Products		*Activation Products*	
Cesium-134	(Cs-134)	Cobalt-60	(Co-60)
Cesium-137	(Cs-137)	Manganese-54	(Mn-54)
Ruthenium-106	(Ru-106)	Iron-55	(Fe-55)
Barium-140	(Ba-140)	Iron-59	(Fe-59)
Cerium-144	(Ce-144)	Zinc-65	(Zn-65)
Strontium-89	(Sr-90)	Tritium	(H-3)

The reactor at the Clinton Power Station is a boiling water reactor (BWR). Figure 2 provides a basic plant schematic for the Clinton Power Station and shows the separation of the cooling water from plant systems. In this type of reactor the fuel is formed into small ceramic pellets that are loaded into sealed fuel rods.

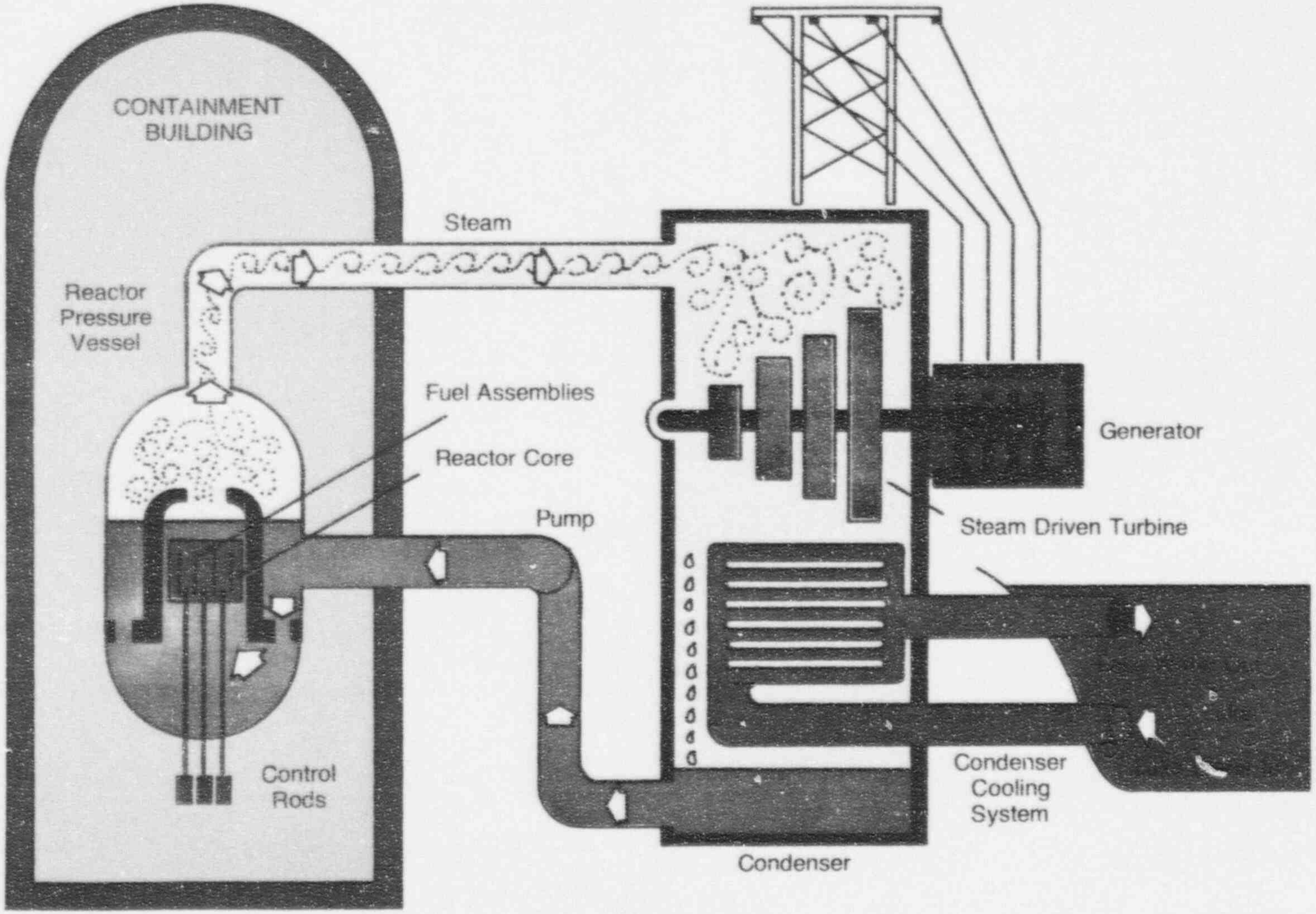


FIGURE 2: CLINTON POWER PLANT BASIC PLANT SCHEMATIC

The fuel rods are arranged in arrays called bundles that are supported within a massive steel reactor vessel.

The spaces between the fuel rods are filled with water. The heat released during the fission of fuel atoms is transferred to the water surrounding the fuel rods. A type of pump that contains no moving parts (a jet pump), and recirculation pumps are used to force the water to circulate through the fuel bundles to assure even cooling of the fuel rods. As the water absorbs heat from the fuel rods some of it is changed to steam. The steam is used to drive a turbine which is coupled to a generator, thereby completing the conversion of the energy released during fission to electricity.

After the steam passes through the turbine it is condensed back to water and returned to the reactor vessel to repeat the process. As the water circulates through the reactor pressure vessel, corrosion allows trace quantities of the component and structure surfaces to get into the water. The corroded material also contains radioactive substances known as activated corrosion products. Radioactive fission and activation products are normally confined to the primary system although small leaks from the primary system may occur.

E. CONTAINMENT OF RADIOACTIVITY

During operating conditions, essentially all radioactivity is contained within the first of several barriers that collectively prevent escape of radioactivity to the environment.

The fuel cladding (metal tubes) provides the first barrier. The ceramic fuel pellets are sealed within zircaloy metal tubes. There is a small gap between the fuel and the cladding where the noble gases and volatile nuclides collect.

The reactor pressure vessel and the steel piping of the primary coolant system provide the second barrier. The reactor pressure vessel is a seventy-foot high vessel with steel walls ranging from four to seven inches thick which encase the reactor core. The reactor pressure vessel and the steel piping provide containment for all radionuclides in the primary coolant.

The Containment Building provides the third barrier. The Containment Building has steel-lined, four-foot-thick reinforced concrete walls which completely enclose the reactor pressure vessel and vital auxiliary equipment. This structure provides a third line of defense against the uncontrolled release of radioactive materials to the environment. The massive concrete walls also serve to absorb much of the radiation emitted during reactor operation or from radioactive materials created during reactor operations.

F. SOURCES OF RADIOACTIVE EFFLUENTS

In an operating nuclear power plant, most of the fission products are retained within the fuel and fuel cladding. However, the fuel manufacturing process leaves traces of uranium on the exterior of the fuel tubes. Fission products from the eventual fission of these traces may be released to the primary coolant. Other small amounts of radioactive fission products are able to diffuse or migrate through the fuel cladding and into the primary coolant. Trace quantities of the corrosion products from component and structural surfaces that have been activated, also get into the primary coolant.

Many soluble fission and activation products such as radioactive iodines, strontiums, cobalts and cesiums are removed by demineralizers in the water purification systems. The noble gas fission products, activated atmospheric gases introduced with reactor feedwater, and some of the volatile fission products such as iodine and bromine, are carried from the reactor pressure vessel to the condenser with the steam.

The steam jet air ejectors or the condenser vacuum pump remove the gases from the condenser and transfer them to the off-gas treatment system. In the off-gas treatment system, the gases are held up by adsorption on specially treated charcoal beds to allow the radioactive gases to decay before they are released through the main ventilation exhaust stack.

Small releases of radioactive liquids from valves, piping, or equipment associated with the primary coolant system may occur in the Containment, Auxiliary, Turbine, RadWaste and Fuel Buildings. The noble gases become part of the gaseous wastes while the remaining radioactive liquids are collected in sumps and processed for reuse. Processed primary coolant water that does not meet chemical specifications for reuse may also become waste water. These represent the principal sources of liquid effluents.

Table 2 summarizes the composition of radioactive gaseous effluents released from the Clinton Power Station during 1995. **There were no liquid radioactive effluents released during 1995.** The highest calculated total body dose received by a member of the public due to the release of these radioactive materials was 0.00313 mrem. This is compared to the 93 mrem per year received in Central Illinois due to natural background radiation.

TABLE 2

1995 RADIONUCLIDE COMPOSITION OF CPS EFFLUENTS[a]

Radionuclide	Half-life	Gaseous Effluents (Curies)
Gross Alpha	NA	0.000219
Tritium (H-3)	12.3 years	15.4
Iron-59	2.7 years	0.0000566
Chromium-51	27.7 days	0.00348
Manganese-54	312.7 days	0.000203
Cobalt-58	70.8 days	0.0000844
Cobalt-60	5.3 years	0.000120
Yttrium-91m	49.71 minutes	0.00106
Technetium-99m	6.0 hours	0.0948
Sodium-24	15.0 hours	0.00183
Strontium-89	50.6 days	0.0000516
Cesium-138	32.2 minutes	0.0224
Barium-139	83.1 minutes	0.0143
Xenon-135	9.11 hours	0.152
Iodine-131	8.0 days	0.0000975
Iodine-133	20.8 hours	0.000824
Total		**16.7**

(a) There were no liquid radioactive effluents released during 1995.

G. *RADIOACTIVE WASTE PROCESSING*

In a normal operating nuclear power plant, radioactive liquid and gaseous wastes are collected, stored and processed through treatment systems to remove or reduce most of the radioactivity (excluding tritium) prior to reuse within the plant or discharge to the environment. These processing systems are required by the Clinton Power Station Offsite Dose Calculation Manual to be installed and operable to help ensure all releases of radioactive liquid and gaseous effluents are As Low As Reasonably Achievable (ALARA).

The liquid waste treatment systems consist of filters, demineralizers and evaporators. Liquid wastes are routed through the waste evaporators to be degassed and distilled thereby reducing their volume and concentrating their radioactivity. The distillates are further treated through demineralizers and filters and transferred to the waste evaporator condensate storage tanks. Liquid wastes are processed through the appropriate portions of the liquid waste treatment system to provide assurance that the releases of radioactive materials in liquid effluents will be kept ALARA.

Liquid wastes are discharged into the plant cooling water stream which varies from approximately 5,000 gallons per minute, when the plant is in shutdown, to 567,000 gallons per minute, when the plant is at full power. The liquid effluents are thoroughly mixed with and diluted by the plant cooling water as it travels the 3.4 miles of the discharge canal before it enters Clinton Lake east of DeWitt County Road 14.

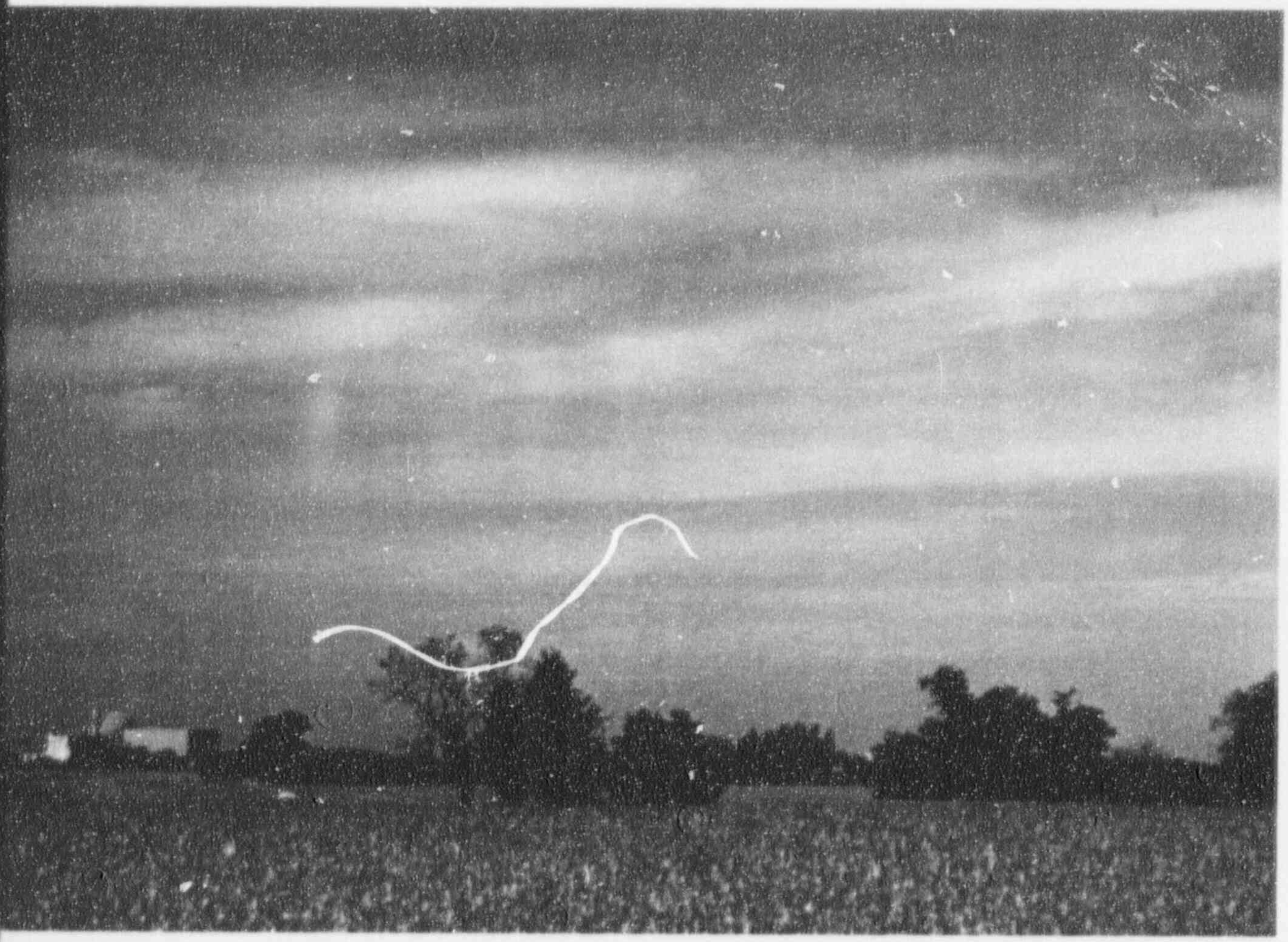
The Clinton Power Station Offsite Dose Calculation Manual requires that liquid effluents not contain a higher concentration of any radioisotope than that which is set for continuous exposure to the general public. This condition is satisfied at the point the liquid effluent is first introduced into the cooling water flow. The additional dilution that occurs in the cooling water canal reduces the concentrations of radioisotopes to between 1/73 (for minimum flow) and 1/1890 (for maximum flow) of their original value before the water enters Clinton Lake.

The concentrated radioactive solids captured in the liquid waste treatment system are processed and stored on-site or shipped off-site for disposal at licensed low-level waste disposal facilities.

The gaseous effluents from the main condenser are held up in the off-gas charcoal beds for at least 46 hours. This provides time for the decay of most of the radionuclides present since most have a half-life of less than 8 hours. If gaseous effluents in the ventilation exhaust system for the Containment Building and for the Secondary Containment structure exceed conservatively set levels, they are processed through charcoal beds and high efficiency particulate air filters in the Standby Gas Treatment System before being discharged to the environment.

This combination of filters and charcoal beds is rated to be 95% efficient for removing iodines and greater than 99% efficient for removing particulate material larger than one micron (one millionth of an inch) in diameter.

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM



RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

III.

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

A. PROGRAM DESCRIPTION

The Clinton Power Station is required to maintain a radiological environmental monitoring program in accordance with the Code of Federal Regulations (CFR) Title 10, Section 20.1501 and Criterion 64 of CFR Title 10, Part 50, Appendix A. The program was developed using the following guidance published by the United States Nuclear Regulatory Commission (USNRC):

⇒ Regulatory Guide 4.1, "Programs for Monitoring Radioactivity in the Environs of Nuclear Power Plants"

⇒ USNRC Radiological Assessment Branch Technical Position on Radiological Environmental Monitoring (1979)

The Radiological Environmental Monitoring Program is an extensive program of sampling, measuring and analyzing that was instituted to monitor the radiological impact of reactor operation on the environment. Objectives of the program include:

◊ identification, measurement and evaluation of existing radionuclides in the environs of the Clinton Power Station and fluctuations in radioactivity levels which may occur

◊ evaluation of the measurements to determine the impact of Clinton Power Station operations on the local radiation environment

◊ collection of data needed to refine environmental radiation transport models used in offsite dose calculations

◊ verification that radioactive material containment systems are functioning to minimize environmental releases to levels that are ALARA

◊ demonstration of compliance with regulations and the Clinton Power Station Offsite Dose Calculation Manual.

Implicit in these objectives are the requirements to trend and assess radiation exposure rates and radioactivity concentrations in the environment that may contribute to radiation exposure to the public. The program consists of two phases, preoperational (preop) and operational.

The preoperational portion of the program was initiated in May, 1980 and was completed on February 27, 1987 to establish the baseline for the local radiation environment. Assessment of the operational impact of the Clinton Power Station on the radiation environment is based on data collected since the beginning of reactor operation. The operational phase implements confirmatory measurements to verify that the in-station controls for the release of radioactive material are functioning as designed.

Illinois Power Company maintains a contract with Teledyne Brown Engineering Environmental Services Midwest Laboratory (TBEESML), formerly Teledyne Isotopes Midwest Laboratory (TIML), for analysis of all radiological environmental samples. TBEESML is located in Northbrook, Illinois. Samples are collected by Illinois Power Company personnel and shipped to TBEESML for analysis. After analysis, environmental samples are saved at TBEESML for a specified period of time in case additional analysis is required. Analytical results are reported monthly to company radiation protection personnel.

Current regulatory guidance recommends evaluating direct pathways, or the highest trophic level in a dietary pathway, that contribute to an individual's dose. Figure 3 shows the basic pathways of gaseous and liquid radioactive effluents to an individual. The "important pathways" selected are based primarily on how radionuclides move through the environment and eventually expose individuals, as well as man's use of the environment. The scope of the program includes the monitoring of five environmental compartments:

- direct radiation
- atmospheric
- aquatic
- terrestrial environments
- ground and surface water.

Each pathway is monitored at "indicator" and "control" locations. Indicator locations are generally within the 10-mile radius of the station. Control locations are located at least ten miles from the plant, far enough to be unaffected by plant operations. An increase in dose rate or radioactive material concentration at an indicator location may be due to plant operations.

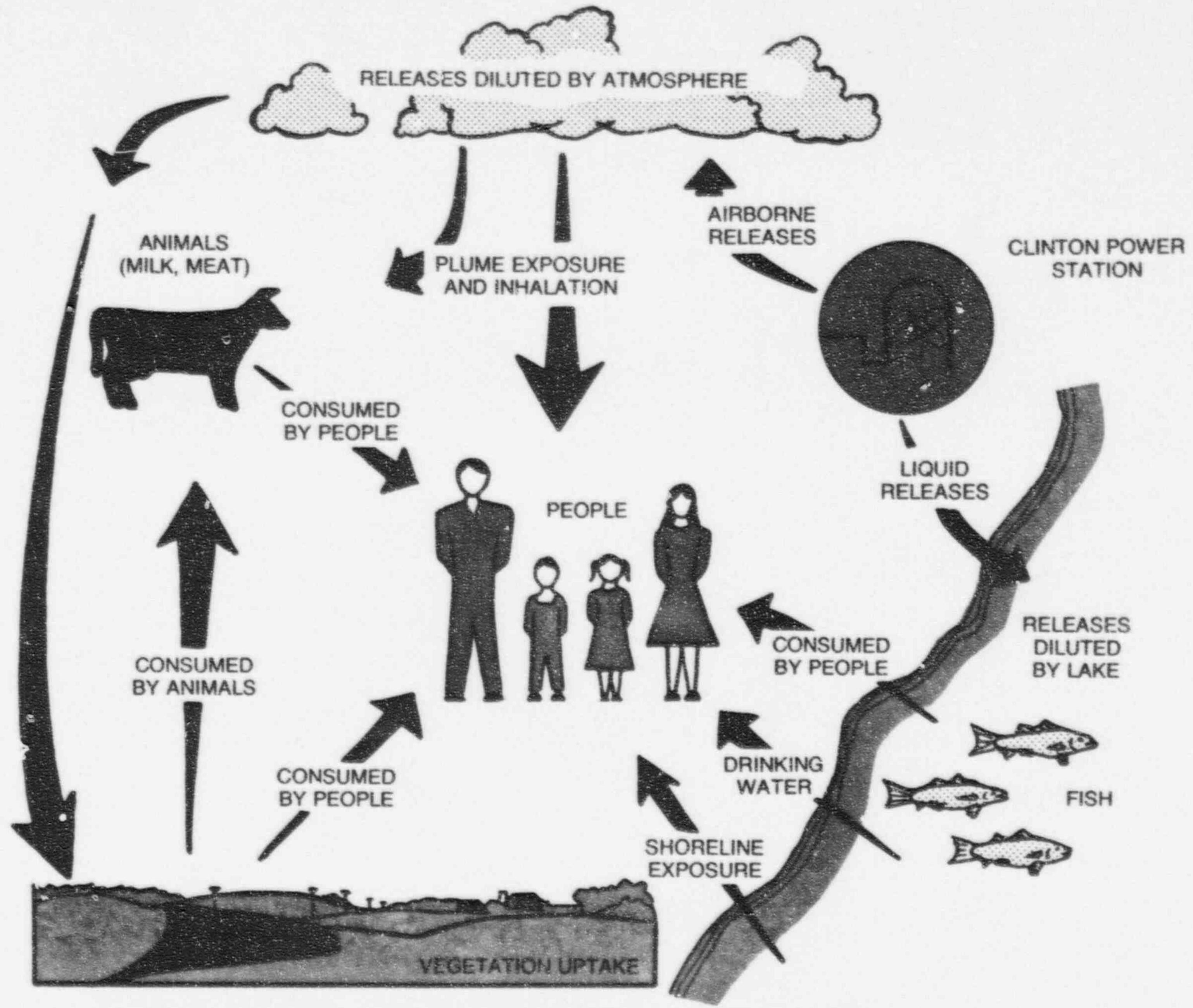


FIGURE 3: POTENTIAL EXPOSURE PATHWAYS OF MAN DUE TO RELEASE OF RADIOACTIVE MATERIAL TO THE ENVIRONMENT

Locations of sampling stations are shown on maps in Figures 4 through 7. Table 3 provides a list of the sample codes for each sample medium. Table 4 provides information on sample location, media sampled at each location, and a brief description of each location where samples are taken. The location is listed according to distance (in miles) and the compass sector relative to the Station Heating, Ventilation and Air Conditioning (HVAC) stack.

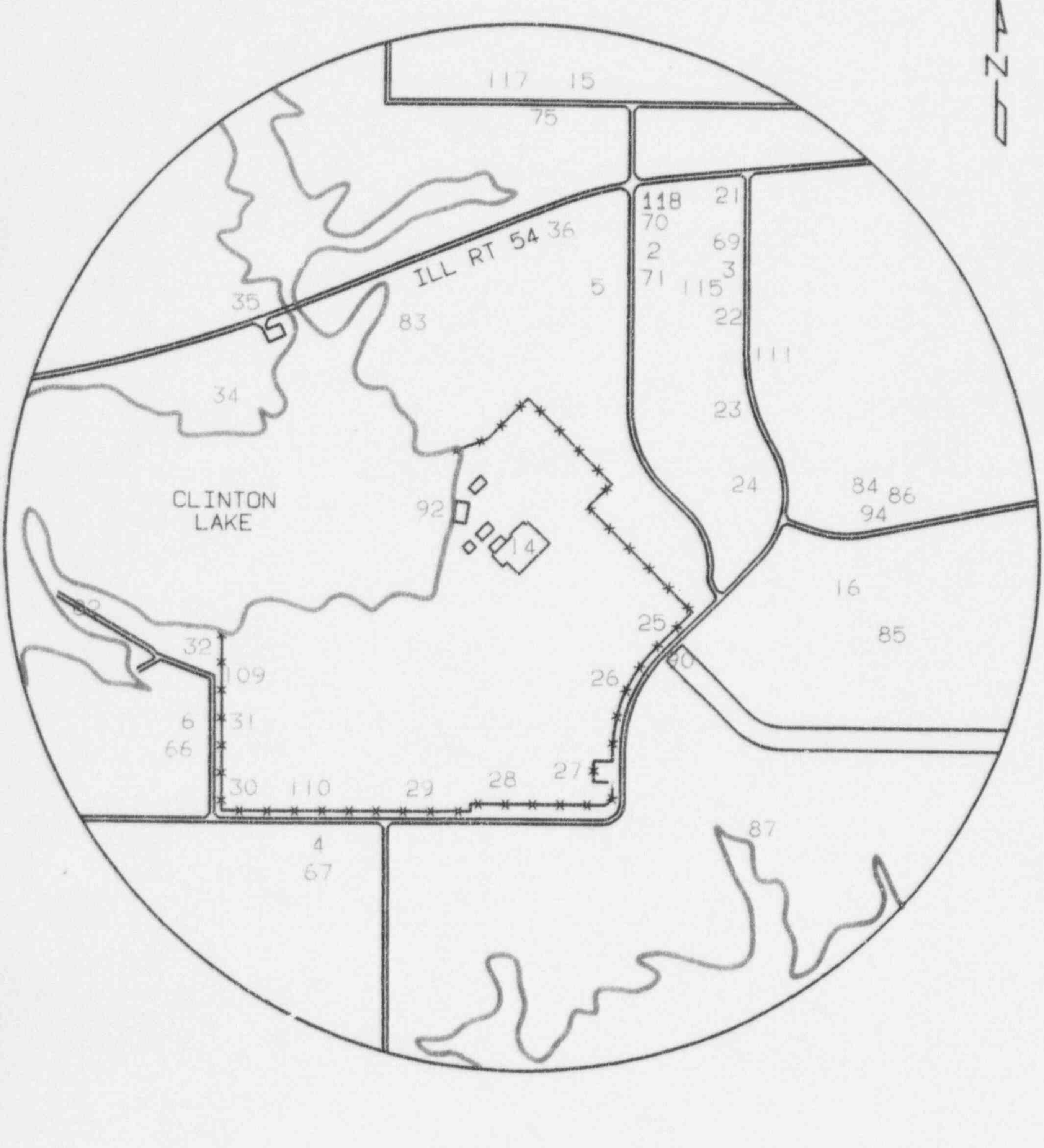


FIGURE 4: REMP SAMPLE LOCATIONS WITHIN 1 MILE

M.0234
3-8-

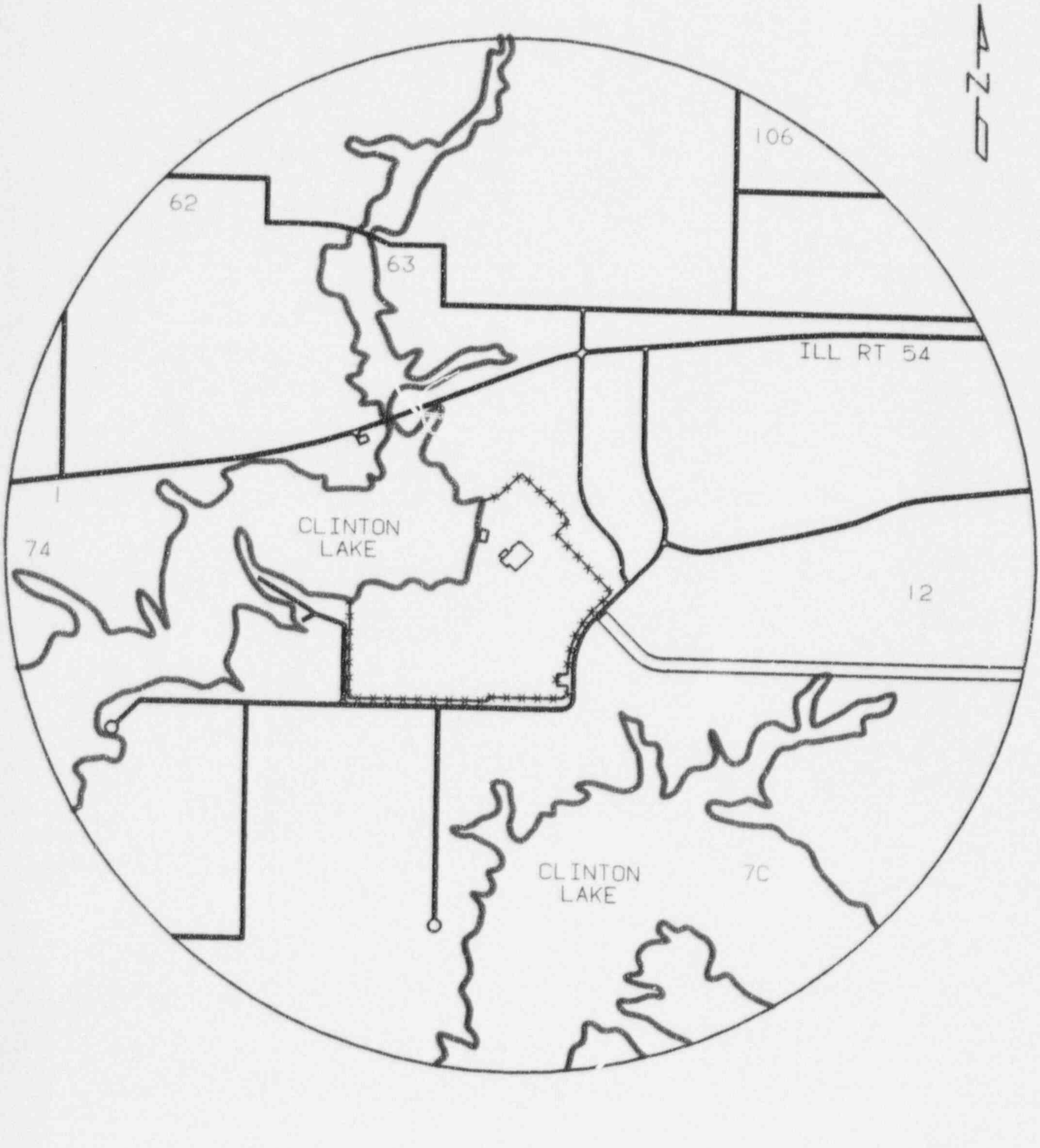


FIGURE 5: REMP SAMPLE LOCATIONS FROM 1 - 2 MILES

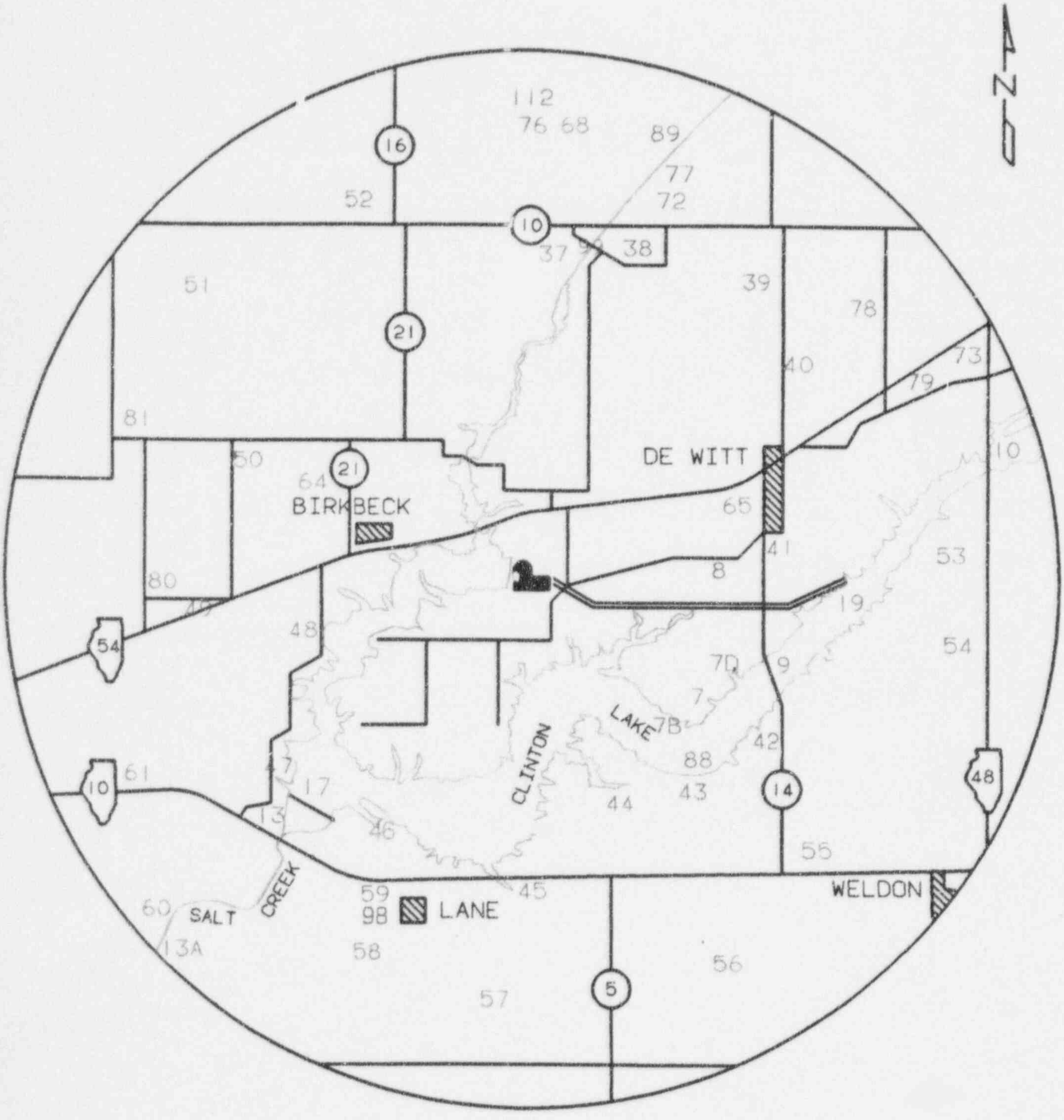


FIGURE 6: REMP SAMPLE LOCATIONS FROM 2 - 5 MILES

M,023
3-8

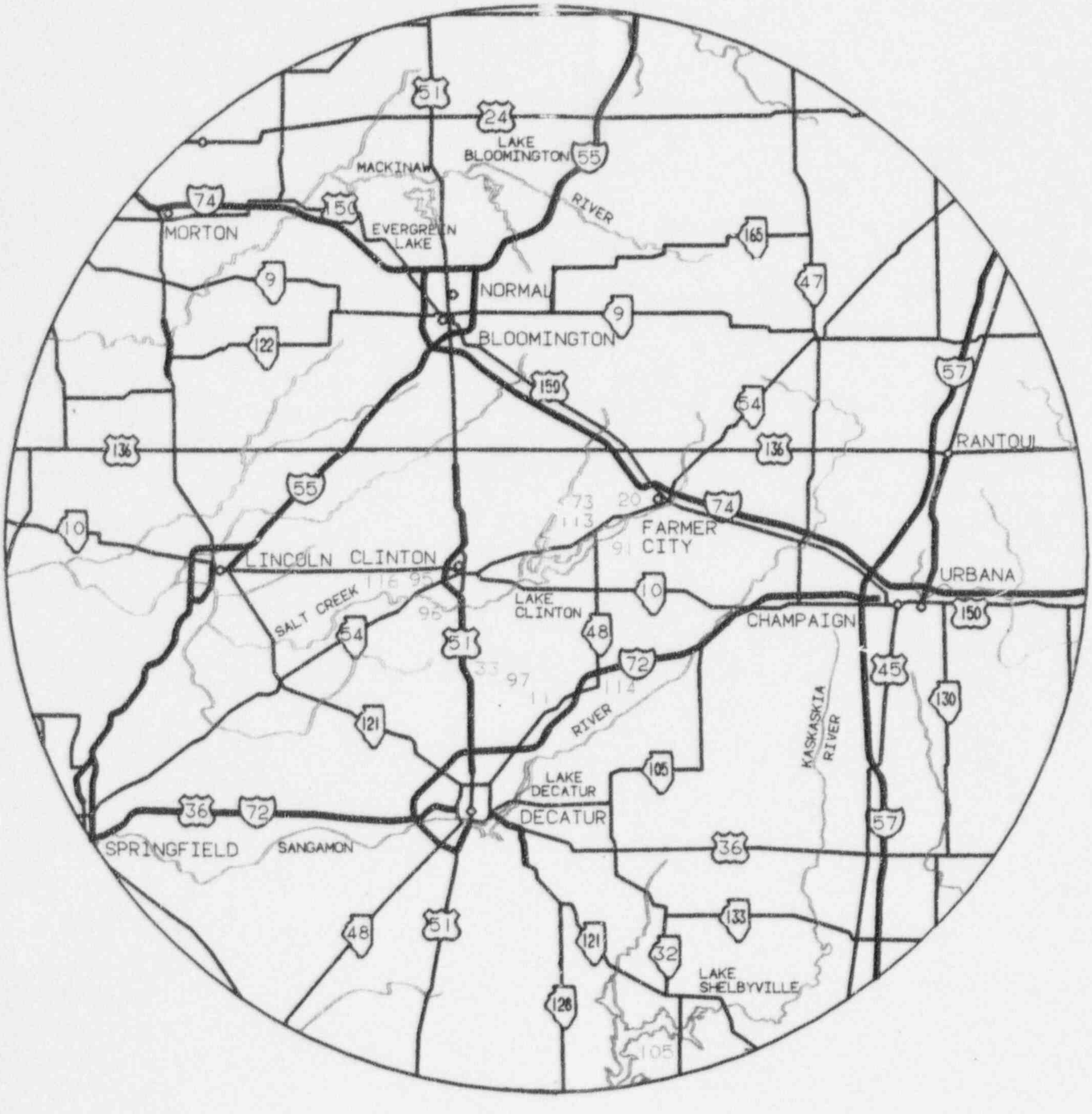


FIGURE 7: REMP SAMPLE LOCATIONS GREATER THAN 5 MILES

M.02349E
1-27-92

TABLE 3
CLINTON POWER STATION SAMPLE CODES

CODE	***SAMPLE MEDIUM***
AP	Airborne Particulate
AI	Airborne Iodine
TLD	Direct Radiation
M	Milk
DW	Drinking Water
SW	Surface Water
WW	Well Water
VE	Green Leafy Vegetables
F	Fish
SL	Slime or Aquatic Vegetation
BS	Bottom Sediments
SS	Shoreline Sediments
SO	Soil
ME	Meat
G	Grass

TABLE 4

REMP SAMPLE LOCATIONS*

Station Code	Sample Medium	Location	Description
CL-1	AP,AI,TLD,SO,G	1.8 miles W	Near the gate to Camp Quest, S of Birkbeck
CL-2	AP,AI,TLD,SO,G	0.7 miles NNE	Located on site's main access road. Collocated with CL-70 and CL-71.
CL-3	AP,AI,TLD,SO	0.7 miles NE	Located on site's secondary access road. Collocated with CL-69.
CL-4	AP,AI,TLD,SO	0.8 miles SW	Located on farm SE of Illinois Power Recreation Area. Collocated with CL-67.
CL-5	TLD	0.7 miles NNE	Located on site's main access road
CL-6	AP,AI,TLD,SO	0.8 miles WSW	Located near the Illinois Power Recreation Area softball field. Collocated with CL-66.
CL-7	AP,AI,TLD,SO	2.3 miles SE	Located in the Mascoutin State Recreation Area
CL-7B	SS,SL	2.1 miles SE	SE of site on Clinton Lake
CL-7C	BS,SL,SS	1.3 miles SE	SE of site on Clinton Lake
CL-7D	WW	2.3 miles ESE	Located in Illinois Power Department of Conservation office at the Mascoutin State Recreation Area
CL-8	AP,AI,TLD,SO,G	2.2 miles E	Located at DeWitt Cemetery
CL-9	SW,SL	2.7 miles ESE	Located on NE side of DeWitt County Route 14 bridge
CL-10c	SW(1),BS,SS,SL	5.0 miles ENE	Located on SE side of Illinois Route 48 bridge
CL-11c	AP,AI,TLD,SO,G	16 miles S	Located SW of Argenta at the Illinois Power Substation
CL-12	WW	1.6 miles E	Located at the DeWitt pumphouse
CL-13	SW	3.6 miles SW	Located near the Salt Creek bridge on Illinois Route 10
CL-13A	BS	5.0 miles SW	Located on Salt Creek at the Route 1300E bridge
CL-14	DW	Plant Service Building	Located in the Plant Service Building

TABLE 4 (Cont'd)

Station Code	Sample Medium	Location	Description
CL-15	AP,AI,TLD	0.9 miles N	Located north of CPS on Route 900N
CL-16	SO	0.6 miles ESE	Located ESE of CPS just north of discharge flume
CL-17	BS	3.5 miles SW	Located on the lake side of Clinton Lake dam
CL-19	F,BS,SS,SL	3.4 miles E	Located E of site at the end of the discharge flume
CL-20	TLD	9.1 miles ENE	Located at the Campground Cemetery W of Farmer City
CL-21	TLD	0.9 miles NNE	Located at the intersection of Illinois Route 54 and the site's secondary access road
CL-22	TLD	0.6 miles NE	Located on the site's secondary access road
CL-23	TLD	0.5 miles ENE	Located on the site's secondary access road
CL-24	TLD	0.5 miles E	Located on the site's secondary access road
CL 25	TLD	0.4 miles ESE	Located on the Owner Controlled Area fence
CL-26	TLD	0.3 miles SE	Located on the Owner Controlled Area fence
CL-27	TLD	0.6 miles SSE	Located on the Owner Controlled Area fence near the Meteorological Tower
CL-28	TLD	0.5 miles S	Located on the Owner Controlled Area fence
CL-29	TLD	0.6 miles SSW	Located on the Owner Controlled Area fence
CL-30	TLD	0.7 miles SW	Located on the Owner Controlled Area fence at the entrance to Illinois Power Recreation Area
CL-31	TLD	0.8 miles WSW	Located on the Owner Controlled Area fence near the Illinois Power Recreation Area softball field
CL-32	TLD	0.7 miles WSW	Located on the Owner Controlled Area fence near Clinton Lake
CL-33c	TLD	11.7 miles SW	Located in Maroa at family residence

TABLE 4 (Cont'd)

Station Code	Sample Medium	Location	Description
CL-34	TLD	0.8 miles WNW	Located near CPS Visitors Center
CL-35	TLD	0.7 miles NW	Located near CPS Visitors Center near Illinois Route 54 bridge
CL-36	TLD	0.6 miles N	Located on Illinois Route 54 near intersection with site's main access road
CL-37	TLD	3.4 miles N	Located N of site
CL-38	TLD	3.6 miles NNE	Located near microwave tower N of site
CL-39	TLD	3.8 miles NE	Located 2 miles N of DeWitt
CL-40	TLD	3.5 miles NE	Located 0.6 miles N of DeWitt
CL-41	TLD	2.4 miles E	Located at S DeWitt city limit
CL-42	TLD	2.8 miles ESE	Located S of DeWitt County Route 14 bridge
CL-43	TLD	2.8 miles SE	Located on Clinton Marina access road
CL-44	TLD	2.3 miles SSE	Located near Clinton Marine Boat Sales
CL-45	TLD	2.8 miles S	Located at Lane Day Use Area
CL-46	TLD	2.8 miles SSW	Located at Peninsula Day Use Area
CL-47	TLD	3.3 miles SW	Located near Clinton Lake Dam Access Road
CL-48	TLD	2.3 miles WSW	Located at residence on West Side Access Road
CL-49	TLD	3.5 miles W	Located W of site along Illinois Route 54
CL-50	TLD	3.2 miles WNW	Located WNW of site
CL-51	TLD	4.4 miles NW	Located NW of site
CL-52	TLD	4.3 miles NNW	Located NNW of site
CL-53	TLD	4.3 miles E	Located E of site
CL-54	TLD	4.6 miles ESE	Located 2 miles N of Weldon
CL-55	TLD	4.1 miles SE	Located 1.5 miles W of Weldon
CL-56	TLD	4.1 miles SSE	Located SSE of site

TABLE 4 (Cont'd)

Station Code	Sample Medium	Location	Description
CL-57	TLD	4.6 miles S	Located S of site
CL-58	TLD	4.3 miles SSW	Located in rural Lane
CL-59	TLD	3.3 miles SSW	Located near Lane city limit
CL-60	TLD	4.5 miles SW	Located SW of Clinton Lake Dam near Salt Creek
CL-61	TLD	4.5 miles WSW	Located WSW of site
CL-62	TLD	1.9 miles NW	Located NW of site
CL-63	TLD	1.3 miles NNW	Located at North Fork Boat Access
CL-64	TLD	2.1 miles WNW	Located 0.5 miles N of Birkbeck
CL-65	TLD	2.6 miles ENE	Located at residence in DeWitt
CL-66	TLD	0.8 miles WSW	Located near the Illinois Power Recreation Area softball field. Collocated with CL-6.
CL-67	TLD	0.8 miles SW	Located on farm SE of Illinois Power Recreation Area. Collocated with CL-4.
CL-68	TLD	4.6 miles N	Located N of site. Collocated with CL-112.
CL-69	TLD	0.7 miles NE	Located on site's secondary access road. Collocated with CL-3.
CL-70	TLD	0.7 miles NNE	Located on site's secondary access road. Collocated with CL-2 and CL-71.
CL-71	TLD	0.7 miles NNE	Located on site's secondary access road. Collocated with CL-2 and CL-70.
CL-72	TLD	4.5 miles NNE	Located NNE of site. Collocated with CL-77.
CL-73	TLD	5.1 miles ENE	Located near the MidAmerica Commodities plant on Illinois Route 48. Collocated with CL-113.
CL-74	TLD	1.9 miles W	Located at Camp Quest
CL-75	TLD	0.9 miles N	Located N of site
CL-76	TLD	4.6 miles N	Located N of site
CL-77	TLD	4.5 miles NNE	Located NNE of site. Collocated with CL-72.

TABLE 4 (Cont'd)

Station Code	Sample Medium	Location	Description
CL-78	TLD	4.8 miles NE	Located NE of site
CL-79	TLD	4.5 miles ENE	Located ENE of site
CL-80	TLD	4.1 miles W	Located W of site
CL-81	TLD	4.5 miles WNW	Located WNW of site
CL-82	TLD	0.9 miles W	Located at Illinois Power Recreation Area
CL-83	TLD	0.5 miles NNW	Located near Illinois Route 54 E of the bridge
CL-84	TLD	0.6 miles E	Located on Old Clinton Road between DeWitt and site. Collocated with CL-94 and CL-86.
CL-85	TLD	0.6 miles ESE	Located ESE of site
CL-86	TLD	0.6 miles E	Located on Old Clinton Road between DeWitt and site. Collocated with CL-84 and CL-94.
CL-87	TLD	0.6 miles SE	Located near discharge flume road
CL-88	SS	2.4 miles SE	Located SE of site
CL-89	BS,SS	3.6 miles NNE	Located NNE of site
CL-90	SW	0.4 miles SE	Located at start of discharge flume
CL-91	SW	6.1 miles ENE	Located at Parnell Boat Access
CL-92	SW	0.1 miles NW	Located at CPS Intake Screenhouse
CL-94	AP,AI,SO	0.6 miles E	Located on Old Clinton Road between DeWitt and site. Collocated with CL-84 and CL-86.
CL-95c	TLD	10.5 miles W	Located at a family residence west of Clinton
CL-96c	TLD	10.9 miles WSW	Located at a family residence SW of Clinton
CL-97c	TLD	10.3 miles SSW	Located on Macon County Road 1400E SE of Maroa
CL-98	M	3.7 miles SSW	Located at a family residence SSW of site
CL-99	SW	3.5 miles NNE	Located at the North Fork Canoe Access Area
CL-105c	F,SS,BS,SL	50 miles S	Located at Lake Shelbyville

TABLE 4 (Cont'd)

Station Code	Sample Medium	Location	Description
CL-106	ME	2.0 miles NNE	Located NNE of site
CL-109	TLD	0.7 miles WSW	Located on the Owner Controlled Area fence near Shooting Range
CL-110	TLD	0.8 miles SW	Located on the Owner Controlled Area fence
CL-111	TLD	0.6 miles NE	Located near site's secondary access road
CL-112	TLD	4.6 miles N	Located N of site. Collocated with CL-68.
CL-113	TLD	5.1 miles ENE	Located near the MidAmerica Commodities plant on Illinois Route 48. Collocated with CL-73.
CL-114c	VE	12.5 miles SSE	Located S of Cisco
CL-115	VE	0.7 miles NE	Located on site's secondary access road
CL-116c	M,G	14 miles WSW	Located in rural Kenney
CL-117	VE	0.9 miles N	Located N of site
CL-118	VE	0.7 miles NNE	Located on Illinois Route 54 near intersection with main access road

* Sample location is listed by station code, location and number. Station Code is Clinton (CL) - Number (site's number designator). Location is listed by distance in miles and directional sector from the Station HVAC stack.

c Control location; all other locations are indicators.

(1) Control location for surface water only.

B. Direct Radiation Monitoring

Radionuclides present in the air, and those deposited in or on the ground cause human exposure by immersion in the atmosphere or by deposition on the ground. TLDs (thermoluminescent dosimeters) are used to measure the ambient gamma radiation field at many locations around the Clinton Power Station.

TLDs are crystalline devices that store energy when they are exposed to radiation. They can be processed months after exposure with minimal loss of information. This makes them well suited for quarterly environmental radiation measurements.

During processing, the stored energy is released as light and measured by a TLD reader. The light intensity is proportional to the radiation dose the TLD received. The TLDs used in monitoring around the Clinton Power Station are easily capable of measuring environmental levels of radiation, approximately 20 mrem per quarter.

Monitoring stations are placed near the site boundary and approximately five miles from the reactor, in locations representing the sixteen compass sectors. Other locations are chosen to measure the radiation field at places of special interest such as nearby residences, meeting places and population centers.

Control sites are located further than ten miles from the site, in areas that should not be affected by plant operations.

TLD measurements register the gamma ray exposure in milliRoentgen (mR). For reporting purposes mR is numerically equivalent to mrem. Consequently the terms are used interchangeably.

A total of 344 TLD measurements were made in 1995. The average quarterly dose at indicator locations was 17.9 mrem. These quarterly measurements ranged from 11.8 to 25.0 mrem. At control locations the average quarterly dose was 17.8 mrem. These quarterly control measurements ranged from 14.2 to 22.4 mrem.

Figure 8 compares the 1995 quarterly TLD results with preoperational TLD quarterly averages.

Average doses (±2 standard deviations), broken down by calendar quarter, are shown in Table 5 for both indicator and control locations.

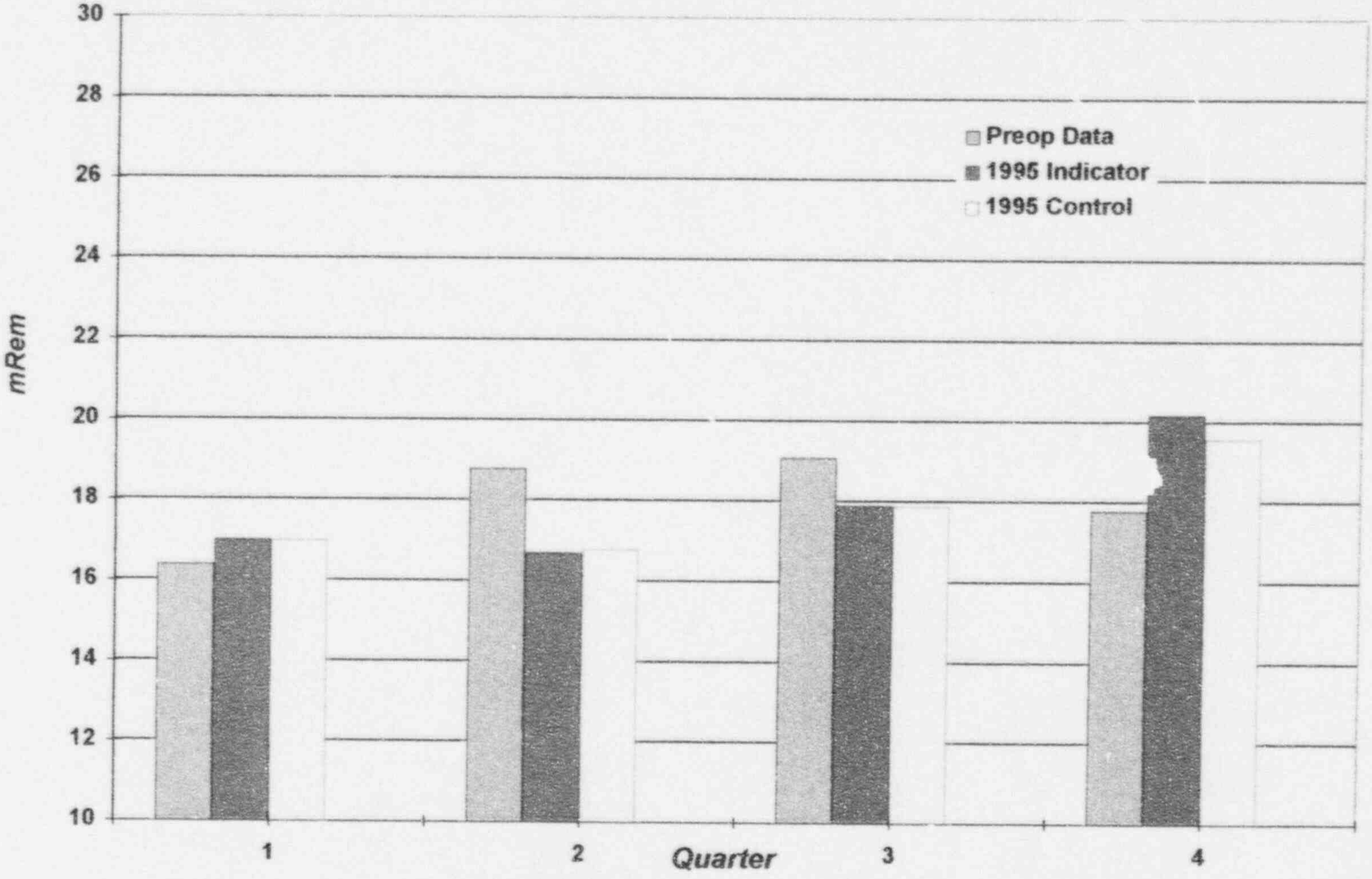


FIGURE 8: DIRECT RADIATION COMPARISON

TABLE 5

AVERAGE QUARTERLY TLD RESULTS

QUARTER	1995 INDICATOR	1994 INDICATOR	PREOP ALL SITES
1st	17.0 ±3.1	17.7 ±2.9	16.4 ±2.9
2nd	16.7 ±2.9	17.7 ±2.9	18.8 ±3.2
3rd	17.9 ±3.5	19.2 ±3.6	19.1 ±4.7
4th	20.2 ±4.2	18.3 ±3.4	17.8 ±2.2

QUARTER	1995 CONTROL	1994 CONTROL	PREOP ALL SITES
1st	17.0 ±3.8	17.6 ±2.4	16.4 ±2.9
2nd	16.8 ±2.8	17.2 ±3.1	18.8 ±3.2
3rd	17.9 ±3.7	19.0 ±3.0	19.1 ±4.7
4th	19.6 ±4.3	17.3 ±2.6	17.8 ±2.2

Site CL-83, located 0.5 miles NNW of the station, registered the highest annualized dose: 82.6 mrem during 1995.

From these observations, no increase in environmental gamma radiation levels resulted from operation of the Clinton Power Station during 1995.

C. Atmospheric Monitoring

The inhalation and ingestion of radionuclides in the air is a direct exposure pathway to man. A network of ten active air samplers around the Clinton Power Station monitors this pathway. There are nine indicator air sampling stations strategically located in areas which are most likely to indicate effects due to the release of radioactive effluents from the Clinton Power Station. The control location is located approximately 16 miles south of the plant in an area which is likely to be independent of the effects of station operations. Historical meteorological data indicates this control location is normally upwind from the plant.

No contribution to the general level of airborne particulate radioactivity could be identified as a result of station operations during 1995. The radioactivity that was detected is normally found in the environment and is consistent with expected concentrations of natural radioactivity and fallout from prior atmospheric nuclear weapons testing.

Mechanical air samplers are used to draw a continuous volume of air through a filter and charcoal cartridge to collect particulates and radioiodines present in the atmosphere. The samplers are equipped with a pressure-sensing flow regulator to maintain a constant sampling flow rate of about one cubic foot per minute. The total volume is calculated based on the amount of time the air sampler ran and its flow rate. The air sampling equipment is maintained and calibrated by the Clinton Power Station personnel using reference standards traceable to the National Institute of Standards and Technology.

Air samples are collected weekly and analyzed for gross beta and I-131 activities. Quarterly, all air particulate filters collected during that period are combined and counted for gamma isotopic activity. Since the intent of particulate sampling is to measure airborne radioactivity released from the plant, the counting of short-lived daughters produced by the decay of natural radon and thoron may mask plant contributions. Therefore, the filters are not analyzed for at least five days after their collection to allow for the decay of the short-lived daughters, thereby reducing their contribution to gross beta activity.

Results of the gross beta airborne particulate analyses provided comparisons between indicator and control locations for the year, as well as comparisons between locations in relation to spatial and temporal differences. The calculated annual average was 0.021 pCi/m^3 for all indicator locations and 0.021 pCi/m^3 for the control location. These results are consistent with the preoperational averages for both indicator and control locations which were 0.027 pCi/m^3.

The location with the highest calculated annual average was indicator station CL-3 located 0.7 miles northeast of the Clinton Power Station. This location had an average concentration of 0.022 pCi/m^3. Individual location averages for the year are presented in Table 6.

Minor fluctuations in the gross beta concentrations were noted throughout the year. The general trend for average weekly gross beta concentrations in the indicator locations correlated to the trend for control locations throughout the monitoring period. This correlation is evidenced by the similarity of the trends in the average monthly gross beta concentrations displayed in Figure 9. No significant difference was indicated between individual locations. Monthly averages for indicator and control locations for the year are presented in Table 7.

All gross beta concentrations for 1995 were within normal background levels and no increases were noted as a result of the operation of the Clinton Power Station.

Naturally occurring Be-7 was the only gamma-emitting radionuclide detected in analyses of particulate filters.

TABLE 6

AVERAGE GROSS BETA CONCENTRATIONS IN AIR PARTICULATES

Station	Description	1994 Average ± 2σ (pCi/m^3)	1995 Average ± 2σ (pCi/m^3)
CL-1	Camp Quest (Birkbeck)	0.019 ± 0.014	0.019 ± 0.014
CL-2	CPS Main Access Road	0.020 ± 0.014	0.020 ± 0.016
CL-3	CPS Secondary Access Road	0.021 ± 0.015	0.022 ± 0.016
CL-4	0.8 miles SW	0.021 ± 0.015	0.021 ± 0.017
CL-6	IP Recreation Area	0.021 ± 0.015	0.021 ± 0.015
CL-7	Mascoutin State Recreation Area	0.017 ± 0.014	0.019 ± 0.015
CL-8	DeWitt Cemetery	0.020 ± 0.014	0.021 ± 0.016
CL-11[a]	IP Substation (Argenta)	0.020 ± 0.013	0.021 ± 0.016
CL-15	0.9 miles N	0.020 ± 0.014	0.020 ± 0.015
CL-94	Old Clinton Road (0.6 miles E)	0.020 ± 0.015	0.021 ± 0.016

(a) Control Station

TABLE 7

AVERAGE MONTHLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATES[a]

Month	1995 Indicator (Average ± 2σ)	1994 Indicator (Average ± 2σ)	1995 Control (Average ± 2σ)	1994 Control (Average ± 2σ)
January	0.022 ±0.002	0.029 ±0.004	0.021 ±0.015	0.029 ±0.006
February	0.022 ±0.003	0.022 ±0.005	0.021 ±0.010	0.022 ±0.002
March	0.018 ±0.004	0.019 ±0.002	0.018 ±0.015	0.017 ±0.003
April	0.014 ±0.002	0.014 ±0.001	0.015 ±0.007	0.015 ±0.003
May	0.011 ±0.002	0.011 ±0.003	0.012 ±0.004	0.011 ±0.006
June	0.017 ±0.004	0.016 ±0.003	0.018 ±0.012	0.019 ±0.006
July	0.020 ±0.003	0.016 ±0.003	0.020 ±0.009	0.018 ±0.006
August	0.023 ±0.004	0.019 ±0.004	0.024 ±0.024	0.018 ±0.007
September	0.025 ±0.003	0.021 ±0.004	0.022 ±0.008	0.021 ±0.012
October	0.025 ±0.004	0.019 ±0.003	0.025 ±0.020	0.019 ±0.004
November	0.023 ±0.004	0.020 ±0.002	0.028 ±0.014	0.021 ±0.003
December	0.026 ±0.004	0.033 ±0.004	0.027 ±0.018	0.032 ±0.013

[a] concentrations are in pCi/m^3

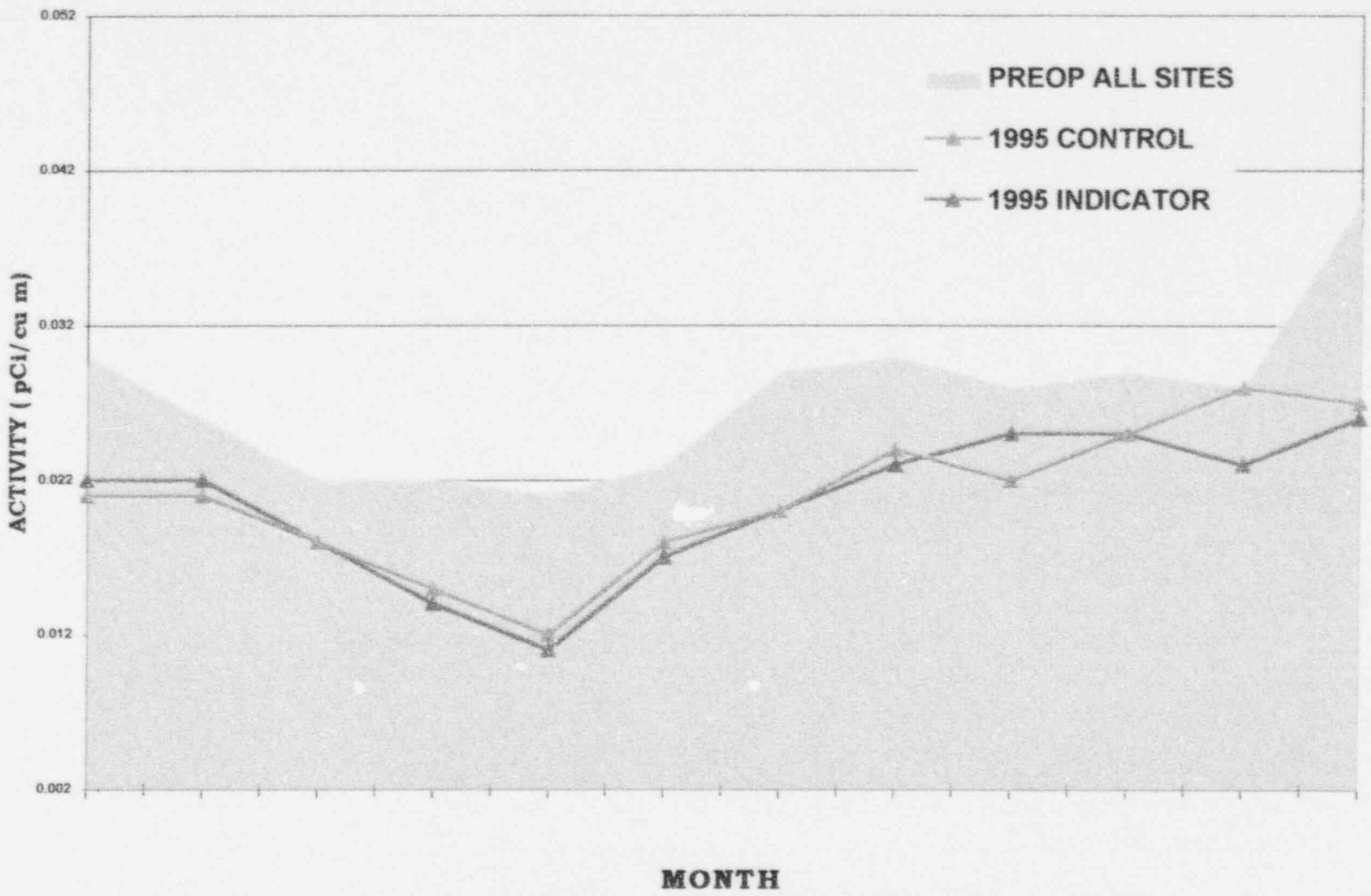


FIGURE 9: AIR PARTICULATE GROSS BETA ACTIVITY COMPARISON

D. Aquatic Monitoring

The Clinton Power Station utilizes a man-made lake as the source of cooling water and returns the used cooling water to the same lake while most nuclear power stations use once-through flow from a river, the ocean or a body of water much larger than Clinton Lake. When radioactive liquid effluents are discharged from the Clinton Power Station into the cooling water outfall, radioisotopes with long half-lives could build up as the same water is reused on successive trips through the plant. This water travels from the plant, into the eastern arm of the lake, then into the northern arm of the lake and back into the plant. Although the only user of Clinton Lake as a source of drinking water is the Clinton Power Station, the lake is a major recreational facility, used for fishing, swimming, water skiing, boating and hunting.

Clinton Lake constitutes the primary environmental exposure pathway for radioactive materials in liquid effluents. Aquatic monitoring provides for the collection of fish, shoreline and bottom sediments, and periphyton samples to detect the presence of any radioisotopes related to operation of the Clinton Power Station. These samples are analyzed for naturally occurring and man-made radioactive materials. Both indicator and control locations were sampled during 1995. Indicator samples were taken from various locations on Clinton Lake and the control samples were taken at Lake Shelbyville which is approximately 50 miles south of Clinton Power Station.

Aquatic monitoring samples are collected by personnel from the Field Biology Laboratory of the Environmental Resources Department of Illinois Power Company.

Fish

Samples of fish are collected from Clinton Lake and Lake Shelbyville. In both lakes the samples include largemouth bass, crappie, carp and bluegill. These species are the fish most commonly harvested from the lakes by sport fishermen. Fish ingest sediments during bottom feeding, or prey on other organisms which ingest sediments or otherwise retain radionuclides. Radiological analyses of these fish samples provide information on the potential ingestion of radionuclides by humans via the aquatic pathway. These samples are collected semiannually and analyzed by gamma spectroscopy.

The results of gamma isotopic analysis on the fish samples showed the presence of naturally occurring K-40 in all 1995 samples ranging from 2.16 to 3.26 pCi/g (wet). Preoperational K-40 concentrations ranged from 1.71 to 4.61 pCi/g (wet). All other analytical results were less than the lower limit of detection (LLD) for each radionuclide.

Shoreline Sediments

Samples of shoreline sediments are collected at six locations from Clinton Lake and at one location from Lake Shelbyville. Radiological analyses of shoreline sediments provide information on the potential shoreline exposure to humans and for determining long-term trends and accumulation of long-lived radionuclides in the environment. Samples are collected semiannually and analyzed for gross beta, gross alpha, Sr-90 and gamma isotopic activities.

Shoreline sediment samples are dried prior to analysis and the results are reported in pCi/g dry weight. Naturally occurring radioisotopes, such as K-40, Ra-226 and Pb-212, were present in samples taken at both indicator and control locations. Cesium-137, a fission product, was detected at an indicator location. The activity detected was not substantially different from that measured during the preoperational program.

The presence of these fission products is attributed to previous nuclear weapons testing and atmospheric fallout from the accident at Chernobyl.

	Preop Range (pCi/g dry)	1995 Range (pCi/g dry)	1994 Range (pCi/g dry)
Cs-137	0.016 - 0.045	0.021 - 0.046	0.016 - 0.047

Gross alpha activity in samples of shoreline sediments collected from all locations ranged from 1.56 to 7.40 pCi/g (dry) during 1995. This activity was attributed to naturally occurring radioisotopes and decay products present in soil. These values compare closely with the activity detected in the preoperational program which ranged from 3.8 to 8.0 pCi/g (dry).

Gross beta activity in samples of shoreline sediments collected from all locations ranged from 4.63 to 16.45 pCi/g (dry) during 1995. The majority of this activity was attributed to naturally occurring K-40. These values are comparable with the gross beta activity detected in the preoperational program which ranged from 7.0 to 17.2 pCi/g (dry).

Bottom Sediments

Samples of bottom sediments are collected from Clinton Lake at six locations and Lake Shelbyville at one location. Radiological analyses of bottom sediments primarily provide information about the amount of radionuclides available to predators who feed on the organisms found in bottom sediments. Samples are collected semiannually and analyzed for gross beta, gross alpha, Sr-90 and gamma isotopic activities.

Bottom sediment samples are dried prior to analysis and the results are reported in pCi/g dry weight. Naturally occurring radioisotopes, such as K-40 and Pb-212, were present in all 1995 control and indicator sample locations.

Cs-137 and Sr-90 was detected in samples from both indicator and control locations. Both radioisotopes are fission products.

	Preop Range (pCi/g dry)	1995 Range (pCi/g dry)	1994 Range (pCi/g dry)
Sr-90	0.011 - 0.056	0.010 - 0.025	0.011 - 0.021
Cs-137	0.008 - 1.39	0.008 - 0.41	0.017 - 0.38

The presence of these fission products is attributed to previous nuclear weapons testing and atmospheric fallout from the accident at Chernobyl.

Gross alpha activity in samples of bottom sediments collected from both lakes ranged from 4.56 to 15.94 pCi/g (dry) during 1995. This activity was attributed to naturally occurring radium isotopes and decay products present in soil. The preoperational gross alpha activity ranged from 4.4 to 14.7 pCi/g (dry).

Gross beta activity in samples of bottom sediments collected from both lakes ranged from 9.01 to 30.01 pCi/g (dry) during 1995. The majority of this activity was attributed to naturally occurring K-40. The preoperational gross beta activity ranged from 8.3 to 27.7 pCi/g (dry).

Aquatic Vegetation (Periphyton)

Samples of periphyton are collected from five locations in Clinton Lake and one location in Lake Shelbyville. Periphyton (attached algae) are collected from the submerged surface of the permanently anchored buoys or natural substrate. Periphyton absorb trace elements and radionuclides directly from water, often concentrating them to levels much higher than the dilute concentrations that occur in the aquatic environment. This is because most algae are coated with a carbohydrate jelly and have a large surface-to-volume ratio. Cell division usually occurs once every one or two days and, as a result, half of the cell wall is a new surface for sorption. Periphyton represent one of the earliest links in the food chain and provide information about the amounts of radionuclides available to predators further up the food chain.

Samples of periphyton are collected every two months between April and October (during the colder months growth is limited) at the indicator locations and semiannually at the control location and analyzed by gamma spectroscopy.

Periphyton analyses are included in the Clinton Power Station Environmental Monitoring Program because of their sensitivity to the presence of radionuclides in the aquatic environment due to bio-magnification.

Using periphyton as biomonitors for radionuclides in aquatic systems can be a highly sensitive and qualitatively effective means of environmental monitoring around nuclear power plants that release radioactive effluents to aquatic systems. It enables the Radiological Environmental Monitoring Program to determine the relative presence of radioactivity before it becomes a problem.

The results of the gamma isotopic analyses on periphyton samples showed the following concentrations of naturally occurring radioisotopes:

	Preop Range (pCi/g dry)	1995 Range (pCi/g dry)	1994 Range (pCi/g dry)
Be-7	0.38 - 1.07	0.39 - 2.27	0.10 - 1.42
K-40	0.74 - 6.82	0.60 - 5.46	0.25 - 4.76
Cs-137	0.042 - 0.15	0.025 - 0.088	0.026 - 0.085

One fission product, Cs-137, was detected in several periphyton samples. Concentrations for Cs-137 in 1995 ranged from 0.025 to 0.088 pCi/g (wet). Preoperational results for Cs-137 showed concentrations ranging from 0.042 to 0.15 pCi/g (wet). The presence of Cs-137 is attributed to previous nuclear weapons testing and atmospheric fallout from the accident at Chernobyl.

E. Terrestrial Monitoring

In addition to the direct radiation, radionuclides present in the atmosphere expose individuals when deposited on surfaces (e.g., plants and soil) and are subsequently ingested directly by man or indirectly by consumption of animal products (e.g., meat and milk). To monitor this food pathway, samples of green leafy vegetables, grass, milk and meat are analyzed.

Surface soil samples are collected and analyzed annually at the sewage sludge application site to ensure radionuclides attributed to the operation of Clinton Power Station are not being land applied with the processed sewage sludge. Every three years, samples are taken at nine other locations to monitor the potential buildup of atmospherically deposited radionuclides.

Surface vegetation samples are collected from a number of locations for the purpose of monitoring the potential buildup of atmospherically deposited radionuclides. Because the radionuclides of interest, with respect to the Clinton Power Station operations, are also present in the environment as a result of several decades of worldwide fallout or because they are naturally occurring, the presence of these radionuclides is expected in all of the samples collected.

The possible contributions of radionuclides from the operation of the Clinton Power Station are assessed by comparing the results of samples collected in prevalent downwind locations (north to north north-east of the plant) with control samples and samples collected in locations generally upwind of the plant. In addition, the results of samples collected during 1995 were compared with the results of samples collected during the preoperational program.

In addition to naturally occurring radioisotopes, Sr-90 was found in a number of 1995 samples. However, the concentrations of radionuclides in samples collected near the Clinton Power Station were comparable to the concentrations in samples collected at locations remote from the station. The presence of this fission product is attributable to previous nuclear weapons testing and fallout from the accident at Chernobyl. The operation of Clinton Power Station had no measurable contribution to the radioactive concentration of the terrestrial environment.

Milk

There is no known commercial production of milk for human consumption within a five-mile radius of the Clinton Power

Station. Milk samples are collected from a dairy located about 14 miles west southwest of the station and goat milk is collected from a family residence 3.5 miles south southwest of the station (twice a month during May through October and once a month during November through April). These samples are analyzed for I-131, Sr-90 and gamma isotopic activities.

The results of the analyses showed positive concentrations of K-40 and Sr-90 in all 1995 samples with a range of 1100 to 2160 pCi/l for K-40 and 0.9 to 2.4 pCi/l for Sr-90. Preoperational activity of K-40 in milk ranged from 706 to 1375 pCi/l. Strontium-90 analysis in milk was added to the REMP during the operational phase of the program, therefore there were no preoperational data for this isotope. I-131 was not detected in any milk sample obtained during 1995. Figure 10 presents the Sr-90 results graphically.

Grass

In addition to milk samples, grass samples are collected at three indicator locations and at two control locations. These samples are collected twice a month during May through October and once a month during November through April (when available). These samples are analyzed for gamma isotopic activity including I-131.

The results of the analyses showed only naturally occurring Be-7 and K-40 in all 1995 samples. Iodine-131 was not detected in any grass samples obtained during 1994.

	Preop Range (pCi/g wet)	1995 Range (pCi/g wet)	1994 Range (pCi/g wet)
Be-7	0.022 - 14.0	0.28 - 12.24	0.21 - 22.12
K-40	0.22 - 14.5	1.45 - 11.79	0.60 - 22.08

Vegetables

The Clinton Power Station obtains broadleaf vegetable samples from three indicator locations and at one control location. The indicator locations are located in the sectors with the highest potential for surface deposition and the control location is in a sector and at a distance which is considered to be unaffected by plant operations. Samples are collected once a month during the growing season (June through September) and analyzed for gross beta and gamma isotopic activities including I-131.

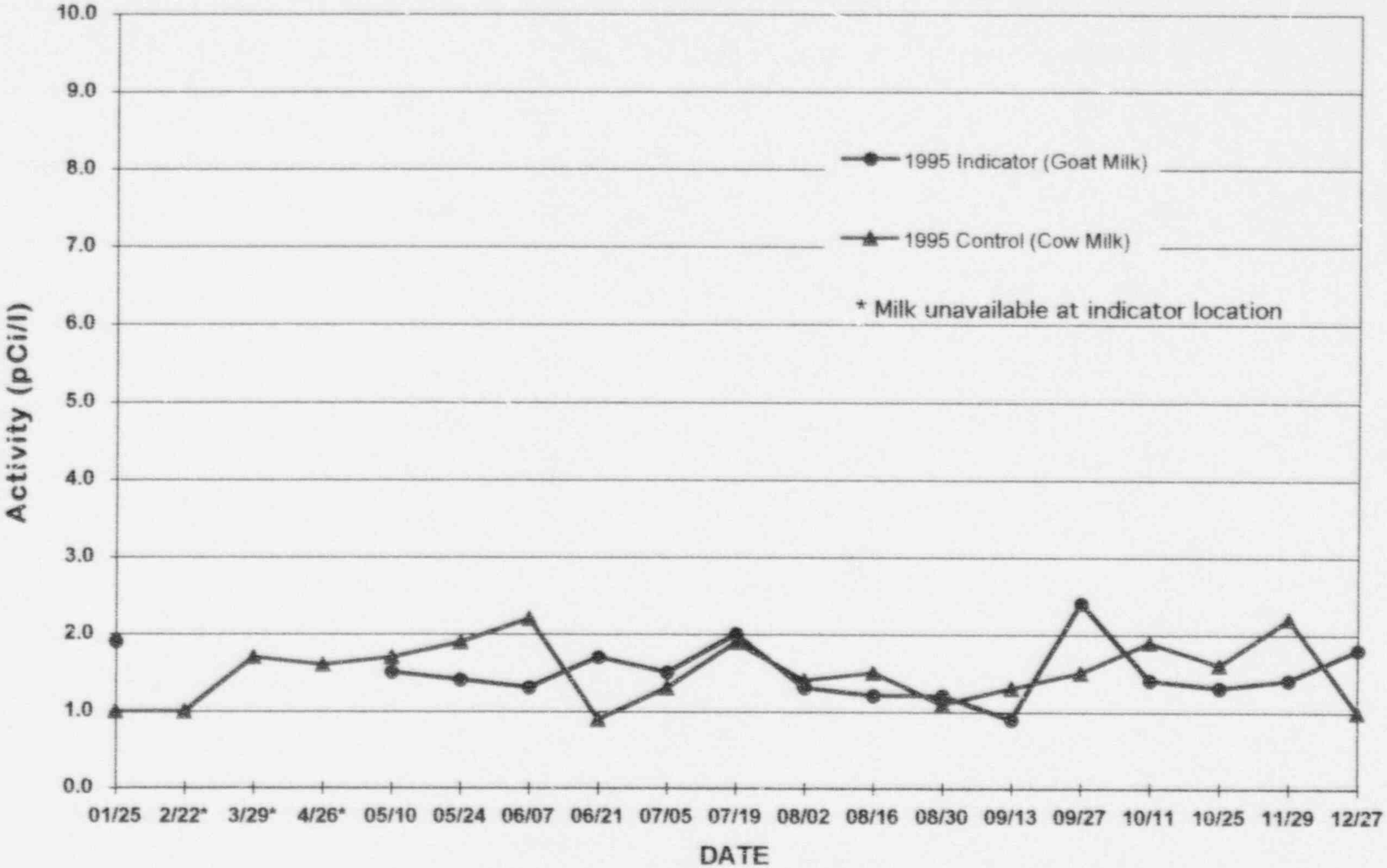


FIGURE 10: STRONTIUM-90 ACTIVITY IN MILK

The results of the gamma isotopic analysis showed only naturally occurring K-40 and Be-7.

	Preop Range (pCi/g wet)	1995 Range (pCi/g wet)	1994 Range (pCi/g wet)
Be-7	0.082 - 0.69	0.07 - 0.42	0.010 - 0.67
K-40	1.45 - 7.00	1.48 - 9.14	1.99 - 8.59
Gross Beta	0.87 - 8.80	2.15 - 10.13	1.86 - 14.74

Iodine-131 was not detected in any vegetable samples during 1995.

Meat

As an additional check on the presence of radioactive materials in terrestrial exposure pathways, annual samples of beef liver, beef thyroid and edible beef portions are collected from an animal raised near the Clinton Power Station. These samples are analyzed for gamma isotopic activity including I-131.

The results of the gamma isotopic analysis showed only naturally occurring K-40 in the liver and the edible beef portions at 2.36 and 2.53 pCi/g (wet) respectively. Preoperational activity ranged from 1.95 to 2.78 pCi/g (wet). I-131 was not detected in the meat samples during 1995.

Soil

One soil sample was collected from an area where Clinton Power Station land applies processed sewage sludge from the Clinton Power Station Sewage Treatment Plant.

Soil samples are sifted to remove any stones or debris, then dried and analyzed. All soil samples are analyzed for gross beta, gross alpha and gamma isotopic activities.

The results of the gross beta activity was 21.86 pCi/g (dry). Gross alpha activity was 1.03 pCi/g (dry). Gamma isotopic activity indicated several naturally occurring isotopes, such as K-40, Bi-214 and Pb-212.

	Preop Range (pCi/g dry)	1995 Results (pCi/g dry)	1994 Results (pCi/g dry)
Gross Beta	17.7 - 24.7	21.86	19.24 - 25.0
Gross Alpha	6.2 - 10.4	12.03	6.58 - 12.92

F. Water Monitoring

Water monitoring provides for the collection of drinking water, surface water and ground water (well water) samples to detect the presence of any radioisotopes related to the operation of the Clinton Power Station.

The only identified user of water from Clinton Lake for domestic purposes is the Clinton Power Station; all others potentially exposed to any radioisotopes released into surface or ground water would not be affected for several years.

Samples taken were analyzed for naturally occurring and man-made radioactive isotopes. Average gross beta concentrations in surface, drinking and well water are presented in Table 8 at the end of this section.

Drinking Water

A composite water sampler located in the Service Building collects a small, fixed volume sample at hourly intervals. The sampler discharges each sample into a common sample collection bottle. Therefore, the monthly sample analyzed by the contracted laboratory service is a composite of the individual samples collected throughout the month. The monthly composite sample is analyzed for gross alpha, gross beta and gamma isotopic activities. A portion of each monthly sample is mixed with the other monthly samples collected during each calendar quarter. The quarterly composite sample is analyzed for tritium.

Gross beta activity ranged from 1.2 to 2.3 pCi/l. These levels are attributed to very fine particles of sediment containing K-40 which are not removed during the chlorinating and filtration process. Monthly drinking water gross beta concentrations are presented in Figure 11.

One gross alpha analysis indicated 0.6 pCi/l. Preoperational result were all below the lower limits of detection except for one result which was 0.4 pCi/l. This result can be attributed to naturally occurring radioisotopes, such as U-238 and Ra-226, suspended as fine sediment particles in water.

The results of all analyses for tritium and gamma-emitting radioisotopes were all less than the lower limit of detection.

These results show no measurable effects on drinking water resulting from operation of the Clinton Power Station during 1995.

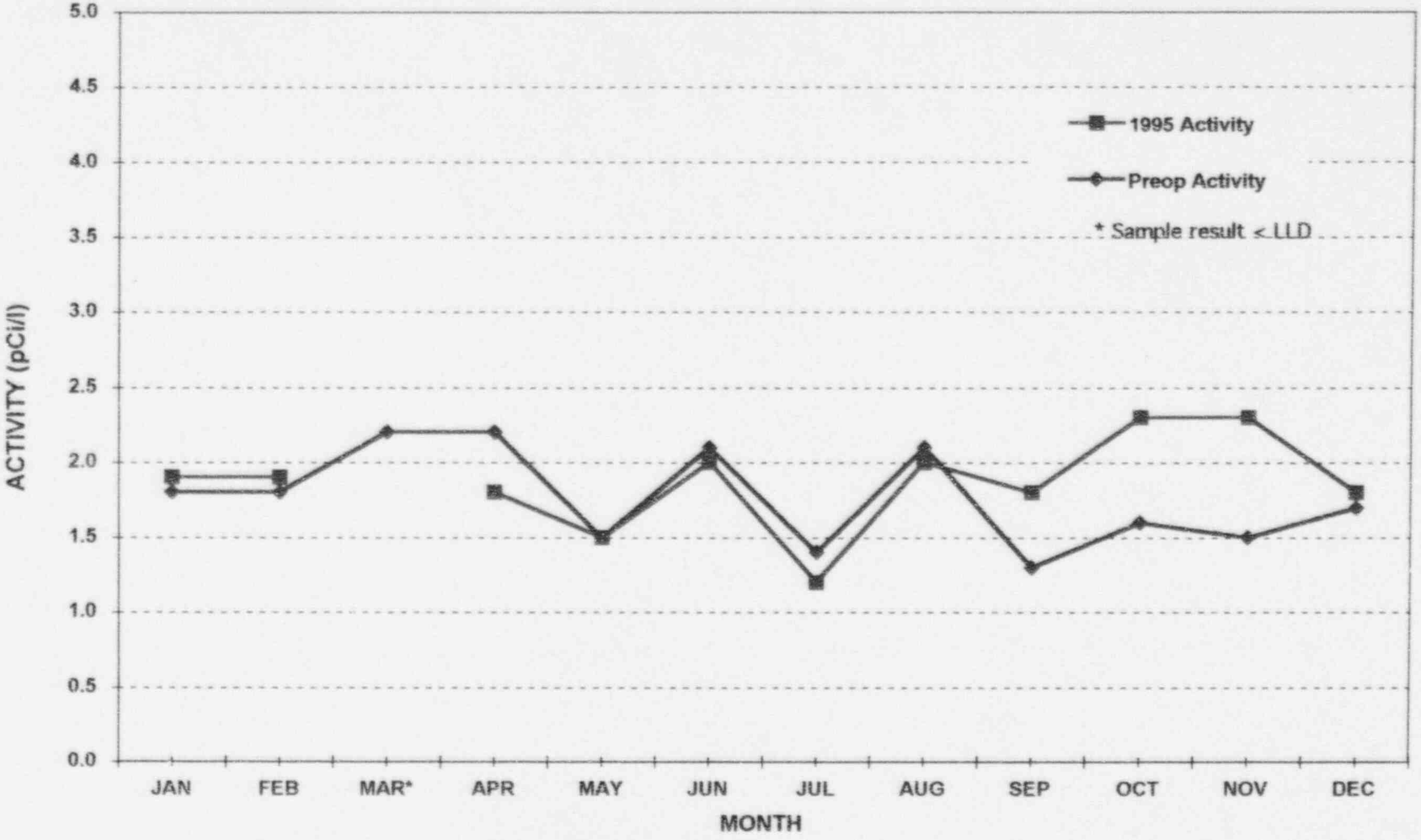


FIGURE 11: DRINKING WATER GROSS BETA COMPARISON

Surface Water

Composite water samplers are installed in four locations to sample surface water from Clinton Lake. These samplers collect a small volume of water at regular intervals and discharge it to a large sample collection bottle. These bottles are collected monthly.

Two of the composite samplers are located upstream from Clinton Power Station and are unaffected by plant liquid releases downstream. The two other composite samplers are positioned at the locations most likely to be affected by plant operations (one samples the intake water to the Circulating Water Intake Structure and the other samples the water at the start of the plant discharge flume).

Monthly grab samples are collected from two indicator locations and one control location on Clinton Lake. Surface water samples are analyzed for gross beta, gamma isotopic and tritium activities. Additional analyses for gross alpha activity are performed on the upstream water samples. Additional analyses for gross alpha activity and I-131 activity are performed on water samples taken from the discharge flume. Tritium analyses are performed monthly on samples from the intake structure water samples and the upstream composite water samples, and quarterly from composites of monthly samples at the other locations.

The 1995 results of the gross beta analyses ranged from 1.2 to 5.2 pCi/l at the indicator locations and 1.0 to 3.1 pCi/l at the control location. Preoperational gross beta activity ranged from 1.1 to 7.6 pCi/l. These results are attributed to naturally occurring K-40 suspended as fine sediment particles in water. Other types of samples have confirmed the presence of K-40 in Clinton Lake shoreline and bottom sediments. Monthly surface water gross beta activity for the control and indicator locations are presented graphically in Figure 12.

Tritium analyses performed on samples were all less than LLD. The preoperational tritium concentrations ranged from 220 to 330 pCi/l. As noted in reference (EI87), previous nuclear weapons testing increased the pre-1960 levels of tritium (6-24 pCi/l) by a factor of approximately fifty (300-1200).

Gamma-emitting radioisotopes were all below the lower limits of detection, and there was no iodine-131 detected in any surface water sample during 1995.

Gross alpha activity was detected in several of the surface water samples analyzed. These results ranged from 0.7 to 4.2 pCi/l. Preoperational gross alpha activity ranged from 1.3 to 1.9 pCi/l. These results were attributed to naturally occurring radioisotopes, such as U-238 and Ra-226, suspended as fine sediment particles in water.

These results show no measurable change in radioactive material concentration in surface water due to operation of the Clinton Power Station during 1995.

Well Water

Every two weeks samples are collected from the well serving the Village of DeWitt (both treated and untreated samples are obtained) and from a well serving the Illinois Department of Conservation at the Mascoutin State Recreational Area. Each sample is analyzed for I-131. All samples drawn from the same well during a particular month are combined and analyzed for gross alpha, gross beta and gamma isotopic activities. In addition, a portion of each monthly composite is added to the quarterly composite sample and is analyzed for tritium.

The 1995 results of the gross beta analyses ranged from 1.2 to 4.7 pCi/l. Preoperational gross beta activity ranged from 1.1 to 5.1 pCi/l. The gross beta activity was attributed to naturally occurring K-40 suspended as fine sediment particles in water

Gross alpha activities in well water samples ranged from 1.3 to 2.3 pCi/l. Preoperational gross alpha activity ranged from 0.9 to 1.8 pCi/l. Gross alpha activity can be attributed to naturally occurring radioisotopes, such as, U-238 and Ra-226, suspended as fine sediment particles in water.

Gamma-emitting radioisotopes were all below the lower limits of detection. Tritium and I-131 were not detected in any well water samples taken during 1995.

These results show no measurable change in radioactive material concentration in well water resulting from operation of the Clinton Power Station during 1995.

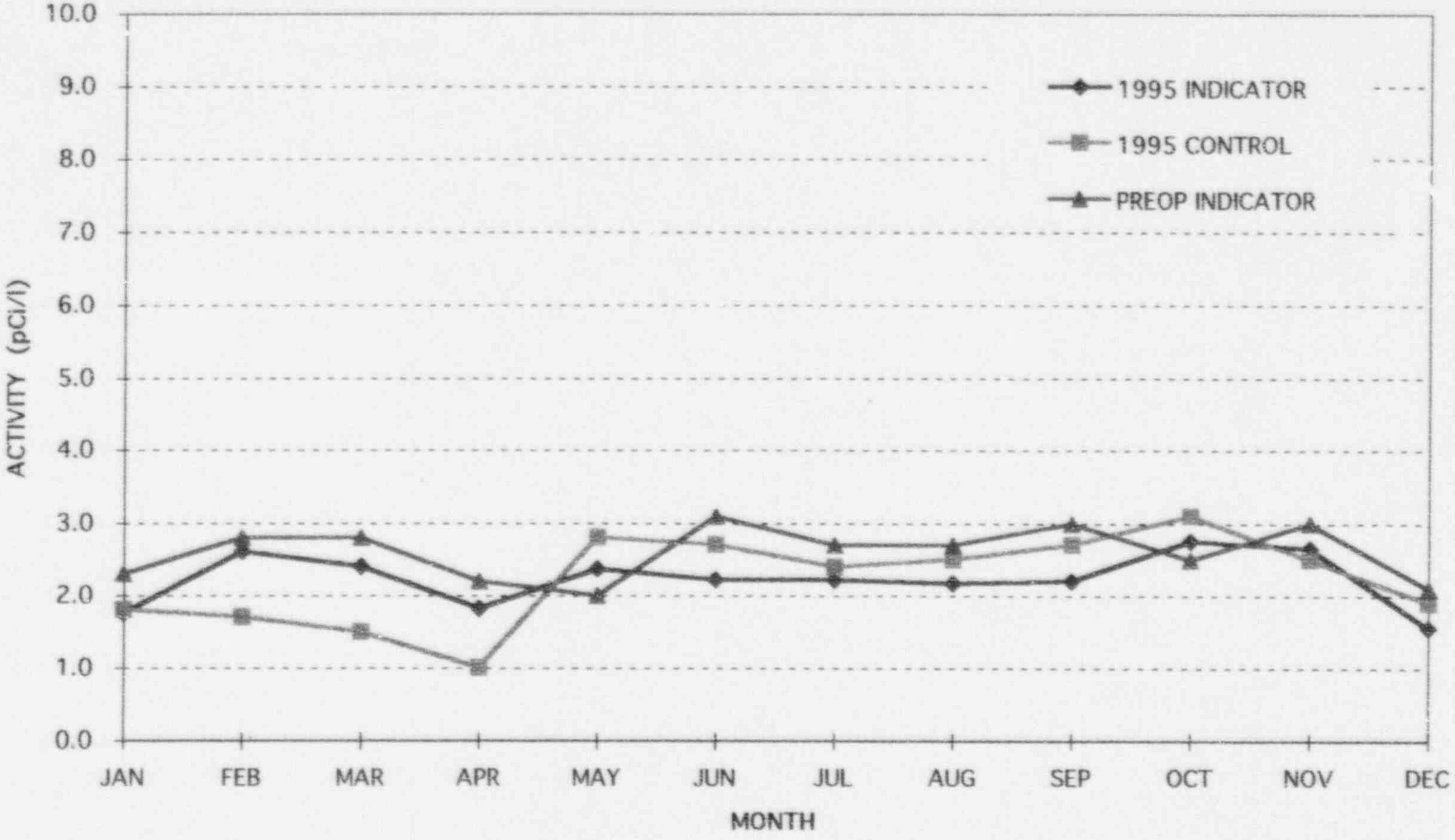


FIGURE 12: SURFACE WATER GROSS BETA ACTIVITY COMPARISON

TABLE 8

AVERAGE GROSS BETA CONCENTRATIONS IN DRINKING, SURFACE AND WELL WATER

Station	Description	1994 Average ±2σ (pCi/l)	1995 Average ±2σ (pCi/l)
	Drinking Water		
CL-14	CPS (Service Building)	2.0 ± 0.5	1.9 ± 0.6
	Surface Water		
CL-9	DeWitt Road Bridge	2.9 ± 1.9	2.3 ± 1.2
CL-10(c)	IL 48 Bridge	2.7 ± 1.5	2.2 ± 1.3
CL-13	Salt Creek (below dam)	2.8 ± 0.9	2.2 ± 1.2
CL-90	CPS Discharge Flume	2.6 ± 0.7	2.8 ± 2.8
CL-91	Parnell Boat Access	2.1 ± 1.0	2.5 ± 1.2
CL-92	CPS Intake Screenhouse	2.7 ± 1.3	2.3 ± 1.0
CL-99	North Fork Canoe Access	3.1 ± 4.2	2.5 ± 1.5
	Well Water		
CL-7D	Mascoutin State Recreation Area	1.4 ± 0.6	1.4 ± 0.3
CL-12(T)	DeWitt Pump Station	2.2 ± 1.0	2.9 ± 2.0
CL-12(U)	DeWitt Pump Station	1.9 ± 1.3	3.3 ± 2.4

(U) Untreated (T) Treated
(c) Control location; all others are indicators

G. Quality Assurance Program

To establish confidence that data developed and reported are accurate and precise, all REMP activities are incorporated into the Illinois Power Company Quality Assurance (QA) program of audits and surveillances. The Quality Assurance program requires:

- Participation in intercomparison programs, such as the EPA cross-check program.
- An annual audit of the analysis laboratory functions and facilities.
- Periodic review of the Clinton Power Station procedures specifying sampling techniques.
- Duplicate analysis of every tenth sample assayed (not including TLDs). This requirement is to check laboratory precision.
- The routine counting of quality control samples. Approximately ten percent of the total number of counts performed are to be quality control counts.

The analytical results provided by the laboratory were routinely reviewed by the Radiological Environmental Group of the Radiation Protection Department to ensure the required minimum sensitivities have been achieved and the proper analyses have been performed.

Teledyne Brown Engineering Environmental Services Midwest Laboratory (TBEESML) participates in the Environmental Protection Agency cross-check program. The TBEESML participant code in the cross-check program is CA. Participation in this program provides assurance that the laboratory is capable of meeting widely-accepted criteria for radioactivity analysis.

Results of the 1995 cross-check program are shown in Appendix D.

H. Changes to the REMP During 1995

Occasionally changes to the Radiological Environmental Monitoring Program are necessary to improve the monitoring of the environmental exposure pathways. These changes may result from items identified during the performance of the Annual Land Use Census, revised or new regulatory requirements, Quality Assurance audits or supplemental periodic and long-term sampling and analyses.

During 1995, CL-92 and CL-93 were deleted from the program. Also, an additional type of broadleaf vegetation (collard greens) was grown to supplement the current types of vegetation grown (cabbage, lettuce, Swiss chard, kale greens and spinach).

ANNUAL LAND USE CENSUS

IV. ANNUAL LAND USE CENSUS

A land use census is performed to ensure that changes in the use of areas at and beyond the site boundary are identified and that any necessary modifications to the REMP are made.

The land use census is performed to identify within a distance of 5 miles (8 km), the locations in each of the 16 meteorological sectors of the nearest milk animals, the nearest residence and the nearest garden of greater than 500 square feet producing broadleaf vegetation. Also, the census shall identify within a distance of 3 miles (5 km), the location in each of the 16 meteorological sectors of all milk animals and all gardens of greater than 500 square feet producing broadleaf vegetation.

TABLE 9
1995 ANNUAL LAND USE CENSUS

Sector	Nearest Residence (km)	Nearest Garden (km)	Nearest Milk Animal (km)
N	1.68	1.68	1.68
NNE	1.71	1.71	2.14
NE	2.07	3.46	3.46
ENE	2.78	4.21	7.54
E	1.42	3.95	[a]
ESE	5.14	5.14	[a]
SE	4.73	4.73	[a]
SSE	2.74	3.96	3.72
S	4.78	4.78	[a]
SSW	4.68	4.68	5.36
SW	1.13	5.87	5.87
WSW	2.47	4.45	5.53
W	2.63	2.63	3.35
WNW	2.66	0.80	[a]
NW	2.79	3.11	[a]
NNW	2.85	2.85	1.74

[a] None identified within 8 kilometers of CPS in this meteorological sector.

The 1995 Land Use Census was conducted during the growing season satisfying the CPS Offsite Dose Calculation Manual requirements. Over 170 residences were surveyed by either direct contact, mailed in questionnaire, telephone, or direct observation. Data for this report was obtained using the following means:

- Performed door-to-door solicitation of residences/land owners identified in the 1994 Annual Land Use Census and the 1994 DeWitt County plat book. If a resident was unavailable for questioning, a questionnaire was placed on their door to have them fill out and mail back.

° Performed telephone solicitation of persons who were unavailable during the door-to-door survey and didn't mail back their questionnaire.

° By direct observation of land when the aforementioned methods were unsuccessful. If an individual was unable to be contacted, data from the previous year was used.

° Contacted several state and local agencies.

The 1995 Land Use Census results were examined to ensure that the REMP will provide representative measurements of radiation and radioactive materials in those exposure pathways and for those radionuclides that lead to the highest potential radiation exposures to the general public resulting from Clinton Power Station operations.

On the basis of the examination of the 1995 Annual Land Use Census results, no changes to the REMP were made.

Summary of Changes Identified in 1995 Annual Land Use Census

Nearest Residence

Three changes were identified for the nearest residence. These changes are shown below:

1995 Census Location	1994 Census Location
2.07 km NE	3.07 km NE
1.42 km E	1.58 km E
2.85 km NNW	2.50 km NNW

Nearest Garden

A total of 100 gardens were identified in the 16 sectors within a 5-mile (8 km) radius of Clinton Power Station of which 60 produced broad leaf vegetation (e.g., lettuce and cabbage) and were greater than 50 m^2. In most cases, tomatoes, sweet corn and beans were grown in gardens identified.

Changes in census locations for the nearest garden were identified in 7 of the 16 sectors and are shown below:

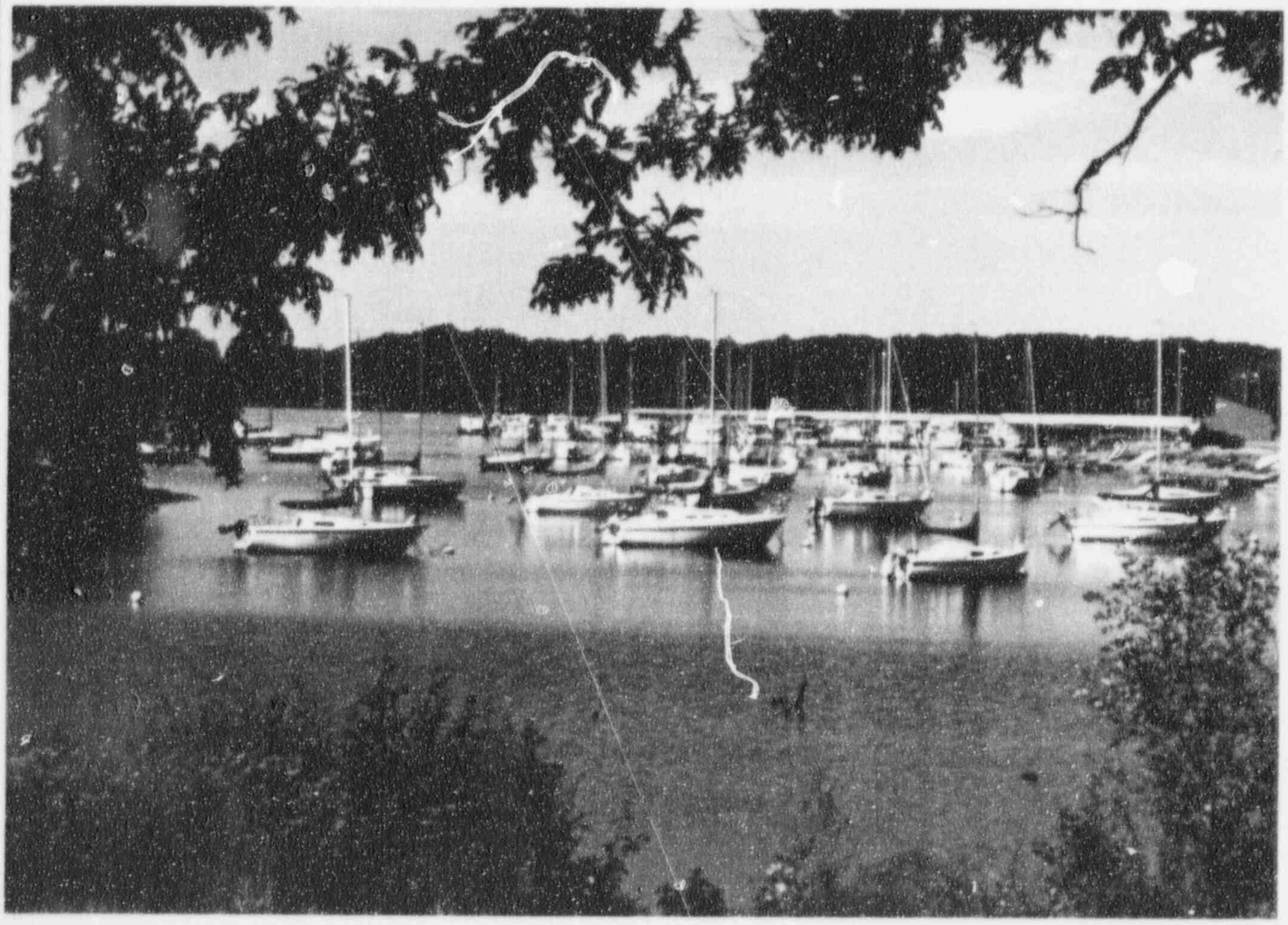
1995 Census Location	1994 Census Location
1.71 km NNE	3.76 km NNE
3.46 km NE	5.56 km NE
4.21 km ENE	2.78 km ENE
3.96 km SSE	4.19 km SSE
5.87 km SW	6.73 km SW
4.45 km WSW	4.32 km WSW
2.85 km NNW	3.76 km NNW

Nearest Livestock/Dairy

Milking animals within 5 miles (8 km) were located in the 16 sectors surrounding CPS. The cattle were used for nursing of calves and meat production (both own use and meat production). Goats were found at one location that used the milk for human consumption.

Changes in the census locations for the nearest livestock/dairy were identified in 2 of the 16 sectors and are shown below:

1995 Census Location	1994 Census Location
3.46 km NE	5.63 km NE
>8 km S	6.49 km S



LIST OF REFERENCES

V. LIST OF REFERENCES

ANSI75 American National Standards Institute, Inc., "Performance, Testing and Procedural Specifications for Thermoluminescent Dosimetry," ANSI N545-1975.

ASTM75 American Society for Testing and Materials, "Standard Recommended Practice for Dealing with Outlying Observations," ASTM E178-75.

CFR Code of Federal Regulations, Title 10, Part 20 (Nuclear Regulatory Commission).

CL95 CPS 1995 Radioactive Effluent Release Report.

EI87 "Environmental Radioactivity," M. Eisenbud, 1987.

EPA72 "Natural Radon Exposure in the United States," Donald T. Oakley, U.S. Environmental Protection Agency. ORP/SID 72-1, June 1972.

FRC60 Federal Radiation Council Report No. 1, "Background Material for the Development of Radiation Protection Standards," May 13, 1960.

ICRP77 International Commission on Radiological Protection, Publication 2, "Report of Committee II on Permissible Dose for Internal Radiation," (1959) with 1962 Supplement issued in ICRP Publication 6; Publication 9, "Recommendations on Radiation Exposure," (1965); ICRP Publication 7 (1965), amplifying specific recommendations of Publication 26 (1977).

ICRP84 International Commission on Radiation Protection, Publication No. 39 (1984), "Principles of Limiting Exposure to the Public to Natural Sources of Radiation."

KA84 "Radioactivity in the Environment: Sources, Distribution and Surveillance," Ronald L. Kathren, 1984.

NCRP59 National Council on Radiation Protection and Measurements, Report No. 22, "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and Water for Occupational Exposure," (Published as National Bureau of Standards Handbook 69, issued June 1959, superseding Handbook 52).

NCRP71 National Council on Radiation Protection and Measurements, Report No. 39, "Basic Radiation Protection Criteria," January 1971.

NCRP75 National Council on Radiation Protection and Measurements, Report No. 44, "Krypton-85 in the Atmosphere - Accumulation, Biological Significance, and Control Technology," July 1975.

NCRP87a National Council on Radiation Protection and Measurements, Report No. 91, "Recommendations on Limits for Exposure to Ionizing Radiation," June 1987.

NCRP87b National Council on Radiation Protection and Measurements, Report No. 93, "Ionizing Radiation Exposure of the Population of the United States," September 1987.

NR90 National Research Council, 1990, Committee on Biological Effects of Ionizing Radiation (BEIR V), Board on Radiation Effects Research on Life Sciences, "The Effects of Exposure to Low Levels of Ionizing Radiation".

NRC74 United States Nuclear Regulatory Commission, Regulatory Guide 5.36, "Recommended Practice for Dealing with Outlying Observations," June 1974.

NRC75 United States Nuclear Regulatory Commission, Regulatory Guide 4.1, "Programs for Monitoring Radioactivity in the Environs of Nuclear Power Plants," Revision 1, April 1975.

NRC77a United States Nuclear Regulatory Commission, Regulatory Guide 4.13, "Performance, Testing and Procedural Specifications for Thermoluminescence Dosimetry: Environmental Applications," Revision 1, July 1977.

NRC77b United States Nuclear Regulatory Commission, Regulatory Guide 1.109, "Calculation of Annual Dose to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10CFR Part 50, Appendix I," Revision 1, October 1977.

NRC79a United States Nuclear Regulatory Commission Branch Technical Position, "An Acceptable Radiological Environmental Monitoring Program," Revision 1, November 1979.

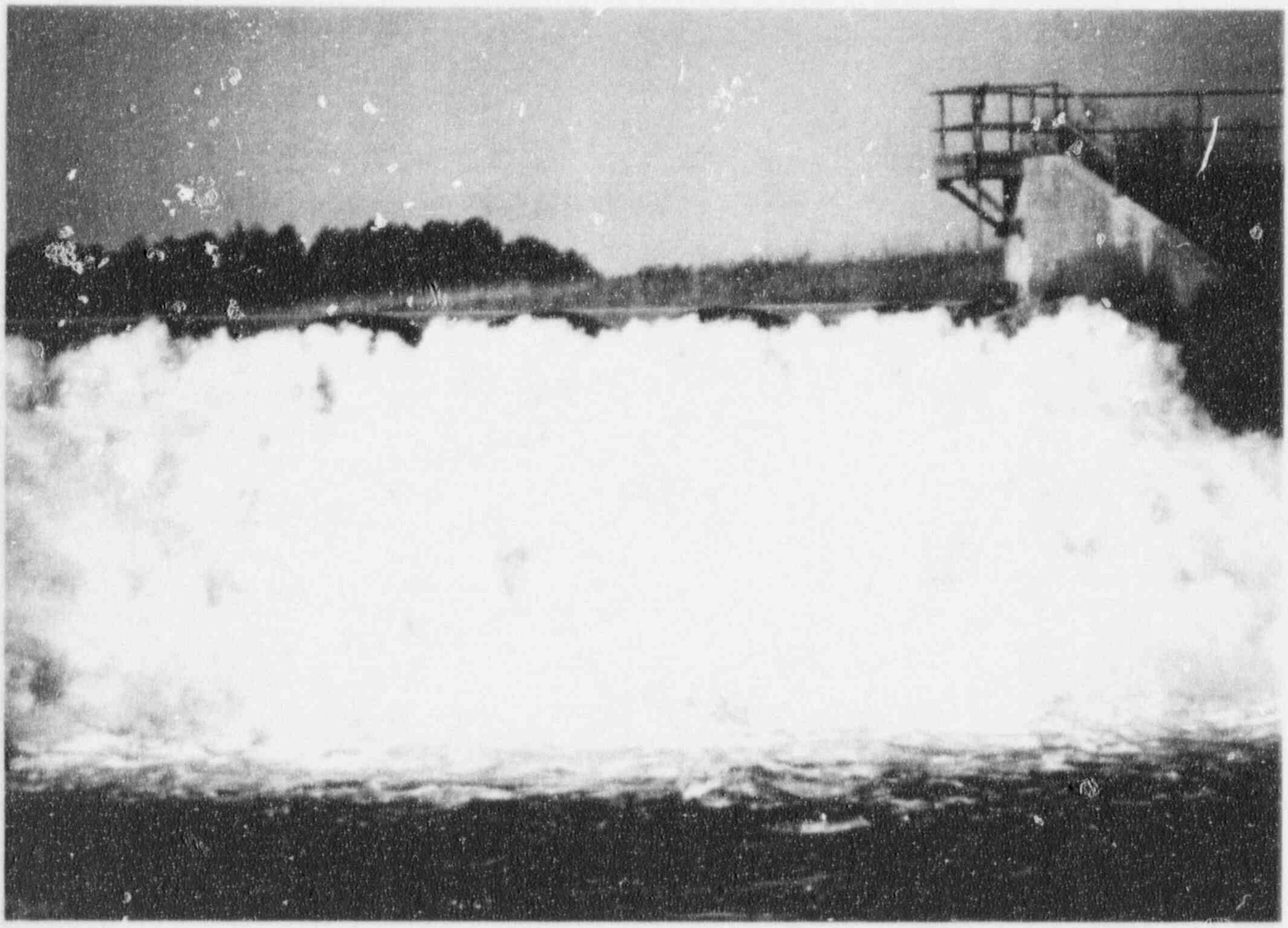
NRC79b United States Nuclear Regulatory Commission , Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs (Norm Operations) - Effluent Streams and the Environment," Revision 1, February 1979.

NUREG86 Technical Specification, Clinton Power Station, Unit No. 1, Docket No. 50-461, Office of Nuclear Reactor Regulation, 1986.

PERI88 "The Use of Diatoms (Periphyton) in Monitoring Light Water Reactor Radioactive Liquid Effluence in the Susquehanna River," Ruth Patrick and John M. Palms, 1988.

TEPM Analytical Procedures Manual, Teledyne Brown Engineering Environmental Services Midwest Laboratory (Northbrook, Illinois).

USAR Illinois Power, Clinton Power Station, Updated Safety Analysis Report.



APPENDICES

APPENDICES

APPENDIX A

Exceptions to the REMP During 1995

Exceptions to the REMP During 1995

Data from the radiological analysis of environmental samples are routinely reviewed and evaluated by the Clinton Power Station Radiological Environmental Group. This data is checked for LLD compliance, anomalous values, quality control sample agreement, and any positive results which are inconsistent with expected results or which exceed any Offsite Dose Calculation Manual reporting levels. Reporting levels for radioactivity concentrations in environmental samples required by the Clinton Power Station Offsite Dose Calculation Manual are listed in Table A-1.

If an inconsistent result occurs, an investigation is initiated which may consist of some of the following actions:

- Examine the collection data sheets for any indication of collection or delivery errors, tampering, vandalism and equipment calibration or malfunctions due to electrical power failure, weather conditions, etc.
- Perform statistical tests
- Examine previous data for trends
- Review other results from same sample media and different sample media
- Review control station data
- Review quality control or duplicate sample data
- Review CPS effluent reports
- Recount and/or reanalyze the sample
- Collect additional samples as necessary

During 1995, no investigations were performed as a result of reaching any Offsite Dose Calculation Manual (ODCM) reporting levels. All sample analysis required by the ODCM achieved the LLDs specified by ODCM Table 5.1-3. Sampling and analysis exceptions are listed in Table A-2 of this appendix.

TABLE A-1

CPS REMP REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES[d]

Analysis	Water (pCi/l)	Airborne Particulate or Gases (pCi/m^3)	Fish (pCi/kg, wet)	Milk (pCi/l)	Food Products (pCi/kg, wet)
H-3	20,000[a]		—	---	—
Mn-54	1,000	—	30,000	—	—
Fe-59	400	—	10,000	—	—
Co-58	1,000	—	30,000	—	—
Co-60	300	—	10,000	—	—
Zn-65	300	—	20,000	—	—
Zr/Nb-95	400[c]	---	—	—	—
I-131	2[b]	0.9	—	3	100
Cs-134	30	10	1,000	60	1,000
Cs-137	50	20	2,000	70	2,000
Ba/La-140	200[c]	---	—	300	—

a For drinking water samples. This is the 40 CFR Part 141 value. If no drinking water pathway exists, a value of 30,000 pCi/l may be used.

b If no drinking water pathway exists, a value of 20 pCi/l may be used.

c Total for parent and daughter.

d This list does not mean these nuclides are the only ones considered. Other nuclides are identified and reported when applicable.

TABLE A-2

SAMPLING AND ANALYSIS EXCEPTIONS FOR 1995

1. **January 4**

   CL-6 air sampler elapsed timer malfunctioned. Actual time was used for sample volume calculation. An operability check was performed the next day and the timer was working satisfactorily.

   CL-7 air sampler found with the pump not running due to a blown fuse. The fuse was replaced. Elapsed timer indicated 166.3 hours of operation. The sample was analyzed and determined to be reliable and considered valid.

2. **January 18**

   CL-6 air sampler elapsed timer malfunctioned. Actual time was used for sample volume determination and timer was replaced.

3. **January 25**

   CL-4 air sampler elapsed timer malfunctioned. Actual time was used for sample volume determination.

4. **February 1**

   Air sampler elapsed timers off at CL-15 and CL-94 by 2.7 and 5.6 hours respectively due to a power outage caused by an ice storm during the sample period. The elapsed timers were used for sample volume calculations.

5. **February 15**

   Air sampler pump at CL-94 found not working. Light filter loading indicative of little run-time. Discarded the sample and replaced the air sample pump.

6. **February 22**

   CL-94 air sampler found with filter head disconnected. Discarded the sample and replaced the quick disconnect fitting.

   Air sampler timer off at CL-6 by 8.2 hours due to a loss of power while maintenance was being performed on the 12 KV loop. The elapsed timer was used for the sample volume calculation.

Milk unavailable at CL-98 due to goats "drying up" during the winter months.

7. **March 1**

Air sampler timer off at CL-6 by 32.9 hours due to a loss of power while maintenance was being performed on the 12 KV loop. The elapsed timer was used for the sample volume calculation.

8. **March 8**

Air sampler elapsed timers off at CL-94 and CL-3 by 3.0 and 2.8 hours each. The reason is due to loss of power while maintenance was performed on the power lines by the electric utility. The elapsed timers were used for the sample volume calculations.

Air sampler timer off at CL-6 by 49.8 hours due to a defective timer. Actual time was used for sample volume calculation and timer was replaced.

9. **March 15**

Air sampler elapsed timer off at CL-6 by 2.5 hours due to a power outage caused by thunderstorms during the sample period. The elapsed timer was used for sample volume calculation.

10. **March 29**

CL-4 air sample elapsed timer was found not working. A new timer was installed. Actual time used for sample volume calculation.

Milk unavailable at CL-98 due to goats "drying up" during the winter months.

11. **April 26**

Air sampler elapsed timers off at CL-4 and CL-6 by 11.0 hours due to a power outage caused by thunderstorms during the sample period. The elapsed timers were used for sample volume calculations.

Milk unavailable at CL-98 due to goats "drying up" during the winter months.

12. **May 17**

Air sampler elapsed timer off at CL-1, CL-4 and CL-6 by 5.0, 2.9 and 2.9 hours due to a power outage caused by thunderstorms during the sample period. The elapsed timers were used for sample volume calculations.

13. **May 31**

Air sampler elapsed timers off at CL-94 and CL-15 by 6.3 and 6.6 hours due to a power outage caused by thunderstorms during the sample period. The elapsed timers were used for sample volume calculations.

14. **June 21**

Air sampler elapsed timer off at CL-8 by 4.0 hours due to a power outage caused by thunderstorms during the sample period. The elapsed timer was used for sample volume calculation.

15. **June 28**

Air sampler elapsed timer off at CL-15 by 1.5 hours due to a power outage caused by thunderstorms during the sample period. The elapsed timer was used for sample volume calculation.

Unable to obtain vegetation samples at CL-115 due to inadequate plant growth. Slowed plant growth was attributed to herbicide carryover from an adjacent cornfield.

16. **July 12**

Air sampler at CL-6 found with elapsed timer off by 3.9 hours. The reason for this was unknown. The elapsed timer was used for sample volume calculation.

17. **July 19**

Air sampler at CL-6 found de-energized with 66.0 hours of operation. Cause (tampering) determined to be related to power being shut off manually at the electrical safety switch. The sample was considered invalid and discarded due to having an inadequate volume collected.

18. **August 9**

Air sampler elapsed timers off at CL-4 and CL-6 by 4.2 and 4.3 hours due to a power outage caused by thunderstorms during the sample period. The elapsed timers were used for sample volume calculations.

19. **August 16**

Air sampler elapsed timers off at CL-1 by 3.2 hours, and CL-4 and CL-6 by 0.8 hours due to a power outage caused by thunderstorms during the sample period. The elapsed timers were used for sample volume calculations.

20. **August 23**

CL-15 air sampler elapsed timer was found not working. Actual time was used for sample volume calculation and a new timer was installed.

Air sampler at CL-8 found recently seized. Replaced air sample pump. As left values used for sample volume calculation. Analysis result was consistent with other stations' air sample results and considered valid.

21. **September 13**

CL-15 air sampler elapsed timer was found not working. Replaced air sample pump. Due to light filter loading, filter media was discarded.

22. **September 27**

CL-2 was found with the particulate filter paper damaged causing it to be effectively by-passed. The analysis of the data indicated the sample to be unreliable and inconsistent with other air sample results for the sampling period.

23. **October 18**

Air sampler elapsed timer off at CL-8 by 13.4 hours due to a power outage for maintenance in the area. The elapsed timer was used for sample volume calculation.

Air sampler at CL-2 found with elapsed timer off by 0.7 hours. The reason for this was unknown. The elapsed timer was used for sample volume calculation.

24. **October 25**

Air sampler at CL-6 found running with an elapsed timer value of 50 hours. The reason for this is a power outage due to maintenance on the 12 KV bus. The sample was considered invalid and discarded due to having an inadequate volume collected.

25. **November 1**

Air sampler at CL-94 found with elapsed timer off by 2.0 hours. The reason for this was unknown. The elapsed timer was used for sample volume calculation.

26. **November 8**

Review of air sample analysis results for CL-6 not consistent with other air sample stations. Analysis Lab contacted and the filter was found to be damaged causing it to be effectively by-passed. The analysis of the data indicated the sample to be unreliable and inconsistent with other air sample results for the sampling period.

27. **November 15**

Air sample pump at CL-6 found not running with 88 hours on the elapsed timer. Replaced air sample pump. The sample was considered invalid and discarded due to having an inadequate volume collected.

28. **November 29**

Air sample pump at CL-1 found seized. The analysis of the data indicated the sample to be unreliable and inconsistent with other air sample results for the sampling period.

29. **December 6**

Air sample pump at CL-2 found seized. The analysis of the data indicated the sample to be unreliable and inconsistent with other air sample results for the sampling period.

30. Air sample pump at CL-6 found with a very low flowrate. The exact cause was unknown. The analysis of the data indicated the sample to be unreliable and inconsistent with other air sample results for the sampling period.

31. **December 27**

No grass samples collected due to snow cover

APPENDIX B

REMP Sample Collection and Analysis Methods

TABLE B-1

CLINTON POWER STATION

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SUMMARY OF SAMPLE COLLECTION AND ANALYSIS METHODS

Analysis	Sample Medium	Sampling Method	Approximate Sample Size Collected	Teledyne Procedure Number	Procedure Abstract
Gross Beta	AP	Continuous air sampling through filter media	$280m^3$	TIML-AP-02	Sample counted in a low level gas flow proportional counter
	WW	Grab	7.6 ℓ	TIML-W(DS)-01	Sample evaporated on a stainless steel planchette for low-level gas flow proportional counting
	SW	Grab	3.8 ℓ	TIML-W(DS)-01	Sample evaporated on a stainless steel planchette for low-level gas flow proportional counting
	SW	Composite	3.8 ℓ	TIML-W(DS)-01	Sample evaporated on a stainless steel planchette for low-level gas flow proportional counting
	VE	Grab	2.5kg	TIML-AB-01	Sample ashed for low-level gas flow proportional counting
	BS	Grab	1.5-2.0kg	TIML-AB-01	Sample pulverized and dried for low-level gas flow proportional counting
	SS	Grab	1.5-2.0kg	TIML-AB-01	Sample pulverized and dried for low-level gas flow proportional counting
	DW	Composite	3.8 ℓ	TIML-W(DS)-01	Sample evaporated on a stainless steel planchette for low-level gas flow proportional counting
	SO	Grab	1.0kg	TIML-AB-01	Sample pulverized and dried for low-level gas flow proportional counting

TABLE B-1 (Cont'd)

Analysis	Sample Medium	Sampling Method	Approximate Sample Size Collected	Teledyne Procedure Number	Procedure Abstract
Gamma Spectroscopy	AP	Composite	$3640m^3$	TIML-GS-01	Germanium gamma isotopic analysis
	G	Grab	1.0kg	TIML-GS-01	Germanium gamma isotopic analysis
	WW	Grab	7.6 ℓ	TIML-GS-01	Germanium gamma isotopic analysis
	SW	Composite	3.8 ℓ	TIML-GS-01	Germanium gamma isotopic analysis
	VE	Grab	2.5kg	TIML-GS-01	Germanium gamma isotopic analysis
	BS	Grab	1.5 - 2.0kg	TIML-GS-01	Germanium gamma isotopic analysis
	SS	Grab	1.5 - 2.0kg	TIML-GS-01	Germanium gamma isotopic analysis
	SL	Grab	0.3 - 6.0kg	TIML-GS-01	Germanium gamma isotopic analysis
	F	Grab	2.5kg	TIML-GS-01	Germanium gamma isotopic analysis
	ME	Grab	3.0kg	TIML-GS-01	Germanium gamma isotopic analysis
	DW	Composite	3.8 ℓ	TIML-GS-01	Germanium gamma isotopic analysis
	SW	Grab	3.8 ℓ	TIML-GS-01	Germanium gamma isotopic analysis
	SO	Grab	1.0kg	TIML-GS-01	Germanium gamma isotopic analysis
	M	Grab	3.8 ℓ	TIML-GS-01	Germanium gamma isotopic analysis
Direct Radiation	TLD	Continuous Exposure	NA	TIML-TLD-01	Integration of thermally stimulated visible photons

TABLE B-1 (Cont'd)

Analysis	Sample Medium	Sampling Method	Approximate Sample Size Collected	Teledyne Procedure Number	Procedure Abstract
Gross Alpha (cont'd)	SW	Composite	3.8 ℓ	TIML-W(DS)-01	Sample evaporated on a stainless steel planchette for low-level gas flow proportional counting
	WW	Grab	7.6 ℓ	TIML-W(DS)-01	Sample evaporated on a stainless steel planchette for low-level gas flow proportional counting
	BS	Grab	1.5 - 2.0kg	TIML-AB-01	Sample pulverized and dried for low-level gas flow proportional counting
	DW	Composite	3.8 ℓ	TIML-W(DS)-01	Sample evaporated on stainless steel planchette for low-level gas flow proportional counting
	SO	Grab	1.0kg	TIML-AB-01	Sample pulverized and dried for low-level gas flow proportional counting
	SS	Grab	1.5 - 2.0kg	TIML-AB-01	Sample pulverized and dried for low-level gas flow proportional counting
Sr-90	BS	Grab	1.5 - 2.0kg	TIML-SR-06	Hydrochloric acid leach and low-level gas flow proportional counting
	SS	Grab	1.5 - 2.0kg	TIML-SR-06	Hydrochloric acid leach and low-level gas flow proportional counting
	M	Grab	3.8 ℓ	TIML-SR-07	Sample chemically separated and dried for low-level gas flow proportional counting
Tritium	SW	Composite	3.8 ℓ	TIML-T-02	Distillation followed by counting in a liquid scintillation counter
	DW	Composite	3.8 ℓ	TIML-T-02	Distillation followed by counting in a liquid scintillation counter

TABLE B-1 (Cont'd)

Analysis	Sample Medium	Sampling Method	Approximate Sample Size Collected	Teledyne Procedure Number	Procedure Abstract
Tritium (cont'd)	SW	Grab	11.4 ℓ	TIML-T-02	Distillation followed by counting in a liquid scintillation counter
	WW	Grab	22.8 ℓ	TIML-T-02	Distillation followed by counting in a liquid scintillation counter
	SW	Grab	3.8 ℓ	TIML-T-02	Distillation followed by counting in a liquid scintillation counter
I-131	ME	Grab	1.4kg	TIML-GS-01	Germanium gamma isotopic analysis
	AI	Continuous air sampling through filter media	280m^3	TIML-I-131-02	Germanium gamma isotopic analysis
	SW	Grab	3.8 ℓ	TIML-I-131-03	Ion exchange and proportional beta counting
	WW	Grab	7.6 ℓ	TIML-I-131-03	Ion exchange and proportional beta counting
	G	Grab	1.0kg	TIML-GS-01	Germanium gamma isotopic analysis
	M	Grab	3.8 ℓ	TIML-I-131-01	Ion exchange and proportional beta counting

TABLE B-2

1995 REMP SAMPLING AND ANALYSIS FREQUENCY SUMMARY

Sample Type	Number of Sampling Locations	Collection Frequency	Number of Samples Collected	Type of Analysis	Analysis Frequency	Number of Samples Analyzed*
Air Particulate	10	Weekly	519	Gross Beta	Weekly	519
				Gamma Isotopic	Quarterly Composite	40
Air Iodine	10	Weekly	519	Iodine-131	Weekly	519
Direct Radiation (TLD)	86	Quarterly (continuous)	344	Gamma Exposure	Quarterly	344
Surface Water (Grab)	3	Monthly	36	Gamma Isotopic	Monthly	36
				Tritium[a]	Quarterly Composite[a]	12
				Gross Beta	Monthly	36
Surface Water (Intake Composite)	1	Monthly	10	Gamma Isotopic	Monthly	10
				Tritium	Monthly	10
				Gross Beta	Monthly	10
Surface Water (Effluent Composite)	1	Monthly	12	Gamma Isotopic	Monthly	12
				Gross Beta	Monthly	12
				Gross Alpha	Monthly	12
				Tritium	Quarterly Composite	4
				Iodine-131	Monthly	12
Surface Water (Upstream Composite)	2	Monthly	24	Gamma Isotopic	Monthly	24
				Gross Beta	Monthly	24
				Gross Alpha	Monthly	24
				Tritium	Quarterly Composite	8
Well Water	2[a]	Semimonthly	78	Iodine-131	Semimonthly	78
				Gross Alpha	Monthly Composite	36
				Gross Beta	Monthly Composite	36
				Gamma Isotopic	Monthly Composite	36
				Tritium	Quarterly Composite	12
Drinking Water	1	Monthly	12	Gross Alpha	Monthly	12
				Gross Beta	Monthly	12
				Gamma Isotopic	Monthly	12
				Tritium	Quarterly Composite	4
Bottom Sediments	7	Semiannually	15	Gross Alpha	Semiannually	15
				Gross Beta	Semiannually	15
				Gamma Isotopic	Semiannually	15
				Sr-90	Semiannually	15

TABLE B-2 (Cont'd)

Sample Type	Number of Sampling Locations	Collection Frequency	Number of Samples Collected	Type of Analysis	Analysis Frequency	Number of Samples Analyzed*
Shoreline Sediment	7	Semiannually	14	Gross Alpha	Semiannually	14
				Gross Beta	Semiannually	14
				Gamma Isotopic	Semiannually	14
				Sr-90	Semiannually	14
Aquatic Vegetation	6	Semiannually/Bimonthly[b]	22	Gamma Isotopic	Semiannually/Bimonthly	22
Grass	5	Monthly/Semimonthly[c]	90	Gamma Isotopic (including I-131)	Monthly/Semimonthly	90
Vegetables	4	Monthly (during growing season)	45	Gross Beta	Monthly	45
				Gamma Isotopic (including I-131)	Monthly	45
Fish	2	Semiannually	16	Gamma Isotopic	Semiannually	16
Milk	2	Monthly/Semimonthly[c]	34	Gamma Isotopic	Monthly/Semimonthly	34
				Iodine-131	Monthly/Semimonthly	34
				Sr-90	Monthly/Semimonthly	34
Meat	1	Annually (when available)	3	Gamma Isotopic (including I-131)	Annually	3
Soil	10	Triannually/Annually[d]	1	Gross Alpha	Triannually/Annually	1
				Gross Beta		1
				Gamma Isotopic		1

* Number of samples analyzed does not include duplicate analysis, recounts or reanalysis.

a Samples collected at CL-12 are taken prior to water treatment and after water treatment.

b Samples are collected semiannually at CL-105 and bimonthly at all other locations from April through October.

c Samples are collected monthly from November through April and semimonthly May through October.

d Samples are collected annually at CL-16, triennially at all other locations.

TABLE B-3

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

Name of Facility: Clinton Power Station Docket No. 50-461

Location of Facility: DeWitt, Illinois (county, state) Reporting Period January 1 - December 31, 1995

Medium or Pathway Sampled (Unit of Measurement)	Type of Analysis Total Number Performed	Lower Limit of Detection (LLD)	All Indicator Locations: Mean (f) (Range)	Location with Highest Annual Mean: Name Distance and Direction	Mean(f) (Range)	Control Locations: Mean (f) (Range)	Number of Nonroutine Reported Measurements
Direct Radiation (mR/qtr)	TLD 344	NA	17.9(324/324) (11.8 - 25.0)	CL-83 0.5 miles NNW	20.7(4/4) [a] (19.0 - 22.7)	17.8(20/20) (14.2 - 22.4)	0
Air Particulates (pCi/m^3)	Gross Beta 519	NA	0.021(466/466 (0.006 - 0.044)	CL-3 0.7 miles NE	0.022(52/52) (0.010 - 0.044)	0.021(53/53) (0.008 - 0.042)	0
	Gamma Spec 40						
	Be-7	NA	0.086(36/36) (0.048-0.136)	CL-4 0.8 miles SW	0.099(4/4) (0.066 - 0.136)	0.079(4/4) (0.063 - 0.089)	0
	K-40	0.028	LLD	-	LLD	LLD	0
	Co-60	0.0012	LLD	-	LLD	LLD	0
	Nb-95	0.0060	LLD	-	LLD	LLD	0
	Zr-95	0.0022	LLD	-	LLD	LLD	0
	Ru-103	0.0018	LLD	-	LLD	LLD	0
	Ru-106	0.0105	LLD	-	LLD	LLD	0
	Cs-134	0.0012	LLD	-	LLD	LLD	0
	Cs-137	0.0008	LLD	-	LLD	LLD	0
	Ce-141	0.0031	LLD	-	LLD	LLD	0
	Ce-144	0.0065	LLD	-	LLD	LLD	0
Air Iodine (pCi/m^3)	I-131 519	0.07	LLD	-	LLD	LLD	0
Surface Water (pCi/l)	Gross Beta 82	3.5	2.4(66/70) (1.2 - 5.2)	CL-90 0.4 miles SE	2.8(12/12) (1.2 - 5.2)	2.2(12/12) (1.0 - 3.1)	0
	Gross Alpha 36	3.0	1.8(7/36) (0.7 - 4.2)	CL-99 3.5 miles NNE	2.3(3/12) (1.1 - 4.2)	NA	0
	Tritium 34	173	LLD	-	LLD	LLD	0

Note: Column explanations at the end of Table B-3.

TABLE B-3 (Cont'd)

Medium or Pathway Sampled (Unit of Measurement)	Type of Analysis Total Number Performed	Lower Limit of Detection (LLD)	All Indicator Locations: Mean (f) (Range)	Location with Highest Annual Mean: Name Distance and Direction	Location with Highest Annual Mean: Mean(f) (Range)	Control Locations: Mean (f) (Range)	Number of Nonroutine Reported Measurements
Surface Water (cont'd)	I-131 12	0.5	LLD	-	LLD	LLD	0
	Gamma Spec 82						
	Be-7	34.0	LLD	-	LLD	LLD	0
	K-40	46.6	LLD	-	LLD	LLD	0
	Mn-54	2.8	LLD	-	LLD	LLD	0
	Fe-59	7.3	LLD	-	LLD	LLD	0
	Co-58	3.0	LLD	-	LLD	LLD	0
	Co-60	3.4	LLD	-	LLD	LLD	0
	Zn-65	6.4	LLD	-	LLD	LLD	0
	Nb-95	3.8	LLD	-	LLD	LLD	0
	Zr-95	7.7	LLD	-	LLD	LLD	0
	Cs-134	3.4	LLD	-	LLD	LLD	0
	Cs-137	3.3	LLD	-	LLD	LLD	0
	Ba-140	11.4	LLD	-	LLD	LLD	0
	La-140	6.9	LLD	-	LLD	LLD	0
	Ce-144	43.4	LLD	-	LLD	LLD	0
Drinking Water (pCi/l)	Gross Beta 12	2.3	1.9(11/12) (1.2 - 2.3)	CL-14 0 miles	1.9(11/12) (1.2 - 2.3)	NA	0
	Gross Alpha 12	1.3	0.6(1/12)	-	0.6(1/12)	NA	0
	Tritium 4	173	LLD	-	LLD	NA	0
	Gamma Spec 12						
	Be-7	29.2	LLD	-	LLD	NA	0
	K-40	44.0	LLD	-	LLD	NA	0
	Mn-54	2.5	LLD	-	LLD	NA	0
	Fe-59	6.2	LLD	-	LLD	NA	0
	Co-58	2.9	LLD	-	LLD	NA	0
	Co-60	3.0	LLD	-	LLD	NA	0
	Zn-65	5.6	LLD	-	LLD	NA	0
	Nb-95	3.2	LLD	-	LLD	NA	0
	Zr-95	6.0	LLD	-	LLD	NA	0
	Cs-134	3.1	LLD	-	LLD	NA	0
	Cs-137	2.6	LLD	-	LLD	NA	0
	Ba-140	9.3	LLD	-	LLD	NA	0
	La-140	5.0	LLD	-	LLD	NA	0

TABLE B-3 (Cont'd)

Medium or Pathway Sampled (Unit of Measurement)	Type of Analysis Total Number Performed	Lower Limit of Detection (LLD)	All Indicator Locations: Mean (f) (Range)	Location with Highest Annual Mean Name Distance and Direction	Mean(f) (Range)	Control Locations: Mean (f) (Range)	Number of Nonroutine Reported Measurements
Drinking Water (cont'd)	Ce-144	43.3	LLD	-	LLD	NA	0
Well Water (pCi/l)	Gross Beta 36	3.6	2.4(11/36) (1.2 - 4.7)	CL-12U[c] 1.6 miles E	3.3(3/12) (2.6 - 4.7)	NA	0
	Gross Alpha 36	4.0	1.7(3/36) (1.3 - 2.3)	CL-12T 1.6 miles E	2.3(1/12)	NA	0
	I-131 78	0.5	LLD	-	LLD	NA	0
	Tritium 12	173	LLD	-	LLD	NA	0
	Gamma Spec 36						
	Be-7	31.2	LLD	-	LLD	NA	0
	K-40	45.7	LLD	-	LLD	NA	0
	Mn-54	3.4	LLD	-	LLD	NA	0
	Fe-59	7.6	LLD	-	LLD	NA	0
	Co-58	3.3	LLD	-	LLD	NA	0
	Co-60	3.4	LLD	-	LLD	NA	0
	Zn-65	6.3	LLD	-	LLD	NA	0
	Nb-95	4.1	LLD	-	LLD	NA	0
	Zr-95	7.2	LLD	-	LLD	NA	0
	Cs-134	3.1	LLD	-	LLD	NA	0
	Cs-137	2.9	LLD	-	LLD	NA	0
	Ba-140	9.5	LLD	-	LLD	NA	0
	La-140	6.0	LLD	-	LLD	NA	0
	Ce-144	43.2	LLD	-	LLD	NA	0
Milk (pCi/l)	I-131 34	0.6	LLD	-	LLD	LLD	0
	Sr-90 34	NA	1.5(16/16) (0.9 - 2.4)	CL-98 3.7 miles SSW	1.5(16/16) (0.9 - 2.4)	1.5(19/19) (0.9 - 2.2)	0
	Gamma Spec 34						
	Be-7	32.3	LLD	-	LLD	LLD	0
	K-40	-	1949(16/16) (1400 - 2160)	CL-98 3.7 miles SSW	1949(16/16) (1400 - 2160)	1347(19/19) (1110 - 1420)	0
	Mn-54	3.4	LLD	-	LLD	LLD	0
	Fe-59	8.1	LLD	-	LLD	LLD	0
	Co-58	3.4	LLD	-	LLD	LLD	0

TABLE B-3 (Cont'd)

Medium or Pathway Sampled (Unit of Measurement)	Type of Analysis Total Number Performed	Lower Limit of Detection (LLD)	All Indicator Locations: Mean (f) (Range)	Location with Highest Annual Mean: Name Distance and Direction	Location with Highest Annual Mean: Mean(f) (Range)	Control Locations: Mean (f) (Range)	Number of Nonroutine Reported Measurements
Milk (cont'd)	Co-60	5.4	LLD	-	LLD	LLD	0
	Zn-65	9.6	LLD	-	LLD	LLD	0
	Nb-95	3.7	LLD	-	LLD	LLD	0
	Zr-95	8.1	LLD	-	LLD	LLD	0
	Cs-134	4.3	LLD	-	LLD	LLD	0
	Cs-137	4.0	LLD	-	LLD	LLD	0
	Ba-140	12.5	LLD	-	LLD	LLD	0
	La-140	3.3	LLD	-	LLD	LLD	0
	Ce-144	48.3	LLD	-	LLD	LLD	0
Fish (p Ci /g wet)	Gamma Spec 16						
	Be-7	0.13	LLD	-	LLD	LLD	0
	K-40	-	2.85(8/8) (2.16 - 3.25)	CL-19 3.4 miles E	2.85(8/8) (2.16 - 3.25)	2.76(8/8) (2.16 - 3.26)	0
	Mn-54	0.012	LLD	-	LLD	LLD	0
	Fe-59	0.036	LLD	-	LLD	LLD	0
	Co-58	0.012	LLD	-	LLD	LLD	0
	Co-60	0.011	LLD	-	LLD	LLD	0
	Zn-65	0.021	LLD	-	LLD	LLD	0
	Nb-95	0.016	LLD	-	LLD	LLD	0
	Zr-95	0.028	LLD	-	LLD	LLD	0
	Ru-103	0.016	LLD	-	LLD	LLD	0
	Ru-106	0.078	LLD	-	LLD	LLD	0
	Cs-134	0.012	LLD	-	LLD	LLD	0
	Cs-137	0.012	LLD	-	LLD	LLD	0
	Ba-140	0.036	LLD	-	LLD	LLD	0
	La-140	0.007	LLD	-	LLD	LLD	0
	Ce-141	0.030	LLD	-	LLD	LLD	0
	Ce-144	0.058	LLD	-	LLD	LLD	0
Bottom Sediments (pCi/g dry)	Gross Beta 15	9.01	17.77(13/13) (9.01 - 26.77)	CL-105 50 miles S	26.69(2/2) (23.36 - 30.01)	26.69 (2/2) (23.36 - 30.01)	0
	Gross Alpha 15	5.47	9.86(8/13) (4.56 - 15.94)	CL-10 5.0 miles ENE	15.59(2/2) (15.23 - 15.94)	13.97(2/2) (12.03 - 15.91)	0
	Sr-90 15	0.013	0.015(5/13) (0.010 - 0.025)	CL-105 50 miles S	0.018(2/2) (0.015- 0.020)	0.018(2/2) (0.015- 0.020)	0
	Gamma Spec 15						

TABLE B-3 (Cont'd)

Medium or Pathway Sampled (Unit of Measurement)	Type of Analysis Total Number Performed	Lower Limit of Detection (LLD)	All Indicator Locations: Mean (f) (Range)	Location with Highest Annual Mean Name Distance and Direction	Mean(f) (Range)	Control Locations: Mean (f) (Range)	Number of Nonroutine Reported Measurements
Bottom Sediments (cont'd)	Be-7	0.42	0.30(5/13) (0.22 - 0.48)	CL-7C 1.3 miles SE	0.32(3/3) (0.22 -0.48)	LLD -	0
	K-40	-	15.24(13/13) (8.93 - 20.06)	CL-105 50 miles S	21.54(2/2) (20.35 - 22.72)	21.54(2/2) (20.35 - 22.72)	0
	Mn-54	0.050	LLD	-	LLD	LLD	0
	Fe-59	0.080	LLD	-	LLD	LLD	0
	Co-58	0.038	LLD	-	LLD	LLD	0
	Co-60	0.076	LLD	-	LLD	LLD	0
	Zn-65	0.16	LLD	-	LLD	LLD	0
	Nb-95	0.076	LLD	-	LLD	LLD	0
	Zr-95	0.140	LLD	-	LLD	LLD	0
	Cs-134	0.073	LLD	-	LLD	LLD	0
	Cs-137	0.022	0.15(9/13) (0.008 - 0.32)	CL-105 50 miles S	0.39(2/2) (0.36 - 0.41)	0.39(2/2) (0.36 - 0.41)	0
	Ba-140	0.14	LLD	-	LLD	LLD	0
	La-140	0.036	LLD	-	LLD	LLD	0
	Ce-144	0.28	LLD	-	LLD	LLD	0
	Ac-228	-	0.74(13/13) (0.26 - 1.34)	CL-105 50 miles S	1.40(2/2) (1.32 - 1.47)	1.40(2.2) (1.32 - 1.47)	0
	Bi-212	0.23	0.78(11/13) (0.15 - 1.33)	CL-105 50 miles S	1.35(2/2) (1.35)	1.35(2/2) (1.35)	0
	Bi-214	-	0.49(13/13) (0.13 - 0.96)	CL-105 50 miles S	0.99(2/2) (0.59 - 1.38)	0.99(2/2) (0.59 - 1.38)	0
	Pb-212	-	0.72(13/13) (0.19 - 1.30)	CL-105 50 miles S	1.48(2/2) (1.28 - 1.67)	1.48(2/2) (1.28 - 1.67)	0
	Pb-214	-	0.59(13/13) (0.20 - 1.18)	CL-105 50 miles S	1.23(2/2) (0.94 - 1.51)	1.23(2/2) (0.94 - 1.51)	0
	Ra-226	0.42	1.24(12/13) (0.31 - 2.23)	CL-105 50 miles S	2.29(2/2) (1.86 - 2.71)	2.29(2/2) (1.86 - 2.71)	0
	Tl-208	-	0.23(13/13) (0.07 - 0.42)	CL-105 50 miles S	0.51(2/2) (0.45 - 0.56)	0.51(2/2) (0.45 - 0.56)	0
Shoreline Sediments (pCi/g dry)	Gross Beta 14	-	9.03(12/12) (4.63 - 16.45)	CL-89 3.6 miles NNE	12.75(2/2) (9.04 - 16.45)	10.85(2/2) (9.98 - 11.72)	0
	Gross Alpha 14	5.99	3.60(5/12) (1.56 - 7.40)	CL-89 3.6 miles NNE	4.85(2/2) (2.29 - 7.40)	LLD	0
	Sr-90	0.012	LLD	-	LLD	LLD	0
	Gamma Spec 14						

TABLE B-3 (Cont'd)

Medium or Pathway Sampled (Unit of Measurement)	Type of Analysis Total Number Performed	Lower Limit of Detection (LLD)	All Indicator Locations: Mean (f) (Range)	Location with Highest Annual Mean Name Distance and Direction	Mean(f) (Range)	Control Locations: Mean (f) (Range)	Number of Nonroutine Reported Measurements
Shoreline Sediments (cont'd)	Be-7	0.20	0.23(3/12) (0.18 - 0.27)	CL-89 3.6 miles NNE	0.26(2/2) 0.25 -0.27)	LLD	0
	K-40	-	9.62(12/12) (5.84 - 14.89)	CL-7B 2.1 miles SE	12.99(2/2) (12.43 - 13.54)	10.36(2/2) (9.78 - 10.94)	0
	Mn-54	0.022	LLD	-	LLD	LLD	0
	Fe-59	0.078	LLD	-	LLD	LLD	0
	Co-58	0.039	LLD	-	LLD	LLD	0
	Co-60	0.026	LLD	-	LLD	LLD	0
	Zn-65	0.098	LLD	-	LLD	LLD	0
	Nb-95	0.037	LLD	-	LLD	LLD	0
	Zr-95	0.064	LLD	-	LLD	LLD	0
	Cs-134	0.047	LLD	-	LLD	LLD	0
	Cs-137	0.031	0.034(2/12) (0.021 - 0.046)	CL-89 3.6 miles NNE	0.034(2/2) (0.021 - 0.046)	LLD	0
	Ba-140	0.061	LLD	-	LLD	LLD	0
	La-140	0.027	LLD	-	LLD	LLD	0
	Ce-144	0.19	LLD	-	LLD	LLD	0
	Ac-228	-	0.28(12/12) (0.12 - 0.63)	CL-7B 2.1 miles SE	0.55(2/2) (0.46 - 0.63)	0.16(2/2) (0.15 - 0.16)	0
	Bi-212	0.42	0.32(7/12) (0.16 - 0.63)	CL-7B 2.1 miles SE	0.53(1/2)	0.17(2/2) (0.17)	0
	Bi-214	-	0.18(12/12) (0.065 - 0.41)	CL-89 3.6 miles NNE	0.30(2/2) (0.19 - 0.41)	0.10(2/2) (0.10)	0
	Pb-212	-	0.24(12/12) (0.08 -0.60)	CL-7B 2.1 miles SE	0.48(2/2) (0.40 - 0.56)	0.13(2/2) (0.11 - 0.15)	0
	Pb-214	-	0.21(12/12) (0.09 - 0.49)	CL-89 3.6 miles NNE	0.36(2/2) (0.22 - 0.49)	0.13(2/2) (0.11 - 0.15)	0
	Ra-226	0.67	0.45(9/12) (0.21 - 1.14)	CL-7B 2.1 miles SE	0.95(1/2)	0.28(2/2) (0.26 - 0.30)	0
	Tl-208	-	0.09(12/12) (0.03 - 0.20)	CL-89 3.6 miles NNE	0.15(2/2) (0.09 - 0.20)	0.06(2/2) (0.05 - 0.06)	0
Aquatic Vegetation (pCi/g wet)	Gamma Spec 22						
	Be-7	0.90	1.06(14/20) (0.43 - 2.27)	CL-9 2.7 miles ESE	1.36(3/4) (0.55 -2.27)	0.39(1/2)	0
	K-40	1.02	2.07(19/20) (0.60 - 5.46)	CL-19 3.4 miles E	2.70(4/4) (1.21- 5.46)	1.63(2/2) (1.57 - 1.68)	0
	Mn-54	0.045	LLD	-	LLD	LLD	0
	Fe-59	0.16	LLD	-	LLD	LLD	0
	Co-58	0.041	LLD	-	LLD	LLD	0

TABLE B-3 (Cont'd)

Medium or Pathway Sampled (Unit of Measurement)	Type of Analysis Total Number Performed	Lower Limit of Detection (LLD)	All Indicator Locations: Mean (f) (Range)	Location with Highest Annual Mean: Name Distance and Direction	Location with Highest Annual Mean: Mean(f) (Range)	Control Locations: Mean (f) (Range)	Number of Nonroutine Reported Measurements
Aquatic Vegetation (cont'd)	Co-60	0.048	LLD	-	LLD	LLD	0
	Zn-65	0.11	LLD	-	LLD	LLD	0
	Nb-95	0.079	LLD	-	LLD	LLD	0
	Zr-95	0.093	LLD	-	LLD	LLD	0
	Cs-134	0.050	LLD	-	LLD	LLD	0
	Cs-137	0.051	0.050(9/20) (0.028 - 0.088)	CL-19 3.4 miles E	0.070(2/2) (0.052 - 0.088)	0.028(2/4) (0.025 - 0.030)	0
	Ba-140	0.12	LLD	-	LLD	LLD	0
	La-140	0.042	LLD	-	LLD	LLD	0
	Ce-144	0.21	LLD	-	LLD	LLD	0
Vegetables (pCi/g wet)	Gross Beta 45	-	4.51(33/33) (2.34 - 10.13)	CL-118 0.7 miles NNE	5.24(12/12) (2.53 - 10.13)	4.07(12/12) (2.15 - 6.98)	0
	Gamma Spec 45						
	Be-7	0.15	0.19(22/33) (0.09 - 0.42)	CL-115 0.7 miles NE	0.22(6/9) (0.09 - 0.42)	0.16(10/12) (0.07 - 0.25)	0
	K-40	-	4.24(33/33) (1.48 - 9.14)	CL-118 0.7 miles NNE	4.85(12/12) (1.48 - 9.14)	3.95(12/12) (2.19 - 6.40)	0
	Mn-54	0.012	LLD	-	LLD	LLD	0
	Fe-59	0.025	LLD	-	LLD	LLD	0
	Co-58	0.015	LLD	-	LLD	LLD	0
	Co-60	0.016	LLD	-	LLD	LLD	0
	Zn-65	0.029	LLD	-	LLD	LLD	0
	Nb-95	0.015	LLD	-	LLD	LLD	0
	Zr-95	0.022	LLD	-	LLD	LLD	0
	I-131	0.028	LLD	-	LLD	LLD	0
	Cs-134	0.015	LLD	-	LLD	LLD	0
	Cs-137	0.013	LLD	-	LLD	LLD	0
	Ba-140	0.037	LLD	-	LLD	LLD	0
	La-140	0.019	LLD	-	LLD	LLD	0
	Ce-144	0.17	LLD	-	LLD	LLD	0
Grass (pCi/g wet)	Gamma Spec 90						
	Be-7	-	3.61(54/54) (0.35 - 11.65)	CL-116 14 miles WSW	3.97(18/18) (0.60 - 12.20)	3.82(36/36) (0.28 - 12.24)	0
	K-40	-	5.65(54/54) (2.23 - 10.61)	CL-8 2.2 miles E	6.20(18/18) (2.59 - 10.61)	6.06(36/36) (1.45 - 11.79)	0
	Mn-54	0.020	LLD	-	LLD	LLD	0

TABLE B-3 (Cont'd)

Medium or Pathway Sampled (Unit of Measurement)	Type of Analysis Total Number Performed	Lower Limit of Detection (LLD)	All Indicator Locations: Mean (f) (Range)	Location with Highest Annual Mean: Name Distance and Direction	Location with Highest Annual Mean: Mean(f) (Range)	Control Locations: Mean (f) (Range)	Number of Nonroutine Reported Measurements
Grass (cont'd)	Fe-59	0.034	LLD	-	LLD	LLD	0
	Co-58	0.017	LLD	-	LLD	LLD	0
	Co-60	0.026	LLD	-	LLD	LLD	0
	Zn-65	0.072	LLD	-	LLD	LLD	0
	Nb-95	0.033	LLD	-	LLD	LLD	0
	Zr-95	0.041	LLD	-	LLD	LLD	0
	I-131	0.049	LLD	-	LLD	LLD	0
	Cs-134	0.028	LLD	-	LLD	LLD	0
	Cs-137	0.069	LLD	-	LLD	LLD	0
	Ba-140	0.073	LLD	-	LLD	LLD	0
	La-140	0.021	LLD	-	LLD	LLD	0
	Ce-144	0.16	LLD	-	LLD	LLD	0
Meat (pCi/g wet)	Gamma Spec 3						
	Be-7	0.43	LLD	-	LLD	-	0
	K-40	1.40	2.45(2/3) (2.36 - 2.53)	CL-166 2.0 miles NNE	2.45(2/3) (2.36 - 2.53)	NA	0
	Mn-54	0.042	LLD	-	LLD	NA	0
	Fe-59	0.089	LLD	-	LLD	NA	0
	Co-58	0.063	LLD	-	LLD	NA	0
	Co-60	0.046	LLD	-	LLD	NA	0
	Zn-65	0.15	LLD	-	LLD	NA	0
	Nb-95	0.042	LLD	-	LLD	NA	0
	Zr-95	0.056	LLD	-	LLD	NA	0
	Ru-103	0.042	LLD	-	LLD	NA	0
	Ru-106	0.320	LLD	-	LLD	NA	0
	I-131	0.18	LLD	-	LLD	NA	0
	Cs-134	0.048	LLD	-	LLD	NA	0
	Cs-137	0.038	LLD	-	LLD	NA	0
	Ba-140	0.14	LLD	-	LLD	NA	0
	La-140	0.019	LLD	-	LLD	NA	0
	Ce-141	0.082	LLD	-	LLD	NA	0
	Ce-144	0.18	LLD	-	LLD	NA	0
Soil (pCi/g dry)	Gross Beta 1	-	21.86(1/1)	CL-16C 0.6 miles ESE	21.86(1/1) -	NA	0
	Gross Alpha 1		12.03(1/1)	CL-16C 0.6 miles ESE	12.03(1/1) -	NA	0
	Gamma Spec 1						
	Be-7	0.18	LLD	-	LLD	NA	0
	K-40	-	17.71(1/1)	CL-16C 0.6 miles ESE	17.71(1/1) -	NA	0

TABLE B-3 (Cont'd)

Medium or Pathway Sampled (Unit of Measurement)	Type of Analysis Total Number Performed	Lower Limit of Detection (LLD)	All Indicator Locations: Mean (f) (Range)	Location with Highest Annual Mean: Name Distance and Direction	Location with Highest Annual Mean: Mean(f) (Range)	Control Locations: Mean (f) (Range)	Number of Nonroutine Reported Measurements
Soil (cont'd)	Mn-54	0.015	LLD	-	LLD	NA	0
	Fe-59	0.033	LLD	-	LLD	NA	0
	Co-58	0.017	LLD	-	LLD	NA	0
	Co-60	0.019	LLD	-	LLD	NA	0
	Zn-65	0.070	LLD	-	LLD	NA	0
	Nb-95	0.042	LLD	-	LLD	NA	0
	Zr-95	0.036	LLD	-	LLD	NA	0
	Cs-134	0.022	LLD	-	LLD	NA	0
	Cs-137	0.018	LLD		LLD	NA	0
	Ba-140	0.056	LLD	-	LLD	NA	0
	La-140	0.012	LLD	-	LLD	NA	0
	Ce-144	0.11	LLD	-	LLD	NA	0
	Ac-228	-	0.79(1/1)	CL-16C 0.6 miles ESE	0.79(1/1)	NA	0
	Bi-212	-	0.50(1/1)	CL-16C 0.6 miles ESE	0.50(1/1)	NA	0
	Bi-214	-	0.56(1/1)	CL-16C 0.6 miles ESE	0.56(1.1) -	NA	0
	Pb-212	-	0.81(1/1)	CL-16C 0.6 miles ESE	0.81(1/1) -	NA	0
	Pb-214	-	0.59(1/1)	CL-16C 0.6 miles ESE	0.59(1/1) -	NA	0
	Ra-226	-	1.34(1/1)	CL-16C 0.6 miles ESE	1.34(1/1) -	NA	0
	Tl-208	-	0.26(1/1)	CL-16C 0.6 miles ESE	0.26(1/1) -	NA	0

a Highest quarterly mean

b Values excluded due to insufficient sample volume collected

c (T) Treated well water sample or (U) Untreated well water sample

Medium or Pathway Sampled (Unit of Measurement)	Type of Analysis Total Number Performed	Lower Limit of Detection (LLD)	All Indicator Locations: Mean (f) (Range)	Location with Highest Annual Mean Name Distance and Direction	Mean(f) (Range)	Control Locations: Mean (f) (Range)	Number of Nonroutine Reported Measurements
Column 1	Column 2	Column 3	Column 4	Column 5		Column 6	Column 7

T'BLE EXPLANATIONS:

Column 1: The Unit of Measurement describes all the numerical values for LLD, Mean and Range reported for a particular sample medium. For example: the Gross Beta LLD in AIR PARTICULATES is 0.010 pCi/m ^{3}. Abbreviations used are: pCi/m ^{3} = picocurie per cubic meter of sampled air; mR/quarter = exposure measured for calendar quarter period; pCi/l = picocurie per liter of sample; pCi/g = picocurie per gram of sample.

Column 2: The Types of Analyses are described as follows: Gamma Spec = measurement of each radioisotope in a sample using Gamma Spectroscopy; Gross Betas and Gross Alphas = measurement of the radioactivity in a sample by measurement of emitted betas and alphas - no determination of individual radioisotopes is possible; Tritium = measurement of tritium (H-3) is sample by liquid scintillation counting method; TLD = direct measurement of gamma exposure using thermoluminescent dosimeters.

Column 3: LLD reported is the highest of those reported for each of analysis during the year; if all analyses reported positive values, no LLD is reported.

Column 4: Samples taken at Indicator Locations during an operational radiological environmental monitoring program (REMP) reliably measure the quantities of any radioisotopes cycling through the pathways to man from the nuclear station. The reported values are the mean or average for the year of all samples of that type which had values greater than the LLD. "f" is the fraction of all the samples taken at all indicator locations for the medium which reported values greater than the LLD. Example: 7 results greater than LLD out of 15 samples taken would be reported 7/15. The Range is the values of the lowest to highest sample results greater than LLD reported at all the indictor locations for that medium.

Column 5: The Mean, f-fraction and Range along with the name of the location, distance from the CPS gaseous effluent stack in miles, and the letter(s) name of the compass sector in the direction of the sample location from the CPS gaseous effluent stack. The location with the highest annual mean is compared to both indicator and control locations of the medium samples.

Column 6: Control locations are sited in areas with low relative deposition and/or dispersion factors. Sample results are used as reference for the control location.

Column 7: NRC Regulations (Branch Technical Position, Rev. 1, November 1979) include a table of radioisotope concentrations that, if exceeded by confirmed sample measurements, indicate that a Nonroutine Reported Measurement exists. Such measurements require further investigation to validate the source.

APPENDIX C

Glossary

GLOSSARY

activation - the process in which stable atoms become radioactive atoms by absorbing neutrons.

ALARA - acronym for "As Low As Reasonably Achievable" which applies to many facets of nuclear power, i.e., radiation exposure for personnel kept low, minimizes number/activity of effluent discharges.

alpha particle - a charged particle emitted from the nucleus of an atom having a mass and charge equal in magnitude to a helium nucleus which has two protons and two neutrons.

atom - the smallest component of an element having all the properties of that element. Comprised of protons, neutrons and electrons such that the number of protons determines the element.

background radiation - source of radiation that mankind has no control over, such as cosmic (from the sun) and terrestrial (naturally occurring radioactive elements).

beta particle - a charged particle equivalent to an electron if negative or a positron if positive, originating near the nucleus of an atom during radioactive decay or fission.

control location - a sample collection location considered to be far enough away from Clinton Power Station so as not to be affected by station operations.

cosmic radiation - penetrating ionizing radiation originating in outer space.

curie (Ci) - the unit of radioactivity equal to 2.2 trillion disintegrations per minute.

dead water - water that contains no tritium.

dose - a quantity (total or accumulated) of ionizing radiation received.

dose equivalent - a quantity used in radiation protection which expresses all radiations on a common scale for calculating the effective absorbed dose (the unit of dose equivalent is the rem).

ecology - a branch of biology dealing with the relations between organisms and their environment.

electromagnetic radiation - a traveling wave motion resulting from changing electric or magnetic fields. Familiar sources of electromagnetic radiation range from x-rays (and gamma rays) of short wavelength, through the ultraviolet, visible and infrared regions, to radar and radiowaves of relatively long wavelength. All electromagnetic radiation travels in a vacuum at the speed of light.

element - one of 103 known chemical substances that cannot be broken down further without changing its chemical properties.

environment - the aggregate of surrounding things, conditions, or influences.

exposure - a measure of the ionization produced in air by x-ray or gamma radiation. Acute exposure is generally accepted to be large exposure received over a short period of time. Chronic exposure is exposure received over a long period of time.

fission - process by which an atomic nucleus splits into two smaller nuclei and releases neutrons and energy.

fission products - the nuclei formed as part of the fissioning of an atomic nucleus.

gamma rays - high energy, short wavelength electromagnetic radiation emitted from the nucleus.

half-life - the time required for half of a given amount of a radionuclide to decay.

indicator location - a sample collection strategically placed to monitor dcse rate or radioactive material that may be the result of Clinton Power Station operations.

ionization - the process by which a neutral atom or molecule acquires a positive or negative charge.

irradiation - exposure to radiation.

Lower Limit of Detection (LLD) - the smallest amount of sample activity that will give a net count for which there is a confidence at a predetermined level that the activity is present.

microcurie - one millionth of a curie and represents 2.2 million decays per minute.

neutron - one of the three basic parts of an atom which has no charge and is normally found in the nucleus (center) of an atom.

nucleus - the center of an atom containing protons and neutrons; determines the atomic weight and contributes to the net positive charge of an atom. nuclei (plural)

nuclides - atoms which all have the same atomic number and mass number.

periphyton - water plant life (i.e., algae).

radiation - the process by which energy is emitted from a nucleus as particles (alpha, beta, neutron) or waves (gamma).

radionuclide - a radioactive species of an atom characterized by the constitution of its nucleus. The nuclear constitution is specified by the number of protons, number of neutrons, and energy content.

rem - the unit of dose of any ionizing radiation that produces the same biological effects as a unit of absorbed dose of ordinary x-rays. Acronym for Roentgen Equivalent Man.

roentgen - a measure of ionization produced in air by x-ray or gamma radiation.

statistics - the science that deals with the collection, classification, analysis and interpretation of numerical data by use of mathematical theories of probabilities.

target tissue - any tissue or organ of the body in which radiation is absorbed.

terrestrial radiation - source of radiation pertaining to the ground (Earth's crust).

wind rose - a graphic representation indicating from which direction and speed the wind blew.

x-rays - high energy, short wavelength electromagnetic radiation, emitted from the electron shells of an atom.

APPENDIX D

Teledyne 1995 EPA Intercomparison Results

TABLE D-1

U. S. EPA CROSSCHECK PROGRAM[a]

Concentration in pCi/l

Lab Code	Sample Type	Date Collected	Analysis	TBEESML Result ±2σ[b]	EPA Result[c] ±1σ, N=1	Control Limits
STW-723	Water	Jan 1995	Sr-89	17.7±1.5	20.0±5.0	11.3-28.7
			Sr-90	13.7±0.6	15.0±5.0	6.3-23.7
STW-724	Water	Jan 1995	Gr. Alpha	4.3±0.6	5.0±5.0	0.0-13.7
			Gr. Beta	4.7±0.6	5.0±5.0	0.0-13.7
STW-725	Water	Feb 1995	I-131	99.0±4.4	100.0±10.0	82.7-117.3
STW-726	Water	Feb 1995	Ra-226	19.2±0.4	19.1±2.9	14.1-24.1
			Ra-228	19.2±2.0	20.0±5.0	11.3-28.7
			Uranium	24.9±0.2	25.5±3.0	20.3-30.7
STW-727	Water	Mar 1995	H-3	7460.0±87.2	7435.0±744.0	6144.2-8725.8
STW-728	Water	Mar 1995	Pu-239	11.0±0.6	11.1±1.1	9.2-13.0
STW-729	Water	Apr 1995	Gr. Alpha	41.7±0.6	47.5±11.9	26.9-68.1
			Ra-226	13.4±0.5	14.9±2.2	11.1-18.7
			Ra-228	13.1±2.4	15.8±4.0	8.9-22.7
			Uranium	9.5±0.6	10.0±3.0	4.8-15.2
STW-730	Water	Apr 1995	Co-60	29.0±1.7	29.0±5.0	20.3-37.7
			Cs-134	17.3±1.2	20.0±5.0	11.3-28.7
			Cs-137	11.0±1.0	11.0±5.0	2.3-19.7
			Gr. Beta	74.8±3.2	86.6±10.0	69.3-103.9
			Sr-89	17.0±0.0	20.0±5.0	11.3-28.7
			Sr-90	12.7±1.2	15.0±5.0	6.3-23.7
STW-732	Water	Jun 1995	Ra-226	14.7±0.3	14.8±2.2	11.0-18.6
			Ra-228	11.9±0.6	15.0±3.8	8.4-21.6
			Uranium	13.9±0.3	15.2±3.0	10.0-20.4
STW-735	Water	Jul 1995	Gr. Alpha	16.4±2.4	27.5±6.9	15.5-39.5
			Gr. Beta	16.8±1.0	19.4±5.0	10.7-28.1
STW-736	Water	Aug 1995	H-3	4773.7±49.9	4872.0±487.0	4027.1-5716.9

[a] Results obtained by Teledyne's Midwest Laboratory as a participant in the environmental sample crosscheck program operated by the Intercomparison and Calibration Section, Quality Assurance Branch, Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency (EPA), Las Vegas Nevada.

TABLE D-1 (Cont'd)

Lab Code	Sample Type	Date Collected	Analysis	TBEESML Result ±2σ [b]	EPA Result[c] ±1σ, N=1	Control Limits

[b] Unless otherwise indicated, the Teledyne results are given as the mean ±2 standard deviations for three determinations.

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

APPENDIX E

CPS Radiological Environmental Monitoring Results During 1995

TABLE E-1

GROSS BETA AND IODINE-131 ACTIVITY
IN AIR PARTICULATES FOR 1995[a]
($pCi/m^3 \pm 2\sigma$)

DATE COLLECTED	CL-1	CL-2	CL-3	CL-4	CL-6
01/04	0.023 ± 0.003	0.023 ± 0.003	0.024 ± 0.003	0.025 ± 0.003	0.023 ± 0.003
01/11	0.031 ± 0.003	0.034 ± 0.004	0.030 ± 0.004	0.034 ± 0.004	0.033 ± 0.004
01/18	0.014 ± 0.003	0.015 ± 0.003	0.014 ± 0.003	0.014 ± 0.003	0.013 ± 0.003
01/25	0.017 ± 0.003	0.018 ± 0.003	0.016 ± 0.003	0.019 ± 0.003	0.018 ± 0.003
02/01	0.023 ± 0.003	0.023 ± 0.003	0.030 ± 0.004	0.029 ± 0.004	0.029 ± 0.004
02/08	0.025 ± 0.003	0.020 ± 0.003	0.027 ± 0.003	0.023 ± 0.003	0.026 ± 0.003
02/15	0.017 ± 0.003	0.016 ± 0.003	0.021 ± 0.003	0.022 ± 0.003	0.021 ± 0.003
02/22	0.026 ± 0.003	0.028 ± 0.004	0.032 ± 0.004	0.031 ± 0.004	0.031 ± 0.004
03/01	0.013 ± 0.003	0.016 ± 0.003	0.013 ± 0.003	0.015 ± 0.003	0.020 ± 0.004
03/08	0.017 ± 0.003	0.019 ± 0.003	0.020 ± 0.003	0.017 ± 0.003	0.019 ± 0.003
03/15	0.024 ± 0.003	0.021 ± 0.003	0.028 ± 0.003	0.029 ± 0.003	0.029 ± 0.004
03/22	0.019 ± 0.003	0.020 ± 0.003	0.021 ± 0.003	0.019 ± 0.003	0.021 ± 0.003
03/29	0.008 ± 0.003	0.008 ± 0.003	0.010 ± 0.003	0.008 ± 0.003	0.011 ± 0.003
04/05	0.019 ± 0.003	0.019 ± 0.003	0.023 ± 0.003	0.019 ± 0.003	0.018 ± 0.003
04/12	0.017 ± 0.003	0.017 ± 0.003	0.018 ± 0.003	0.016 ± 0.003	0.016 ± 0.003
04/19	0.011 ± 0.003	0.012 ± 0.003	0.012 ± 0.003	0.012 ± 0.003	0.011 ± 0.003
04/26	0.011 ± 0.003	0.010 ± 0.003	0.013 ± 0.003	0.009 ± 0.003	0.011 ± 0.003
05/03	0.012 ± 0.003	0.009 ± 0.003	0.012 ± 0.003	0.011 ± 0.003	0.010 ± 0.003
05/10	0.013 ± 0.003	0.013 ± 0.003	0.016 ± 0.003	0.015 ± 0.003	0.017 ± 0.003
05/17	0.009 ± 0.003	0.011 ± 0.003	0.012 ± 0.003	0.011 ± 0.003	0.013 ± 0.003
05/24	0.010 ± 0.003	0.012 ± 0.003	0.012 ± 0.003	0.011 ± 0.003	0.012 ± 0.003
05/31	0.011 ± 0.003	0.010 ± 0.003	0.010 ± 0.003	0.010 ± 0.003	0.010 ± 0.003
06/07	0.013 ± 0.003	0.014 ± 0.003	0.014 ± 0.003	0.014 ± 0.003	0.015 ± 0.003
06/14	0.010 ± 0.002	0.012 ± 0.003	0.012 ± 0.003	0.013 ± 0.003	0.011 ± 0.003
06/21	0.023 ± 0.003	0.022 ± 0.003	0.027 ± 0.003	0.024 ± 0.003	0.026 ± 0.003
06/28	0.016 ± 0.003	0.019 ± 0.003	0.022 ± 0.003	0.021 ± 0.003	0.018 ± 0.003
07/05	0.011 ± 0.003	0.014 ± 0.003	0.015 ± 0.003	0.015 ± 0.003	0.014 ± 0.003
07/12	0.016 ± 0.003	0.016 ± 0.003	0.020 ± 0.003	0.019 ± 0.003	0.023 ± 0.003
07/19	0.026 ± 0.004	0.028 ± 0.004	0.031 ± 0.004	0.023 ± 0.003	0.029 ± 0.004
07/26	0.016 ± 0.003	0.018 ± 0.003	0.022 ± 0.003	0.018 ± 0.003	0.020 ± 0.003
08/02	0.019 ± 0.003	0.019 ± 0.003	0.025 ± 0.003	0.018 ± 0.003	0.020 ± 0.003
08/09	0.011 ± 0.003	0.013 ± 0.003	0.014 ± 0.003	0.009 ± 0.003	0.014 ± 0.003
08/16	0.019 ±0.003	0.023 ±0.003	0.027 ±0.004	0.024 ±0.003	0.022 ± 0.003

TABLE E-1 (Cont'd)

DATE COLLECTED	CL-1	CL-2	CL-3	CL-4	CL-6
08/23	0.013 ± 0.003	0.015 ± 0.003	0.018 ± 0.003	0.015 ± 0.003	0.016 ± 0.003
08/30	0.037 ± 0.004	0.043 ± 0.004	0.044 ± 0.004	0.044 ± 0.004	0.043 ± 0.004
09/06	0.030 ± 0.004	0.035 ± 0.004	0.032 ± 0.004	0.036 ± 0.004	0.033 ± 0.004
09/13	0.021 ± 0.003	0.023 ± 0.003	0.021 ± 0.003	0.024 ± 0.003	0.022 ± 0.003
09/20	0.016 ± 0.003	0.022 ± 0.003	0.020 ± 0.003	0.021 ± 0.003	0.022 ± 0.003
09/27	0.019 ± 0.003	ND	0.024 ± 0.003	0.022 ± 0.003	0.021 ± 0.003
10/04	0.034 ± 0.004	0.039 ± 0.004	0.038 ± 0.004	0.038 ± 0.004	0.041 ± 0.004
10/11	0.022 ± 0.003	0.025 ± 0.003	0.028 ± 0.003	0.023 ± 0.003	0.021 ± 0.003
10/18	0.026 ± 0.003	0.026 ± 0.003	0.028 ± 0.004	0.030 ± 0.004	0.030 ± 0.004
10/25	0.014 ± 0.003	0.016 ± 0.003	0.016 ± 0.003	0.013 ± 0.003	ND
11/01	0.018 ± 0.003	0.019 ± 0.003	0.019 ± 0.003	0.020 ± 0.003	0.018 ± 0.003
11/08	0.018 ± 0.003	0.026 ± 0.004	0.018 ± 0.003	0.021 ± 0.003	ND
11/15	0.018 ± 0.003	0.020 ± 0.003	0.021 ± 0.003	0.023 ± 0.003	ND
11/22	0.021 ± 0.003	0.023 ± 0.003	0.028 ± 0.004	0.029 ± 0.004	0.022 ± 0.004
11/29	ND	0.025 ± 0.003	0.030 ± 0.003	0.029 ± 0.003	0.023 ± 0.003
12/06	0.024 ± 0.003	ND	0.026 ± 0.003	0.026 ± 0.003	0.020 ± 0.003
12/13	0.026 ± 0.003	0.021 ± 0.003	0.030 ± 0.004	0.024 ± 0.003	0.019 ± 0.003
12/20	0.037 ± 0.003	0.038 ± 0.004	0.041 ± 0.004	0.040 ± 0.004	ND
12/27	0.017 ± 0.003	0.019 ± 0.003	0.019 ± 0.003	0.019 ± 0.003	0.019 ± 0.003
01/03/96	0.020 ± 0.003	0.025 ± 0.004	0.026 ± 0.004	0.028 ± 0.004	0.023 ± 0.003

DATE COLLECTED	CL-7	CL-8	CL-11[b]	CL-15	CL-94
01/04	0.024 ± 0.003	0.022 ± 0.003	0.022 ± 0.003	0.026 ± 0.003	0.024 ± 0.003
01/11	0.026 ± 0.004	0.028 ± 0.004	0.030 ± 0.004	0.028 ± 0.003	0.031 ± 0.004
01/18	0.015 ± 0.003	0.013 ± 0.003	0.012 ± 0.003	0.012 ± 0.003	0.012 ± 0.003
01/25	0.019 ± 0.003	0.018 ± 0.003	0.016 ± 0.003	0.018 ± 0.003	0.019 ± 0.003
02/01	0.023 ± 0.003	0.026 ± 0.003	0.026 ± 0.003	0.027 ± 0.004	0.027 ± 0.004
02/08	0.024 ± 0.003	0.026 ± 0.003	0.020 ± 0.003	0.024 ± 0.003	0.022 ± 0.003
02/15	0.018 ± 0.003	0.018 ± 0.003	0.020 ± 0.003	0.018 ± 0.003	ND
02/22	0.026 ± 0.003	0.028 ± 0.004	0.028 ± 0.004	0.026 ± 0.003	ND
03/01	0.012 ± 0.003	0.015 ± 0.003	0.016 ± 0.003	0.016 ± 0.003	0.016 ± 0.003
03/08	0.013 ± 0.003	0.019 ± 0.003	0.017 ± 0.003	0.018 ± 0.003	0.021 ± 0.003

TABLE E-1 (Cont'd)

DATE COLLECTED	CL-7	CL-8	CL-11[b]	CL-15	CL-94
03/15	0.021 ± 0.003	0.026 ± 0.003	0.024 ± 0.003	0.026 ± 0.003	0.025 ± 0.003
03/22	0.016 ± 0.003	0.023 ± 0.003	0.024 ± 0.003	0.020 ± 0.003	0.024 ± 0.003
03/29	0.008 ± 0.003	0.009 ± 0.003	0.008 ± 0.003	0.007 ± 0.003	0.008 ± 0.003
04/05	0.018 ± 0.003	0.019 ± 0.003	0.020 ± 0.003	0.017 ± 0.003	0.022 ± 0.003
04/12	0.018 ± 0.003	0.019 ± 0.003	0.016 ± 0.003	0.017 ± 0.003	0.018 ± 0.003
04/19	0.013 ± 0.003	0.012 ± 0.003	0.013 ± 0.003	0.012 ± 0.003	0.014 ± 0.003
04/26	0.010 ± 0.003	0.011 ± 0.003	0.011 ± 0.003	0.009 ± 0.002	0.013 ± 0.003
05/03	0.011 ± 0.003	0.012 ± 0.003	0.013 ± 0.003	0.009 ± 0.003	0.013 ± 0.003
05/10	0.014 ± 0.003	0.013 ± 0.003	0.015 ± 0.003	0.014 ± 0.003	0.013 ± 0.003
05/17	0.008 ± 0.002	0.012 ± 0.003	0.011 ± 0.003	0.010 ± 0.003	0.011 ± 0.003
05/24	0.010 ± 0.003	0.011 ± 0.003	0.011 ± 0.003	0.013 ± 0.003	0.006 ± 0.002
05/31	0.007 ± 0.002	0.009 ± 0.003	0.011 ± 0.003	0.011 ± 0.003	0.012 ± 0.003
06/07	0.010 ± 0.003	0.016 ± 0.003	0.014 ± 0.003	0.015 ± 0.003	0.013 ± 0.003
06/14	0.010 ± 0.002	0.010 ± 0.002	0.012 ± 0.003	0.009 ± 0.002	0.013 ± 0.003
06/21	0.017 ± 0.003	0.024 ± 0.003	0.025 ± 0.003	0.021 ± 0.003	0.028 ± 0.003
06/28	0.013 ± 0.003	0.018 ± 0.003	0.021 ± 0.003	0.019 ± 0.003	0.024 ± 0.003
07/05	0.012 ± 0.003	0.012 ± 0.003	0.015 ± 0.003	0.013 ± 0.003	0.014 ± 0.003
07/12	0.015 ± 0.003	0.020 ± 0.003	0.017 ± 0.003	0.018 ± 0.003	0.018 ± 0.003
07/19	0.026 ± 0.003	0.029 ± 0.004	0.027 ± 0.003	0.030 ± 0.004	ND
07/26	0.017 ± 0.003	0.017 ± 0.003	0.019 ± 0.003	0.021 ± 0.003	0.020 ± 0.003
08/02	0.017 ± 0.003	0.021 ± 0.003	0.022 ± 0.003	0.022 ± 0.003	0.023 ± 0.003
08/09	0.010 ± 0.003	0.012 ± 0.003	0.014 ± 0.003	0.011 ± 0.003	0.013 ± 0.003
08/16	0.023 ± 0.003	0.020 ± 0.003	0.023 ± 0.003	0.026 ± 0.003	0.026 ± 0.003
08/23	0.017 ± 0.003	0.010 ± 0.003	0.019 ± 0.003	0.016 ± 0.003	0.011 ± 0.003
08/30	0.042 ± 0.004	0.039 ± 0.004	0.041 ± 0.004	0.044 ± 0.004	0.044 ± 0.004
09/06	0.029 ± 0.004	0.032 ± 0.004	0.021 ± 0.003	0.033 ± 0.004	0.034 ± 0.004
09/13	0.024 ± 0.003	0.026 ± 0.003	0.020 ± 0.003	ND	0.024 ± 0.003
09/20	0.019 ± 0.003	0.022 ± 0.003	0.018 ± 0.003	0.020 ± 0.003	0.018 ± 0.003
09/27	0.022 ± 0.003	0.023 ± 0.003	0.027 ± 0.003	0.023 ± 0.003	0.021 ± 0.003
10/04	0.031 ± 0.004	0.043 ± 0.004	0.040 ± 0.004	0.036 ± 0.004	0.039 ± 0.004
10/11	0.022 ± 0.003	0.032 ± 0.004	0.025 ± 0.003	0.021 ± 0.003	0.029 ± 0.004
10/18	0.027 ± 0.003	0.026 ± 0.003	0.028 ± 0.004	0.027 ± 0.003	0.027 ± 0.003
10/25	0.015 ± 0.003	0.014 ± 0.003	0.014 ± 0.003	0.014 ± 0.003	0.016 ± 0.003
11/01	0.016 ± 0.003	0.018 ± 0.003	0.017 ± 0.003	0.019 ± 0.003	0.019 ± 0.003

TABLE E-1 (Cont'd)

DATE COLLECTED	CL-7	CL-8	CL-11[b]	CL-15	CL-94
11/08	0.019 ± 0.003	0.021 ± 0.003	0.023 ± 0.003	0.019 ± 0.003	0.020 ± 0.003
11/15	0.019 ± 0.003	0.020 ± 0.003	0.023 ± 0.003	0.018 ± 0.003	0.020 ± 0.003
11/22	0.023 ± 0.004	0.030 ± 0.004	0.029 ± 0.004	0.025 ± 0.003	0.026 ± 0.004
11/29	0.029 ± 0.003	0.028 ± 0.003	0.038 ± 0.004	0.032 ± 0.003	0.029 ± 0.003
12/06	0.028 ± 0.003	0.028 ± 0.003	0.026 ± 0.003	0.026 ± 0.003	0.026 ± 0.003
12/13	0.023 ± 0.003	0.025 ± 0.003	0.027 ± 0.003	0.025 ± 0.003	0.025 ± 0.003
12/20	0.038 ± 0.004	0.039 ± 0.004	0.042 ± 0.004	0.033 ± 0.004	0.034 ± 0.004
12/27	0.019 ± 0.003	0.020 ± 0.003	0.018 ± 0.003	0.018 ± 0.003	0.019 ± 0.003
01/03/96	0.022 ± 0.003	0.022 ± 0.003	0.024 ± 0.004	0.025 ± 0.003	0.025 ± 0.003

a all I-131 activity was <0.07 pCi/m^3

b control location, all other locations are indicators

ND No data

TABLE E-2

GAMMA ISOTOPIC ACTIVITY IN AIR PARTICULATES FOR 1995

(pCi/m^3 ±2σ)

SITE	ISOTOPE	1ST QTR	2ND QTR	3RD QTR	4TH QTR
CL-1	Be-7	0.074± 0.010	0.097± 0.012	0.090± 0.011	0.048± 0.011
	K-40	<0.020	<0.020	<0.017	<0.024
	Co-60	<0.0008	<0.0004	<0.0006	<0.0003
	Nb-95	<0.0005	<0.0005	<0.0011	<0.0007
	Zr-95	<0.0009	<0.0014	<0.0011	<0.0005
	Ru-103	<0.0005	<0.0008	<0.0008	<0.0005
	Ru-106	<0.0021	<0.0018	<0.0054	<0.0054
	Cs-134	<0.0003	<0.0002	<0.0004	<0.0004
	Cs-137	<0.0005	<0.0008	<0.0004	<0.0002
	Ce-141	<0.0009	<0.0011	<0.0015	<0.0019
	Ce-144	<0.0036	<0.0037	<0.0036	<0.0042
CL-2	Be-7	0.081± 0.010	0.097± 0.013	0.101± 0.016	0.061± 0.013
	K-40	<0.020	<0.020	<0.024	<0.024
	Co-60	<0.0007	<0.0005	<0.0006	<0.0005
	Nb-95	<0.0008	<0.0006	<0.0010	<0.0007
	Zr-95	<0.0007	<0.0005	<0.0009	<0.0006
	Ru-103	<0.0008	<0.0008	<0.0012	<0.0007
	Ru-106	<0.0038	<0.0037	<0.0046	<0.0028
	Cs-134	<0.0005	<0.0003	<0.0012	<0.0004
	Cs-137	<0.0004	<0.0003	<0.0008	<0.0005
	Ce-141	<0.0008	<0.0007	<0.0030	<0.0013
	Ce-144	<0.0021	<0.0041	<0.0019	<0.0046
CL-3	Be-7	0.086± 0.012	0.106± 0.011	0.108± 0.015	0.068± 0.012
	K-40	<0.020	<0.019	<0.024	<0.024
	Co-60	<0.0008	<0.0003	<0.0003	<0.0003
	Nb-95	<0.0004	<0.0008	<0.0008	<0.0006
	Zr-95	<0.0008	<0.0022	<0.0007	<0.0004
	Ru-103	<0.0005	<0.0007	<0.0011	<0.0009
	Ru-106	<0.0022	<0.0054	<0.0062	<0.0105
	Cs-134	<0.0007	<0.0009	<0.0004	<0.0002
	Cs-137	<0.0005	<0.0004	<0.0005	<0.0005
	Ce-141	<0.0010	<0.0012	<0.0009	<0.0017
	Ce-144	<0.0030	<0.0018	<0.0038	<0.0035

TABLE E-2 (Cont'd)

SITE	ISOTOPE	1ST QTR	2ND QTR	3RD QTR	4TH QTR
CL-4	Be-7	0.089± 0.010	0.104± 0.013	0.136± 0.017	0.066± 0.013
	K-40	<0.020	<0.020	<0.024	<0.025
	Co-60	<0.000	<0.0003	<0.0006	<0.0006
	Nb-95	<0.0007	<0.0006	<0.0009	<0.0006
	Zr-95	<0.0002	<0.0007	<0.0007	<0.0011
	Ru-103	<0.0008	<0.0007	<0.0018	<0.0004
	Ru-106	<0.0034	<0.0055	<0.0058	<0.0025
	Cs-134	<0.0006	<0.0004	<0.0004	<0.0006
	Cs-137	<0.0003	<0.0006	<0.0006	<0.0003
	Ce-141	<0.0013	<0.0014	<0.0015	<0.0013
	Ce-144	<0.0033	<0.0039	<0.0025	<0.0033
CL-6	Be-7	0.086± 0.010	0.111± 0.016	0.123± 0.019	0.070± 0.014
	K-40	<0.021	<0.020	<0.024	<0.028
	Co-60	<0.0009	<0.0005	<0.0004	<0.0003
	Nb-95	<0.0008	<0.0007	<0.0004	<0.0003
	Zr-95	<0.0008	<0.0015	<0.0007	<0.0007
	Ru-103	<0.0007	<0.0008	<0.0007	<0.0009
	Ru-106	<0.0037	<0.0054	<0.0066	<0.0020
	Cs-134	<0.0007	<0.0006	<0.0002	<0.0007
	Cs-137	<0.0006	<0.0006	<0.0005	<0.0004
	Ce-141	<0.0012	<0.0016	<0.0019	<0.0018
	Ce-144	<0.0017	<0.0038	<0.0042	<0.0040
CL-7	Be-7	0.064± 0.010	0.077± 0.010	0.101± 0.014	0.059± 0.011
	K-40	<0.020	<0.020	<0.023	<0.024
	Co-60	<0.0008	<0.0004	<0.0004	<0.0003
	Nb-95	<0.0004	<0.0004	<0.0010	<0.0012
	Zr-95	<0.0010	<0.0015	<0.0008	<0.0009
	Ru-103	<0.0010	<0.0008	<0.0007	<0.0009
	Ru-106	<0.0035	<0.0028	<0.0065	<0.0058
	Cs-134	<0.0004	<0.0006	<0.0008	<0.0002
	Cs-137	<0.0003	<0.0003	<0.0007	<0.0006
	Ce-141	<0.0006	<0.0015	<0.0013	<0.0018
	Ce-144	<0.0037	<0.0032	<0.0049	<0.0030
CL-8	Be-7	0.080± 0.011	0.092± 0.011	0.114± 0.014	0.067± 0.012
	K-40	<0.019	<0.020	<0.024	<0.025
	Co-60	<0.0008	<0.0005	<0.0006	<0.0004
	Nb-95	<0.0006	<0.0007	<0.0005	<0.0010
	Zr-95	<0.0008	<0.0012	<0.0013	<0.0006
	Ru-103	<0.0004	<0.0008	<0.0012	<0.0008
	Ru-106	<0.0041	<0.0062	<0.0048	<0.0036
	Cs-134	<0.0006	<0.0007	<0.0003	<0.0003
	Cs-137	<0.0003	<0.0006	<0.0004	<0.0004
	Ce-141	<0.0013	<0.0007	<0.0031	<0.0016
	Ce-144	<0.0015	<0.0020	<0.0042	<0.0033

TABLE E-2 (Cont'd)

SITE	ISOTOPE	1ST QTR	2ND QTR	3RD QTR	4TH QTR
CL-11	Be-7	0.076± 0.010	0.089± 0.011	0.087± 0.013	0.063± 0.011
	K-40	<0.020	<0.020	<0.020	<0.024
	Co-60	<0.0008	<0.0003	<0.0005	<0.0005
	Nb-95	<0.0005	<0.0006	<0.0010	<0.0003
	Zr-95	<0.0014	<0.0009	<0.0014	<0.0005
	Ru-103	<0.0007	<0.0009	<0.0007	<0.0004
	Ru-106	<0.0050	<0.0056	<0.0028	<0.0059
	Cs-134	<0.0004	<0.0006	<0.0007	<0.0007
	Cs-137	<0.0002	<0.0006	<0.0005	<0.0003
	Ce-141	<0.0012	<0.0014	<0.0012	<0.0016
	Ce-144	<0.0032	<0.0065	<0.0039	<0.0049
CL-15	Be-7	0.069± 0.009	0.095± 0.011	0.084± 0.013	0.061± 0.010
	K-40	<0.020	<0.020	<0.027	<0.024
	Co-60	<0.0009	<0.0003	<0.0006	<0.0003
	Nb-95	<0.0006	<0.0004	<0.0006	<0.0006
	Zr-95	<0.0008	<0.0011	<0.0013	<0.0005
	Ru-103	<0.0007	<0.0010	<0.0008	<0.0007
	Ru-106	<0.0034	<0.0039	<0.0084	<0.0030
	Cs-134	<0.0004	<0.0006	<0.0004	<0.0006
	Cs-137	<0.0004	<0.0003	<0.0008	<0.0004
	Ce-141	<0.0010	<0.0012	<0.0016	<0.0007
	Ce-144	<0.0016	<0.0040	<0.0040	<0.0038
CL-94	Be-7	0.067± 0.011	0.102± 0.012	0.089± 0.015	0.059± 0.012
	K-40	<0.023	<0.020	<0.022	<0.024
	Co-60	<0.0012	<0.0005	<0.0005	<0.0007
	Nb-95	<0.0007	<0.0011	<0.0005	<0.0005
	Zr-95	<0.0012	<0.0015	<0.0008	<0.0008
	Ru-103	<0.0006	<0.0004	<0.0009	<0.0008
	Ru-106	<0.0060	<0.0036	<0.0054	<0.0073
	Cs-134	<0.0006	<0.0007	<0.0005	<0.0005
	Cs-137	<0.0005	<0.0005	<0.0005	<0.0008
	Ce-141	<0.0015	<0.0008	<0.0014	<0.0007
	Ce-144	<0.0033	<0.0024	<0.0021	<0.0043

TABLE E-3

1995 CPS REMP QUARTERLY TLD RESULTS
(mR/quarter Net Exposure)

Location	1ST QTR	2ND QTR	3RD QTR	4TH QTR
CL-1	15.3± 0.3	17.3± 0.2	16.1± 0.2	20.6±0.2
CL-2	16.9± 0.3	17.3± 0.2	16.1± 0.2	20.6±0.3
CL-3	16.2± 0.2	16.3± 0.2	16.7± 0.2	20.1±0.2
CL-4	16.7± 0.6	15.6± 0.3	16.7± 0.3	18.1±0.3
CL-5	18.0± 0.5	17.0± 0.2	17.8± 0.2	20.2±0.2
CL-6	14.3± 0.3	14.1± 0.2	14.0± 0.2	15.3±0.2
CL-7	16.5± 0.4	14.8± 0.2	15.7± 0.2	17.2±0.3
CL-8	14.7± 0.2	15.0± 0.3	16.3± 0.2	17.0±0.2
CL-11	14.2± 0.2	14.9± 0.2	15.4± 0.2	17.0±0.2
CL-15	12.7± 0.4	14.1± 0.2	14.7± 0.2	16.2±0.2
CL-20	18.9± 0.2	18.7± 0.2	18.8± 0.2	21.4±0.2
CL-21	19.0± 0.2	17.1± 0.2	18.9± 0.2	20.1±0.2
CL-22	18.6± 0.2	15.4± 0.4	16.7± 0.2	18.1±0.4
CL-23	14.7± 0.3	12.8± 0.2	13.1± 0.3	15.7±0.2
CL-24	17.0± 0.6	15.7± 0.2	16.9± 0.4	18.6±0.4
CL-25	11.8± 0.4	13.0± 0.3	13.1± 0.2	15.3±0.2
CL-26	14.8± 0.2	13.6± 0.2	14.8± 0.2	15.6±0.2
CL-27	15.3± 0.3	15.5± 0.3	15.2± 0.2	18.2±0.3
CL-28	16.5± 0.3	16.3± 0.2	17.2± 0.4	20.1±0.2
CL-29	17.4± 0.3	17.5± 0.2	18.9± 0.2	20.5±0.2
CL-30	17.0± 0.4	17.0± 0.2	18.4± 0.2	20.0±0.2
CL-31	14.2± 0.2	14.5± 0.2	14.0± 0.2	17.3±0.2
CL-32	15.6± 0.3	15.5± 0.3	15.8± 0.2	17.9±0.2
CL-33	18.2± 0.6	17.5± 0.2	18.6± 0.2	20.7±0.2
CL-34	15.6± 0.2	18.3± 0.2	18.4± 0.2	22.1±0.2
CL-35	17.1± 0.4	15.0± 0.3	16.5± 0.3	18.0±0.2
CL-36	16.7± 0.3	15.7± 0.4	18.5± 0.2	18.7±0.4
CL-37	17.3± 0.4	15.8± 0.4	18.3± 0.2	19.7±0.2
CL-38	16.9± 0.5	17.1± 0.2	19.6± 0.3	19.6±0.2
CL-39	16.5± 0.3	14.6± 0.3	16.8± 0.2	18.4±0.2
CL-40	16.3± 0.4	16.5± 0.6	17.6± 0.2	18.3±0.2
CL-41	18.4± 0.7	16.3± 0.2	18.8± 0.2	20.0±0.2
CL-42	17.1± 0.4	14.9± 0.2	18.3± 0.2	18.0±0.3
CL-43	17.7± 0.2	17.1± 0.2	19.1± 0.2	20.4±0.2
CL-44	18.9± 0.2	17.2± 0.2	18.8± 0.2	20.0±0.2
CL-45	17.5± 0.2	18.6± 0.2	20.4± 0.3	21.7±0.2
CL-46	15.8± 0.2	17.1± 0.2	17.0± 0.4	18.7±0.4
CL-47	17.9± 0.5	17.5± 0.2	17.9± 0.2	20.9±0.2
CL-48	17.1± 0.4	17.9± 0.2	18.4± 0.2	21.7±0.2
CL-49	18.8± 0.3	17.8± 0.2	20.0± 0.4	22.6±0.2
CL-50	18.6± 0.2	17.7± 0.3	19.3± 0.2	25.0±0.3
CL-51	16.9± 0.3	17.7± 0.2	18.1± 0.2	22.5±0.3
CL-52	17.6± 0.2	16.8± 0.2	18.3± 0.2	20.4±0.3
CL-53	16.1± 0.3	15.4± 0.2	17.9± 0.2	20.5±0.3

TABLE E-3 (Cont'd)

Location	1[ST] QTR	2[ND] QTR	3[RD] QTR	4[TH] QTR
CL-54	16.7± 0.3	15.7± 0.2	16.9±0.2	19.6±0.2
CL-55	17.1± 0.4	17.3± 0.2	18.5±0.3	20.9±0.2
CL-56	18.9± 0.2	17.5± 0.2	18.7±0.2	22.4±0.3
CL-57	19.3± 0.2	15.8± 0.3	19.5±0.2	20.0±0.2
CL-58	19.3± 0.2	17.7± 0.2	19.4±0.2	20.7±0.2
CL-59	18.9± 0.2	18.3± 0.2	18.3±0.2	22.5±0.4
CL-60	18.8± 0.2	17.9± 0.3	19.8±0.2	22.6±0.3
CL-61	19.1± 0.2	17.5± 0.2	19.4±0.3	22.5±0.3
CL-62	17.9± 0.4	17.9± 0.2	18.6±0.2	22.1±0.3
CL-63	19.7± 0.2	18.1± 0.2	20.1±0.5	24.0±0.2
CL-64	17.5± 0.2	17.9± 0.2	19.0±0.2	23.4±0.6
CL-65	19.0± 0.3	18.5± 0.2	20.5±0.2	22.6±0.2
CL-66	14.7± 0.3	14.7± 0.3	15.2±0.3	18.2±0.2
CL-67	17.1± 0.4	16.5± 0.2	18.4±0.2	20.2±0.2
CL-68	15.6± 0.3	15.9± 0.3	16.8±0.2	20.1±0.2
CL-69	15.5± 0.4	15.6± 0.4	16.1±0.2	18.2±0.3
CL-70	16.6± 0.3	15.7± 0.2	17.7±0.2	19.3±0.2
CL-71	15.3± 0.3	15.9± 0.2	15.9±0.3	20.1±0.2
CL-72	17.0± 0.5	17.1± 0.2	19.0±0.2	21.1±0.3
CL-73	19.3± 0.3	17.5± 0.3	21.3±0.2	22.5±0.4
CL-74	17.2± 0.3	17.9± 0.2	18.2±0.2	21.3±0.3
CL-75	18.3± 0.2	17.9± 0.2	19.6±0.2	21.5±0.3
CL-76	18.8± 0.2	19.4± 0.2	19.6±0.2	22.0±0.3
CL-77	16.3± 0.3	17.8± 0.2	17.9±0.2	21.1±0.3
CL-78	16.2± 0.4	18.9± 0.2	17.8±0.2	23.3±0.6
CL-79	17.2± 0.3	18.3± 0.3	19.9±0.5	21.4±0.2
CL-80	18.4± 0.2	16.4± 0.2	20.4±0.2	20.0±0.3
CL-81	17.3± 0.4	18.9± 0.2	18.8±0.3	22.7±0.3
CL-82	16.8± 0.4	15.7± 0.2	18.9±0.2	19.8±0.3
CL-83	19.5± 0.3	19.0± 0.3	21.4±0.2	22.7±0.2
CL-84	16.8± 0.5	15.9± 0.3	18.2±0.2	19.4±1.8
CL-85	17.1± 0.3	17.6± 0.2	19.7±0.4	20.0±0.2
CL-86	17.2± 0.5	15.6± 0.3	18.3±0.2	17.6±0.3
CL-87	16.3± 0.2	17.5± 0.3	18.6±0.2	22.0±0.2
CL-95	17.4± 0.4	18.0± 0.3	20.1±0.4	18.0±0.4
CL-96	16.0± 0.4	15.7± 0.3	16.7±0.2	22.4±0.3
CL-97	19.0± 0.2	17.9± 0.3	18.5±0.2	20.0±0.2
CL-109	15.1± 0.2	15.5± 0.3	16.1±0.2	17.8±0.3
CL-110	16.3± 0.3	17.7± 0.2	17.6±0.6	21.8±0.2
CL-111	18.8± 0.3	18.9± 0.3	18.9±0.2	24.0±0.2
CL-112	16.7± 0.3	15.7± 0.3	16.7±0.2	19.8±0.3
CL-113	17.1± 0.4	16.3± 0.2	17.8±0.2	20.4±0.2

TABLE E-4

SURFACE WATER BETA AND GAMMA ISOTOPIC ACTIVITY
(pCi/l) - CL-9

Date Collected	01-25-95	02-22-95	03-29-95	04-26-95	05-31-95	06-28-95
Gross Beta	2.3± 0.6	1.9± 0.6	1.7± 0.4	1.8± 0.6	2.9± 0.6	2.5± 0.4
Be-7	< 14.6	< 10.3	< 9.8	< 17.2	< 15.7	< 20.3
K-40	< 33.4	< 33.1	< 23.9	< 33.3	< 29.2	< 31.9
Mn-54	< 0.7	< 1.6	< 1.2	< 2.0	< 1.3	< 1.5
Fe-59	< 2.8	< 3.2	< 2.1	< 2.1	< 2.0	< 2.7
Co-58	< 0.8	< 1.1	< 0.6	< 1.8	< 2.0	< 2.1
Co-60	< 1.5	< 2.1	< 1.6	< 2.0	< 1.8	< 1.7
Zn-65	< 2.4	< 1.8	< 1.4	< 2.5	< 2.5	< 3.5
Nb-95	< 1.9	< 2.1	< 0.9	< 2.1	< 1.9	< 2.4
Zr-95	< 1.7	< 5.3	< 2.3	< 2.5	< 4.0	< 2.4
Cs-134	< 1.7	< 1.2	< 1.7	< 1.0	< 2.0	< 2.1
Cs-137	< 2.0	< 1.8	< 1.8	< 2.6	< 2.2	< 1.2
Ba-140[a]	< 6.6	< 6.3	< 2.9	< 4.2	< 5.6	< 7.0
La-140[a]	< 0.9	< 1.6	< 1.0	< 1.6	< 1.7	< 1.1
Ce-144	< 27.5	< 9.7	< 23.3	< 19.2	< 27.0	< 21.8

Date Collected	07-26-95	08-30-95	09-27-95	10-25-95	11-29-95	12-27-95
Gross Beta	1.6± 0.6	2.4± 0.6	3.0± 0.6	1.6± 0.6	3.0± 0.6	3.2± 0.9
Be-7	< 10.1	< 20.1	< 17.8	< 23.6	< 14.8	< 23.6
K-40	< 27.0	< 34.4	< 27.2	< 37.1	< 24.4	< 38.3
Mn-54	< 1.7	< 1.7	< 1.9	< 1.1	< 0.8	< 2.6
Fe-59	< 4.2	< 4.1	< 3.4	< 5.9	< 1.7	< 4.5
Co-58	< 1.0	< 2.0	< 1.8	< 2.6	< 1.5	< 1.8
Co-60	< 2.0	< 1.7	< 2.2	< 1.4	< 1.1	< 3.0
Zn-65	< 3.0	< 3.4	< 3.2	< 1.9	< 3.9	< 5.4
Nb-95	< 2.6	< 2.6	< 2.0	< 3.1	< 1.2	< 2.8
Zr-95	< 4.2	< 4.1	< 2.6	< 6.1	< 3.7	< 5.6
Cs-134	< 1.9	< 1.1	< 2.2	< 2.4	< 1.5	< 2.6
Cs-137	< 1.8	< 1.8	< 1.8	< 1.1	< 1.6	< 2.8
Ba-140[a]	< 7.3	< 6.8	< 3.3	< 7.2	< 5.0	< 9.9
La-140[a]	< 1.4	< 2.2	< 1.5	< 0.9	< 1.2	< 4.1
Ce-144	< 29.2	< 30.3	< 26.0	< 32.7	< 23.7	< 17.4

[a] LLD at time of counting.

TABLE E-5

SURFACE WATER BETA AND GAMMA ISOTOPIC ACTIVITY

(pCi/l) - CL-10 (control)

Date Collected	01-25-95	02-22-95	03-29-95	04-26-95	05-31-95	06-28-95
Gross Beta	1.8± 0.6	1.7± 0.6	1.5± 0.5	1.0± 0.6	2.8± 0.6	2.7± 0.6
Be-7	< 13.6	< 21.7	< 12.9	< 15.6	< 21.3	< 22.3
K-40	< 46.6	< 38.9	< 27.6	< 27.9	< 33.7	< 39.0
Mn-54	< 2.0	< 2.5	< 1.1	< 1.9	< 1.3	< 2.7
Fe-59	< 4.8	< 5.2	< 3.0	< 4.3	< 2.0	< 3.7
Co-58	< 2.1	< 2.8	< 1.3	< 1.1	< 1.9	< 1.4
Co-60	< 1.2	< 2.4	< 1.4	< 0.9	< 2.6	< 1.8
Zn-65	< 2.3	< 4.9	< 2.5	< 4.0	< 3.4	< 2.4
Nb-95	< 2.6	< 3.0	< 1.4	< 2.2	< 2.1	< 2.6
Zr-95	< 4.8	< 5.6	< 1.4	< 3.8	< 5.4	< 5.3
Cs-134	< 1.3	< 3.0	< 1.[illegible]	< 1.9	< 1.3	< 3.1
Cs-137	< 2.1	< 2.4	< 1.2	< 1.9	< 1.4	< 3.0
Ba-140[a]	< 4.1	< 9.9	< 5.0	< 6.3	< 8.2	< 9.3
La-140[a]	< 2.0	< 1.0	< 0.9	< 2.0	< 0.9	< 3.2
Ce-144	< 33.2	< 24.8	< 18.6	< 28.8	< 19.5	< 16.4

Date Collected	07-26-95	08-30-95	09-27-95	10-25-95	11-29-95	12-27-95
Gross Beta	2.4± 0.6	2.5± 0.6	2.7± 0.6	3.1± 0.6	2.5± 0.6	1.9± 0.6
Be-7	< 14.1	< 27.7	< 24.6	< 23.5	< 12.8	< 19.6
K-40	< 40.7	< 41.5	< 37.0	< 28.7	< 20.2	< 32.8
Mn-54	< 2.4	< 2.7	< 2.0	< 2.2	< 0.6	< 1.8
Fe-59	< 6.4	< 3.3	< 4.4	< 2.6	< 3.0	< 5.1
Co-58	< 2.4	< 2.2	< 2.2	< 1.2	< 1.3	< 2.0
Co-60	< 2.7	< 2.7	< 2.4	< 1.8	< 1.3	< 1.9
Zn-65	< 2.3	< 2.5	< 2.4	< 3.5	< 4.6	< 4.0
Nb-95	< 3.2	< 2.0	< 2.9	< 3.2	< 2.1	< 2.8
Zr-95	< 4.2	< 4.9	< 2.5	< 4.5	< 1.5	< 3.0
Cs-134	< 2.0	< 2.7	< 2.1	< 1.9	< 1.4	< 2.1
Cs-137	< 2.5	< 2.3	< 2.1	< 1.7	< 1.4	< 2.2
Ba-140[a]	< 8.0	< 8.7	< 6.3	< 3.7	< 3.3	< 6.4
La-140[a]	< 2.9	< 2.5	< 1.9	< 1.8	< 1.7	< 3.5
Ce-144	< 18.5	< 25.0	< 30.2	< 28.9	< 18.5	< 32.4

[a]LLD at time of counting.

TABLE E-6

SURFACE WATER BETA AND GAMMA ISOTOPIC ACTIVITY
(pCi/l) - CL-13

Date Collected	01-25-95	02-22-95	03-29-95	04-26-95	05-31-95	06-28-95
Gross Beta	1.3± 0.6	2.2± 0.6	1.8± 0.6	1.4± 0.6	2.0± 0.6	3.0± 0.6
Be-7	< 12.7	< 11.8	< 28.2	< 20.3	< 13.5	< 20.1
K-40	< 33.5	< 42.9	< 28.9	< 31.2	< 42.6	< 32.7
Mn-54	< 1.0	< 2.8	< 2.7	< 2.1	< 2.4	< 2.3
Fe-59	< 1.8	< 4.0	< 4.6	< 5.1	< 6.0	< 2.3
Co-58	< 1.2	< 1.3	< 1.4	< 1.0	< 2.6	< 2.0
Co-60	< 1.9	< 1.8	< 2.6	< 1.1	< 2.5	< 1.7
Zn-65	< 5.1	< 2.2	< 5.3	< 3.0	< 6.4	< 3.2
Nb-95	< 1.8	< 2.8	< 1.8	< 2.1	< 2.9	< 2.3
Zr-95	< 3.8	< 5.0	< 3.6	< 5.2	< 3.3	< 2.4
Cs-134	< 1.8	< 3.3	< 2.3	< 1.5	< 3.1	< 2.2
Cs-137	< 1.5	< 1.5	< 2.9	< 1.7	< 2.0	< 2.4
Ba-140[a]	< 5.8	< 10.0	< 7.1	< 6.0	< 4.5	< 7.2
La-140[a]	< 1.3	< 2.5	< 1.8	< 1.8	< 2.5	< 2.1
Ce-144	< 27.7	< 39.4	< 25.8	< 13.2	< 24.9	< 20.3

Date Collected	07-26-95	08-30-95	09-27-95	10-25-95	11-29-95	12-27-95
Gross Beta	2.1± 0.6	2.2± 0.6	3.0± 0.6	2.3± 0.6	2.3± 0.4	3.2± 1.3
Be-7	< 20.8	< 21.8	< 25.8	< 21.4	< 7.7	< 28.7
K-40	< 32.0	< 31.6	< 35.9	< 31.6	< 19.4	< 40.9
Mn-54	< 1.5	< 2.1	< 2.2	< 2.0	< 1.0	< 2.5
Fe-59	< 3.8	< 2.4	< 2.7	< 4.9	< 1.5	< 7.3
Co-58	< 1.8	< 2.3	< 3.0	< 2.1	< 0.9	< 1.7
Co-60	< 2.4	< 2.1	< 2.9	< 1.8	< 1.0	< 3.0
Zn-65	< 2.0	< 3.0	< 2.3	< 3.9	< 2.4	< 4.7
Nb-95	< 2.7	< 1.5	< 3.6	< 1.5	< 1.7	< 2.8
Zr-95	< 3.8	< 2.7	< 5.5	< 3.6	< 3.2	< 4.3
Cs-134	< 1.3	< 2.6	< 2.6	< 2.3	< 1.3	< 2.8
Cs-137	< 2.9	< 2.2	< 3.0	< 1.1	< 1.4	< 3.1
Ba-140[a]	< 3.9	< 7.9	< 10.1	< 7.5	< 3.8	< 8.7
La-140[a]	< 0.9	< 1.6	< 2.1	< 2.2	< 1.6	< 6.3
Ce-144	< 19.1	< 22.1	< 22.4	< 22.6	< 17.0	< 43.4

[a]LLD at time of counting.

TABLE E-7

SURFACE WATER GROSS BETA, GROSS ALPHA, I-131
AND GAMMA ISOTOPIC ACTIVITY (pCi/l) - CL-90

Date Collected	01-25-95	02-22-95	03-29-95	04-26-95	05-31-95	06-28-95
Gross Alpha	< 0.7	< 1.5	< 2.1	< 0.7	< 0.9	< 0.6
Gross Beta	1.2± 0.6	3.8± 1.1	3.6± 1.5	1.7± 0.5	1.3± 0.7	2.1± 0.5
Iodine-131	< 0.4	< 0.4	< 0.5	< 0.4	< 0.2	< 0.3
Be-7	< 6.3	< 16.0	< 16.3	< 29.0	< 25.1	< 17.5
K-40	< 24.7	< 29.0	< 33.1	< 37.4	< 33.5	< 32.9
Mn-54	< 1.0	< 1.2	< 2.2	< 2.4	< 1.6	< 1.8
Fe-59	< 2.3	< 3.6	< 3.7	< 4.7	< 4.0	< 3.7
Co-58	< 0.8	< 1.7	< 1.7	< 2.5	< 1.2	< 0.9
Co-60	< 1.4	< 2.0	< 1.4	< 1.8	< 2.8	< 1.8
Zn-65	< 2.3	< 3.3	< 2.6	< 2.5	< 2.7	< 1.9
Nb-95	< 1.3	< 1.9	< 2.3	< 2.4	< 2.3	< 2.2
Zr-95	< 2.2	< 3.6	< 5.4	< 5.9	< 5.3	< 4.0
Cs-134	< 1.3	< 2.1	< 1.8	< 3.4	< 2.5	< 1.9
Cs-137	< 1.5	< 2.6	< 1.2	< 2.6	< 3.0	< 1.4
Ba-140[a]	< 2.3	< 6.8	< 8.1	< 11.4	< 5.5	< 4.6
La-140[a]	< 0.6	< 2.0	< 1.6	< 3.3	< 1.7	< 1.7
Ce-144	< 22.4	< 12.1	< 19.7	< 25.4	< 24.3	< 18.7

Date Collected	07-26-95	08-30-95	09-27-95	10-25-95	11-29-95	12-27-95
Gross Alpha	< 1.1	< 0.9	< 2.0	1.6± 0.9	2.7± 1.2	< 3.0
Gross Beta	2.5± 1.3	2.3± 1.2	< 3.4	4.5± 1.3	5.2± 1.4	< 3.5
Iodine-131	<0.3	<0.3	<0.5	< 0.4	< 0.4	< 0.4
Be-7	< 23.4	< 26.1	< 24.2	< 14.0	< 17.6	< 16.8
K-40	< 38.4	< 42.8	< 40.2	< 42.7	< 36.1	< 30.3
Mn-54	< 2.6	< 2.1	< 2.8	< 1.7	< 1.5	< 1.9
Fe-59	< 5.5	< 4.6	< 4.3	< 4.7	< 3.5	< 1.6
Co-58	< 2.4	< 2.5	< 2.3	< 2.4	< 1.0	< 1.8
Co-60	< 2.3	< 3.1	< 3.0	< 2.3	< 2.2	< 2.2
Zn-65	< 5.0	< 2.6	< 2.7	< 5.5	< 2.1	< 2.1
Nb-95	< 1.8	< 3.4	< 1.8	< 2.5	< 2.2	< 1.9
Zr-95	< 5.6	< 5.7	< 3.3	< 6.2	< 4.5	< 3.8
Cs-134	< 2.2	< 2.2	< 2.2	< 3.4	< 1.2	< 1.3
Cs-137	< 2.4	< 2.0	< 1.5	< 2.0	< 2.1	< 1.8
Ba-140[a]	< 9.6	< 6.2	< 7.7	< 5.1	< 5.1	< 8.1
La-140[a]	< 1.1	< 1.3	< 1.2	< 3.2	< 1.7	< 1.1
Ce-144	< 15.2	< 18.0	< 23.8	< 20.	< 30.4	< 28.5

[a]LLD at time of counting.

TABLE E-8

SURFACE WATER GROSS BETA, GROSS ALPHA, I-131 AND GAMMA ISOTOPIC ACTIVITY (pCi/l) - CL-91

Date Collected	01-25-95	02-22-95	03-29-95	04-26-95	05-31-95	06-28-95
Gross Alpha	0.9± 0.5	< 0.9	< 2.3	<1.0	<1.9	<0.7
Gross Beta	2.0± 0.6	2.5± 0.6	2.0± 1.4	2.5± 0.7	4.0± 2.0	1.9± 0.6
Be-7	< 6.8	< 19.0	< 18.4	< 13.8	< 24.8	< 18.9
K-40	< 24.0	< 35.2	< 46.6	< 21.0	< 34.6	< 40.5
Mn-54	< 1.6	< 1.7	< 2.3	< 1.0	< 2.4	< 2.4
Fe-59	< 3.2	< 3.7	< 2.8	< 3.0	< 4.8	< 5.5
Co-58	< 1.2	< 1.3	< 1.1	< 1.5	< 1.1	< 2.5
Co-60	< 1.6	< 1.8	< 1.9	< 1.2	< 1.7	< 3.4
Zn-65	< 2.5	< 3.8	< 4.6	< 3.7	< 1.8	< 4.0
Nb-95	< 1.2	< 2.2	< 2.2	< 0.7	< 2.4	< 3.0
Zr-95	< 3.5	< 4.6	< 2.5	< 2.4	< 5.1	< 5.4
Cs-134	< 1.5	< 2.6	< 1.6	< 1.1	< 2.2	< 2.8
Cs-137	< 1.6	< 2.0	< 2.6	< 1.3	< 2.5	< 3.2
Ba-140[a]	< 5.5	< 3.7	< 7.9	< 4.6	< 8.4	< 9.1
La-140[a]	< 0.8	< 1.6	< 2.5	< 0.7	< 2.2	< 2.2
Ce-144	< 23.8	< 20.1	< 20.2	< 17.9	< 37.9	< 23.4

Date Collected	07-26-95	08-30-95	09-27-95	10-25-95	11-29-95	12-27-95
Gross Alpha	<1.1	0.7± 0.5	<0.6	<0.7	<0.9	<1.6
Gross Beta	<1.7	1.9± 0.6	2.2± 0.7	2.8± 0.5	2.3± 0.8	2.9± 1.0
Be-7	< 17.8	< 20.9	< 28.0	< 22.6	< 25.1	< 23.3
K-40	< 26.2	< 31.3	< 38.0	< 36.4	< 34.4	< 32.9
Mn-54	< 1.4	< 2.1	< 1.9	< 1.3b	< 1.6	< 2.0
Fe-59	< 3.0	< 4.0	< 5.7	< 2.9b	< 3.6	< 4.7
Co-58	< 1.9	< 1.6	< 2.4	< 2.3	< 1.7	< 1.7
Co-60	< 1.2	< 1.8	< 3.0	< 2.1	< 3.2	< 1.1
Zn-65	< 2.9	< 2.9	< 2.6	< 3.5	< 2.8	< 2.5
Nb-95	< 1.7	< 1.3	< 1.6	< 1.9	< 3.4	< 2.8
Zr-95	< 3.1	< 4.9	< 6.9	< 5.6	< 5.3	< 5.0
Cs-134	< 1.6	< 2.0	< 1.8	< 2.1	< 1.9	< 2.4
Cs-137	< 1.3	< 2.2	< 2.4	< 1.4	< 2.7	< 2.0
Ba-140[a]	< 5.0	< 7.2	< 7.5	< 4.8	< 4.7	< 5.5
La-140[a]	< 1.0	< 1.6	< 1.2	.< 1.2	< 2.8	< 3.0
Ce-144	< 27.3	< 22.0	< 26.1	< 24.7	< 25.9	< 31.6

[a] LLD at time of counting.

TABLE E-9

SURFACE WATER GROSS BETA, TRITIUM, AND GAMMA ISOTOPIC ACTIVITY (pCi/l) - CL-92

Date Collected	01-25-95	02-22-95	03-29-95	04-26-95	05-31-95	06-28-95
Gross Beta	1.9± 0.4	2.7± 0.6	2.8± 0.6	1.3± 0.6	2.3± 0.6	2.1± 0.4
H-3	< 159	< 157	< 173	< 168	< 143	< 165
Be-7	< 8.7	< 11.2	< 10.6	< 21.0	< 13.9	< 22.9
K-40	< 33.5	< 20.4	< 29.6	< 33.4	< 30.9	< 30.5
Mn-54	< 1.5	< 1.0	< 1.4	< 1.8	< 2.0	< 2.1
Fe-59	< 3.2	< 2.5	< 1.7	< 2.0	< 4.7	< 1.9
Co-58	< 0.9	< 1.1	< 1.5	< 1.7	< 1.7	< 1.9
Co-60	< 1.4	< 1.0	< 1.5	< 2.1	< 2.4	< 2.6
Zn-65	< 1.4	< 4.0	< 3.5	< 2.0	< 3.7	< 3.8
Nb-95	< 1.3	< 1.6	< 1.3	< 2.4	< 2.0	< 2.6
Zr-95	< 3.6	< 1.6	< 3.6	< 5.3	< 3.5	< 5.9
Cs-134	< 1.4	< 1.4	< 2.0	< 1.9	< 2.4	< 1.2
Cs-137	< 1.4	< 1.4	< 1.7	< 1.4	< 1.9	< 2.1
Ba-140[a]	< 3.3	< 5.5	< 6.0	< 8.9	< 7.7	< 5.3
La-140[a]	< 1.6	< 1.3	< 1.8	< 1.1	< 2.2	< 1.9
Ce-144	< 11.8	< 23.9	< 11.2	< 29.5	< 21.9	< 11.4

Date Collected	07-26-95	08-30-95	09-27-95	10-25-95	11-29-95	12-27-95
Gross Beta	2.7± 0.8	1.8± 0.6	2.6± 0.6	2.5± 0.6	-	-
H-3	< 169	< 156	< 153	< 149	-	-
Be-7	< 10.2	< 10.5	< 18.4	< 28.0	-	-
K-40	< 25.2	< 34.0	< 33.6	< 33.0	-	-
Mn-54	< 1.9	< 2.0	< 1.9	< 1.2	-	-
Fe-59	< 3.7	< 3.6	< 4.0	< 3.3	-	-
Co-58	< 2.3	< 1.2	< 2.5	< 2.5	-	-
Co-60	< 1.6	< 2.0	< 2.3	< 2.0	-	-
Zn-65	< 2.8	< 3.1	< 3.6	< 2.5	-	-
Nb-95	< 1.4	< 2.1	< 2.7	< 2.7	-	-
Zr-95	< 2.7	< 4.3	< 4.5	< 5.6	-	-
Cs-134	< 1.7	< 2.1	< 2.6	< 1.9	-	-
Cs-137	< 2.3	< 1.8	< 2.5	< 1.9	-	-
Ba-140[a]	< 3.6	< 7.7	< 4.5	< 5.0	-	-
La-140[a]	< 1.6	< 1.0	< 1.8	< 1.7	-	-
Ce-144	< 27.4	< 17.6	< 24.5	< 21.0	-	-

[a] LLD at time of counting.

TABLE E-10

SURFACE WATER GROSS BETA, TRITIUM, AND GAMMA ISOTOPIC ACTIVITY (pCi/l) - CL-99

Date Collected	01-25-95	02-22-95	03-29-95	04-26-95	05-31-95	06-28-95
Gross Alpha	< 0.8	< 0.9	< 2.2	<1.1	<1.5	< 0.9
Gross Beta	1.8± 0.6	2.5± 0.7	2.5± 1.5	2.2± 0.8	1.7± 1.3	1.7± 0.8
Be-7	< 29.2	< 6.4	< 22.5	< 13.7	< 23.3	< 28.7
K-40	< 43.2	< 19.8	< 33.5	< 32.0	< 40.3	< 41.6
Mn-54	< 2.8	< 0.9	< 1.1	< 2.1	< 2.5	< 2.3
Fe-59	< 5.9	< 2.0	< 4.2	< 4.2	< 5.7	< 6.4
Co-58	< 1.9	< 1.2	< 1.0	< 1.9	< 2.2	< 1.6
Co-60	< 2.2	< 1.4	< 2.2	< 2.0	< 2.1	< 2.5
Zn-65	< 5.8	< 3.4	< 1.6	< 3.4	< 5.0	< 6.1
Nb-95	< 3.1	< 1.4	< 1.9	< 2.2	< 2.0	< 2.7
Zr-95	< 3.0	< 3.2	< 2.5	< 2.3	< 6.8	< 5.4
Cs-134	< 2.1	< 1.0	< 2.0	< 1.8	< 3.3	< 2.9
Cs-137	< 2.9	< 1.5	< 1.8	< 2.0	< 3.1	< 3.1
Ba-140[a]	< 9.9	< 3.0	< 8.0	< 8.2	< 10.4	< 8.9
La-140[a]	< 2.5	< 0.6	< 1.9	< 0.9	< 2.5	< 2.1
Ce-144	< 26.3	< 23.1	< 34.5	< 36.5	< 43.2	< 20.5

Date Collected	07-26-95	08-30-95	09-27-95	10-25-95	11-29-95	12-27-95
Gross Alpha	4.2± 1.0	1.1± 0.7	< 1.1	1.7± 1.1	< 1.4	< 2.1
Gross Beta	4.4± 0.9	2.4± 0.8	2.4± 0.9	2.8± 0.9	3.1± 1.0	< 2.4
Be-7	< 30.3	< 23.4	< 25.3	< 34.0	< 16.1	< 28.3
K-40	< 41.2	< 36.8	< 40.1	< 35.5	< 37.7	< 41.6
Mn-54	< 2.8	< 1.6	< 1.9	< 1.6	< 2.1	< 2.5
Fe-59	< 6.8	< 2.5	< 4.5	< 5.5	< 5.2	< 5.5
Co-58	< 1.4	< 2.9	< 2.8	< 2.9	< 2.0	< 1.4
Co-60	< 2.3	< 2.7	< 3.0	< 3.3	< 2.1	< 2.8
Zn-65	< 4.4	< 3.7	< 4.6	< 5.0	< 2.4	< 6.1
Nb-95	< 1.6	< 2.7	< 2.9	< 3.5	< 2.8	< 3.8
Zr-95	< 5.8	< 5.5	< 6.6	< 7.7	< 3.7	< 4.8
Cs-134	< 3.2	< 2.9	< 2.3	< 2.5	< 1.3	< 3.3
Cs-137	< 3.3	< 2.8	< 2.0	< 2.9	< 2.3	< 2.4
Ba-140[a]	< 9.4	< 9.8	< 11.1	< 10.9	< 8.0	< 8.4
La-140[a]	< 1.9	< 2.7	< 2.3	< 1.9	< 0.9	< 6.9
Ce-144	< 22.9	< 20.2	< 22.8	< 21.0	< 33.8	< 23.5

[a] LLD at time of counting.

TABLE E-12

SURFACE WATER QUARTERLY TRITIUM COMPOSITE
(pCi/l)

1995	CL-9	CL-10[a]	CL-13	CL-90	CL-91	CL-99
1st Quarter	<173	<173	<173	<173	<173	<173
2nd Quarter	<164	<164	<164	<164	<164	<164
3rd Quarter	<153	<153	<153	<153	<153	<153
4th Quarter	<157	<157	<157	<157	<157	<157

a control location

TABLE E-13

WELL- WATER QUARTERLY TRITIUM COMPOSITE
(pCi/l)

1995	CL-7D	CL-12 (Untreated)	CL-12 (Treated)
1st Quarter	<173	<173	<173
2nd Quarter	<164	<164	<164
3rd Quarter	<153	<153	<153
4th Quarter	<157	<157	<157

TABLE E-14

DRINKING WATER QUARTERLY TRITIUM COMPOSITE
(pCi/l)

1995	
1st Quarter	<173
2nd Quarter	<164
3rd Quarter	<153
4th Quarter	<157

TABLE E-15

WELL WATER SEMIMONTHLY IODINE ACTIVITY
(pCi/l)

Date	CL-7D	CL-12 Untreated	CL-12 Treated
01/11/95	<0.4	<0.3	<0.5
01/25/95	<0.4	<0.4	<0.4
02/08/95	<0.2	<0.2	<0.2
02/22/95	<0.4	<0.3	<0.3
03/08/95	<0.4	<0.4	<0.5
03/22/95	<0.4	<0.4	<0.4
04/05/95	<0.5	<0.4	<0.5
04/19/95	<0.2	<0.2	<0.2
05/03/95	<0.3	<0.2	<0.2
05/17/95	<0.2	<0.2	<0.2
05/31/95	<0.2	<0.2	<0.2
06/14/95	<0.2	<0.2	<0.2
06/28/95	<0.3	<0.3	<0.3
07/12/95	<0.4	<0.3	<0.4
07/26/95	<0.3	<0.3	<0.3
08/09/95	<0.5	<0.5	<0.5
08/23/95	<0.3	<0.3	<0.3
09/06/95	<0.4	<0.4	<0.4
09/20/95	<0.2	<0.2	<0.2
10/04/95	<0.3	<0.3	<0.3
10/18/95	<0.4	<0.5	<0.5
11/01/95	<0.4	<0.4	<0.5
11/15/95	<0.4	<0.4	<0.4
11/29/95	<0.4	<0.4	<0.4
12/13/95	<0.4	<0.5	<0.2
12/27/95	<0.3	<0.4	<0.4

TABLE E-16

WELL WATER MONTHLY COMPOSITE ACTIVITY
CL-7D (pCi/l)

Collection Period	January	February	March	April	May	June
Gross Alpha	< 1.4	< 0.7	< 1.8	<1.1	< 1.6	< 1.0
Gross Beta	1.5± 0.7	1.4± 0.6	< 1.8	<1.4	< 2.3	< 1.2
Be-7	< 23.9	< 12.5	< 16.4	< 14.1	< 7.6	<12.9
K-40	< 41.5	< 21.1	< 32.7	< 37.0	< 23.9	<34.3
Mn-54	< 1.9	< 1.0	< 2.2	< 2.6	< 0.7	<2.3
Fe-59	< 3.9	< 3.0	< 2.0	< 6.3	< 2.4	<2.0
Co-58	< 1.6	< 1.3	< 1.9	< 2.6	< 1.3	<1.9
Co-60	< 1.8	< 1.4	< 0.8	< 2.0	< 1.2	<1.5
Zn-65	< 2.7	< 1.3	< 3.5	< 6.3	< 3.6	<3.5
Nb-95	< 3.9	< 1.8	< 2.5	< 2.6	< 1.1	<2.7
Zr-95	< 5.5	< 2.3	< 4.6	< 6.8	< 2.7	<5.2
Cs-134	< 2.4	< 1.3	< 1.1	< 2.9	< 1.8	<1.3
Cs-137	< 1.9	< 1.4	< 1.1	< 2.8	< 1.6	<2.5
Ba-140[a]	< 6.6	< 4.1	< 7.3	< 9.5	< 5.7	<7.4
La-140[a]	< 2.5	< 1.4	< 2.1	< 1.9	< 1.4	<1.2
Ce-144	< 17.4	< 19.7	< 19.8	< 18.1	< 26.2	<31.6

Collection Period	July	August	September	October	November	December
Gross Alpha	1.4± 0.7	< 0.7	<1.0	< 1.2	< 1.4	1.3± 0.8
Gross Beta	1.2± 0.7	< 1.2	<1.2	< 1.3	1.5± 0.9	1.6± 0.8
Be-7	< 15.2	< 9.9	< 20.3	< 25.0	< 11.1	<22.5
K-40	< 34.4	< 20.5	< 20.0	< 35.2	< 28.2	<23.9
Mn-54	< 2.2	< 0.8	< 1.2	< 2.0	< 1.6	<2.0
Fe-59	< 3.4	< 2.9	< 2.7	< 4.7	< 4.4	<5.1
Co-58	< 1.8	< 1.4	< 1.2	< 1.4	< 2.1	<2.0
Co-60	< 2.6	< 1.1	< 1.5	< 1.6	< 2.1	<1.8
Zn-65	< 3.9	< 1.3	< 4.1	< 5.8	< 2.8	<3.5
Nb-95	< 2.8	< 1.6	< 1.2	< 1.6	< 2.3	<2.7
Zr-95	< 6.1	< 1.7	< 2.0	< 4.9	< 3.5	<3.6
Cs-134	< 1.2	< 1.4	< 1.6	< 2.5	< 2.3	<2.2
Cs-137	< 1.3	< 1.6	< 1.1	< 2.2	< 1.9	<2.2
Ba-140[a]	< 7.7	< 5.3	< 4.9	< 5.5	< 7.3	<8.3
La-140[a]	< 1.3	< 0.9	< 1.3	< 1.7	< 1.8	<4.8
Ce-144	< 20.6	< 16.9	< 17.0	< 33.6	< 29.5	<13.4

[a] LLD at time of counting

TABLE E-17

WELL WATER MONTHLY COMPOSITE ACTIVITY
CL-12 UNTREATED (pCi/l)

Collection Period	January	February	March	April	May	June
Gross Alpha	< 3.0	< 1.7	< 4.0	< 2.4	< 1.9	< 2.4
Gross Beta	< 2.5	2.6± 1.2	< 3.6	4.± 1.9	< 2.6	< 2.3
Be-7	< 17.5	< 18.8	< 18.3	< 25.3	<13.0	<22.3
K-40	< 34.1	< 32.6	< 33.6	< 35.2	<24.7	<32.2
Mn-54	< 2.4	< 1.8	< 1.8	< 2.4	< 1.4	<2.2
Fe-59	< 3.0	< 5.4	< 3.5	< 3.8	< 1.5	<2.3
Co-58	< 1.4	< 2.2	< 2.1	< 2.3	< 1.3	<1.2
Co-60	< 2.2	< 1.5	< 1.6	< 3.0	< 1.7	<2.5
Zn-65	< 2.2	< 4.2	< 3.4	< 4.9	< 2.7	<3.6
Nb-95	< 2.6	< 2.9	< 2.4	< 3.4	< 1.6	<2.8
Zr-95	< 5.6	< 5.0	< 2.6	< 7.2	< 3.6	<6.3
Cs-134	< 1.4	< 2.2	< 1.9	< 2.6	< 1.8	<2.6
Cs-137	< 2.1	< 1.8	< 2.2	< 2.9	< 1.8	<2.5
Ba-140[a]	< 3.7	< 6.2	< 5.2	< 4.4	< 5.3	<6.0
La-140[a]	< 1.2	< 1.6	< 1.0	< 2.6	< 1.4	<0.9
Ce-144	< 16.0	< 11.4	< 21.5	< 34.8	<25.6	<22.0

Collection Period	July	August	September	October	November	December
Gross Alpha	<2.1	< 1.7	<1.9	< 2.0	< 3.2	< 2.9
Gross Beta	<2.4	< 2.3	<2.3	2.7± 1.6	< 3.0	< 2.4
Be-7	< 8.9	< 23.5	< 19	< 20.3	<31.2	<28.2
K-40	< 20.4	< 30.5	< 30.1	< 32.8	<24.7	<40.7
Mn-54	< 1.0	< 2.0	< 2.3	< 1.2	< 2.8	<1.9
Fe-59	< 2.8	< 5.1	< 2.0	< 5.1	< 5.5	<5.3
Co-58	< 1.5	< 2.0	< 1.6	< 1.1	< 2.4	<2.3
Co-60	< 1.5	< 2.6	< 2.1	< 2.0	< 3.4	<3.1
Zn-65	< 2.1	< 3.8	< 2.5	< 3.6	< 5.9	<4.5
Nb-95	< 0.8	< 2.7	< 2.1	< 2.7	< 4.1	<3.4
Zr-95	< 2.9	< 3.9	< 3.5	< 4.8	< 7.1	<5.5
Cs-134	< 1.4	< 2.6	< 2.3	< 1.1	< 2.8	<3.1
Cs-137	< 1.1	< 2.7	< 2.0	< 1.7	< 2.4	<2.8
Ba-140[a]	< 4.7	< 7.9	< 7.5	< 7.6	< 5.6	<8.7
La-140[a]	< 1.0	< 2.3	< 2.6	< 1.5	< 1.0	<6.0
Ce-144	< 9.9	< 23.1	< 24.9	< 13.3	<17.3	<21.1

[a] LLD at time of counting.

TABLE E-18

WELL WATER MONTHLY COMPOSITE ACTIVITY
CL-12 TREATED (pCi/l)

Collection Period	January	February	March	April	May	June
Gross Alpha	< 3.1	< 1.7	< 3.8	<2.8	< 2.0	< 2.2
Gross Beta	< 2.6	2.5± 1.2	< 3.4	2.2± 1.2	< 2.5	< 2.4
Be-7	< 20.6	< 11.8	< 17.4	< 14.2	<17.5	<14.3
K-40	< 31.2	< 31.7	< 40.1	< 39.5	<32.7	<45.7
Mn-54	< 1.8	< 2.0	< 2.3	< 2.4	< 1.0	<2.7
Fe-59	< 5.3	< 3.9	< 4.6	< 4.7	< 3.2	<2.9
Co-58	< 2.4	< 2.3	< 2.3	< 2.0	< 2.1	<2.1
Co-60	< 1.7	< 2.2	< 2.4	< 1.2	< 2.2	<2.7
Zn-65	< 3.1	< 3.9	< 4.2	< 3.8	< 4.5	<2.5
Nb-95	< 1.3	< 2.4	< 2.5	< 2.6	< 1.7	<3.3
Zr-95	< 6.2	< 5.1	< 2.7	< 3.1	< 4.2	<6.6
Cs-134	< 1.9	< 2.6	< 3.1	< 2.2	< 1.2	<1.7
Cs-137	< 2.3	< 1.7	< 2.7	< 1.8	< 1.8	<1.9
Ba-140[a]	< 5.3	< 5.2	< 8.9	< 4.5	< 7.5	<7.0
La-140[a]	< 1.3	< 2.0	< 1.2	< 1.0	< 1.5	<3.3
Ce-144	< 32.3	< 32.7	< 16.1	< 14.5	<27.8	<43.2

Collection Period	July	August	September	October	November	December
Gross Alpha	<2.4	< 1.9	<2.2	< 2.5	< 3.2	2.3± 1.7
Gross Beta	<2.4	< 2.2	<2.4	< 2.4	< 3.0	4.1± 1.6
Be-7	< 20.0	< 15.3	< 23.3	< 13.9	< 8.9	<21.4
K-40	< 33.0	< 45.5	< 42.0	< 35.6	<19.8	<29.2
Mn-54	< 2.1	< 3.4	< 2.6	< 2.1	< 1.2	<1.9
Fe-59	< 5.2	< 2.7	< 5.2	< 7.6	< 1.9	<4.4
Co-58	< 2.0	< 2.2	< 2.1	< 3.3	< 1.0	<2.2
Co-60	< 1.9	< 2.4	< 2.1	< 2.3	< 1.1	<2.1
Zn-65	< 3.5	< 2.3	< 5.3	< 4.5	< 4.0	<3.0
Nb-95	< 2.0	< 2.8	< 2.7	< 1.9	< 1.3	<3.2
Zr-95	< 3.5	< 5.9	< 2.9	< 3.7	< 3.0	<6.2
Cs-134	< 1.6	< 1.8	< 1.5	< 2.4	< 1.4	<1.2
Cs-137	< 1.8	< 2.6	< 2.9	< 1.3	< 1.3	<1.4
Ba-140[a]	< 6.2	< 8.9	< 5.4	< 8.5	< 4.0	<8.7
La-140[a]	< 2.1	< 1.3	< 2.6	< 2.4	< 0.5	<4.3
Ce-144	< 30.0	< 22.6	< 41.8	< 14.3	<18.0	<39.1

[a] LLD at time of counting.

TABLE E-19

DRINKING WATER ACTIVITY - CL-14 (pCi/l)

Date Collected	01-25-95	02-22-95	03-29-95	04-26-95	05-31-95	06-28-95
Gross Alpha	< 0.4	< 0.3	< 1.3	<0.4	< 0.7	< 0.4
Gross Beta	1.9± 0.3	1.9± 0.3	< 2.3	1.8± 0.4	1.5± 0.5	2.0± 0.3
Be-7	< 9.0	< 21.7	< 15.7	< 23.0	< 18.1	< 10.5
K-40	< 35.0	< 39.9	< 35.0	< 44.0	< 32.5	< 29.0
Mn-54	< 1.3	< 2.5	< 2.0	< 2.2	< 1.8	< 1.5
Fe-59	< 1.7	< 6.2	< 3.1	< 4.1	< 3.9	< 3.1
Co-58	< 1.6	< 1.2	< 1.6	< 2.6	< 2.2	< 2.0
Co-60	< 1.7	< 2.6	< 2.0	< 3.0	< 2.1	< 2.0
Zn-65	< 2.7	< 2.3	< 2.3	< 3.0	< 5.4	< 2.3
Nb-95	< 1.9	< 3.2	< 1.3	< 1.7	< 2.5	< 1.0
Zr-95	< 2.0	< 5.2	< 4.8	< 6.0	< 4.4	< 3.6
Cs-134	< 1.9	< 1.9	< 2.4	< 3.1	< 2.3	< 1.2
Cs-137	< 2.0	< 2.6	< 2.3	< 2.3	< 1.9	< 2.2
Ba-140[a]	< 4.4	< 9.0	< 5.5	< 5.6	< 3.8	< 6.0
La-140[a]	< 0.8	< 1.9	< 2.1	< 3.2	< 2.1	< 2.2
Ce-144	< 23.3	< 43.3	< 18.3	< 19.3	< 23.6	< 28.8

Date Collected	07-26-95	08-30-95	09-27-95	10-25-95	11-29-95	12-27-95
Gross Alpha	<0.3	< 0.4	< 0.8	0.6± 0.3	<0.5	<0.3
Gross Beta	1.2± 0.3	2.0± 0.3	1.8± 0.6	2.3± 0.3	2.3± 0.4	1.8± 0.3
Be-7	< 20.6	< 19.3	< 29.2	< 12.2	< 27.4	< 14.4
K-40	< 33.4	< 32.7	< 37.0	< 19.6	< 31.9	< 31.7
Mn-54	< 1.3	< 0.	< 2.2	< 1.2	< 1.9	< 2.0
Fe-59	< 4.1	< 4.1	< 3.5	< 2.8	< 2.6	< 5.5
Co-58	< 2.6	< 1.5	< 2.9	< 1.4	< 2.8	< 2.0
Co-60	< 2.2	< 1.9	< 2.7	< 1.2	< 1.9	< 2.4
Zn-65	< 4.0	< 4.0	< 5.6	< 4.0	< 4.5	< 4.1
Nb-95	< 3.1	< 1.9	< 3.0	< 1.5	< 2.8	< 2.5
Zr-95	< 2.8	< 5.7	< 5.8	< 2.2	< 3.5	< 2.7
Cs-134	< 1.9	< 2.0	< 2.8	< 1.0	< 2.3	< 2.7
Cs-137	< 1.6	< 2.1	< 2.6	< 1.3	< 2.1	< 2.2
Ba-140[a]	< 5.3	< 6.1	< 5.8	< 4.3	< 7.4	< 9.3
La-140[a]	< 1.1	< 2.2	< 1.5	< 1.5	< 1.2	< 5.0
Ce-144	< 19.9	< 20.0	< 13.0	< 16.6	< 14.2	< 17.0

[a] LLD at time of counting.

TABLE E-20

MILK ACTIVITY - CL-98 (pCi/l)

Date Collected	01-25-95	02-22-95	03-29-95	04-26-95	05-10-95
Sr-90	1.9± 0.4	NS[b]	NS[b]	NS[b]	1.5± 0.6
I-131	< 0.4	-	-	-	< 0.4
Be-7	< 16.3	-	-	-	< 21.5
K-40	1950± 80	-	-	-	1400± 60
Mn-54	< 2.5	-	-	-	< 2.5
Fe-59	< 3.7	-	-	-	< 5.3
Co-58	< 3.4	-	-	-	< 1.5
Co-60	< 5.0	-	-	-	< 3.5
Zn-65	< 7.8	-	-	-	< 4.9
Nb-95	< 3.7	-	-	-	< 3.0
Zr-95	< 5.7	-	-	-	< 5.1
Cs-134	< 4.0	-	-	-	< 2.8
Cs-137	< 3.5	-	-	-	< 2.6
Ba-140[a]	< 10.7	-	-	-	< 4.3
La-140[a]	< 1.2	-	-	-	< 1.1
Ce-144	< 18.1	-	-	-	< 37.5

Date Collected	05-24-95	06-07-95	06-21-95	07-05-95	07-19-95
Sr-90	1.4± 0.4	1.3± 0.3	1.7± 0.4	1.5± 0.3	2.0± 0.5
I-131	< 0.2	< 0.4	< 0.3	< 0.4	< 0.2
Be-7	< 15.5	< 24.0	< 19.6	< 17.5	< 25.5
K-40	1510± 60	1990± 80	1890± 70	1880± 80	2150± 90
Mn-54	< 2.3	< 3.1	< 1.4	< 3.0	< 3.4
Fe-59	< 5.2	< 7.1	< 4.3	< 4.0	< 8.1
Co-58	< 2.2	< 2.8	< 1.6	< 2.6	< 3.0
Co-60	< 3.3	< 3.5	< 3.5	< 3.9	< 3.6
Zn-65	< 4.1	< 3.7	< 6.1	< 4.7	< 9.6
Nb-95	< 2.2	< 2.0	< 2.6	< 2.5	< 2.9
Zr-95	< 3.0	< 5.4	< 5.4	< 5.2	< 6.7
Cs-134	< 2.8	< 1.5	< 2.3	< 1.7	< 2.0
Cs-137	< 2.8	< 2.4	< 2.7	< 1.8	< 3.3
Ba-140[a]	< 8.8	< 6.5	< 4.3	< 8.3	< 10.3
La-140[a]	< 2.5	< 1.3	< 2.1	< 1.4	< 2.2
Ce-144	< 19.3	< 18.7	< 21.0	< 17.6	< 24.0

[a] LLD at time of counting.

[b] NS = No sample; sample not available.

TABLE E-20 (Cont'd)

Date Collected	08-02-95	08-16-95	08-30-95	09-13-95	09-27-95
Sr-90	1.3± 0.4	1.2± 0.3	1.2± 0.6	0.9± 0.3	2.4± 0.5
I-131	< 0.2	< 0.2	< 0.4	< 0.4	< 0.3
Be-7	< 24.1	< 22.0	< 12.0	< 13.8	< 16.5
K-40	2090± 80	2120± 80	1950± 70	1990± 90	2030± 90
Mn-54	< 3.2	< 3.1	< 2.5	< 2.7	< 2.9
Fe-59	< 4.0	< 7.3	< 6.3	< 4.8	< 6.7
Co-58	< 2.7	< 1.7	< 1.1	< 2.7	< 3.3
Co-60	< 4.2	< 4.6	< 3.2	< 2.8	< 2.1
Zn-65	< 7.9	< 8.8	< 7.0	< 4.5	< 6.5
Nb-95	< 3.1	< 3.1	< 2.3	< 2.7	< 3.1
Zr-95	< 7.8	< 7.3	< 5.1	< 5.3	< 8.1
Cs-134	< 3.6	< 2.3	< 3.1	< 3.9	< 3.9
Cs-137	< 2.9	< 3.7	< 2.7	< 3.8	< 3.6
Ba-140[a]	< 7.1	< 11.8	< 7.6	< 10.1	< 8.5
La-140[a]	< 1.6	< 1.2	< 1.3	< 3.3	< 1.4
Ce-144	< 27.3	< 23.3	< 28.2	< 48.3	< 30.9

Date Collected	10-11-95	10-25-95	11-29-95	12-27-95
Sr-90	1.4± 0.4	1.3± 0.4	1.4± 0.5	1.8± 0.4
I-131	< 0.4	< 0.4	< 0.5	<0.6
Be-7	< 30.3	< 21.5	< 20.2	< 32.3
K-40	1920± 100	2010± 80	2140± 90	2160± 90
Mn-54	< 1.8	< 1.2	< 2.7	< 2.5
Fe-59	< 7.5	< 5.1	< 3.3	< 7.4
Co-58	< 3.4	< 2.7	< 2.8	< 2.5
Co-60	< 5.4	< 3.8	< 5.2	< 4.9
Zn-65	< 5.2	< 5.6	< 9.0	< 5.5
Nb-95	< 3.3	< 2.7	< 3.0	< 2.1
Zr-95	< 7.9	< 3.8	< 7.9	< 3.5
Cs-134	< 4.3	< 1.3	< 2.3	< 3.9
Cs-137	< 4.0	< 2.6	< 4.0	< 3.8
Ba-140[a]	< 11.9	< 8.1	< 11.5	< 11.4
La-140[a]	< 1.2	< 1.0	< 2.7	< 2.9
Ce-144	< 38.6	< 32.7	< 22.9	< 30.1

[a] LLD at time of counting.

TABLE E-21

MILK ACTIVITY - CL-116 (control)(pCi/l)

Date Collected	01-25-95	02-22-95	03-29-95	04-26-95	05-10-95
Sr-90	1.0± 0.3	1.0± 0.4	1.7± 0.4	1.6± 0.5	1.7± 0.3
I-131	< 0.4	< 0.3	< 0.4	< 0.2	< 0.3
Be-7	< 22.6	< 20.1	< 19.5	< 12.7	< 19.1
K-40	1340± 60	1110± 70	1300± 50	1370± 60	1380± 50
Mn-54	< 1.6	< 3.0	< 1.6	< 2.0	< 2.1
Fe-59	< 3.9	< 5.9	< 4.3	< 5.6	< 3.9
Co-58	< 1.7	< 3.1	< 1.6	< 1.5	< 2.1
Co-60	< 1.7	< 2.7	< 2.7	< 3.3	< 3.4
Zn-65	< 3.1	< 6.7	< 4.5	< 5.5	< 2.8
Nb-95	< 1.1	< 3.2	< 1.4	< 2.4	< 3.0
Zr-95	< 4.4	< 5.3	< 4.2	< 4.6	< 4.4
Cs-134	< 1.7	< 3.3	< 2.1	< 2.7	< 2.3
Cs-137	< 2.6	< 3.1	< 2.6	< 2.4	< 2.8
Ba-140[a]	< 6.0	< 7.4	< 8.3	< 9.6	< 8.0
La-140[a]	< 1.8	< 2.0	< 1.4	< 1.9	< 1.0
Ce-144	< 20.2	< 17.7	< 23.4	< 25.0	< 17.0

Date Collected	05-24-95	06-07-95	06-21-95	07-05-95	07-19-95
Sr-90	1.9± 0.4	2.2± 0.6	0.9± 0.3	1.3± 0.4	1.9± 0.5
I-131	< 0.3	< 0.4	< 0.3	< 0.3	< 0.2
Be-7	< 26.0	< 25.6	< 25.4	< 18.2	< 19.7
K-40	1360± 70	1410± 60	1340± 80	1370± 70	1310± 60
Mn-54	< 2.7	< 2.0	< 2.6	< 1.3	< 2.6
Fe-59	< 5.9	< 3.1	< 6.5	< 6.2	< 2.4
Co-58	< 3.0	< 2.7	< 1.7	< 2.0	< 2.1
Co-60	< 2.9	< 3.2	< 4.1	< 3.1	< 3.0
Zn-65	< 6.2	< 3.7	< 5.0	< 5.9	< 5.4
Nb-95	< 1.4	< 2.6	< 3.0	< 1.1	< 2.6
Zr-95	< 5.6	< 6.4	< 7.2	< 2.6	< 4.0
Cs-134	< 3.2	< 2.8	< 3.6	< 2.4	< 2.8
Cs-137	< 2.7	< 1.3	< 3.6	< 2.0	< 2.0
Ba-140[a]	< 10.5	< 9.8	< 8.8	< 4.9	< 8.0
La-140[a]	< 2.0	< 2.0	< 1.9	< 1.7	< 2.5
Ce-144	< 21.3	< 36.6	< 17.3	< 29.6	< 20.3

[a]LLD at time of counting.

TABLE E-21 (Cont'd)

Date Collected	08-02-95	08-16-95	08-30-95	09-13-95	09-27-95
Sr-90	1.4± 0.4	1.5± 0.3	1.1± 0.3	1.3± 0.4	1.5± 0.4
I-131	< 0.2	< 0.4	< 0.3	< 0.4	< 0.3
Be-7	< 10.6	< 17.9	< 14.7	< 10.8	< 19.1
K-40	1330± 60	1310± 60	1380± 50	1380± 70	1340± 60
Mn-54	< 2.6	< 2.2	< 1.7	< 1.7	< 1.2
Fe-59	< 5.9	< 4.6	< 3.2	< 3.0	< 4.9
Co-58	< 2.6	< 1.8	< 1.7	< 1.3	< 2.5
Co-60	< 3.2	< 3.2	< 1.7	< 2.6	< 2.8
Zn-65	< 2.6	< 4.7	< 3.1	< 4.3	< 2.9
Nb-95	< 2.6	< 1.6	< 1.8	< 2.1	< 2.2
Zr-95	< 5.2	< 2.9	< 4.0	< 3.9	< 5.5
Cs-134	< 3.0	< 2.4	< 1.5	< 3.1	< 1.7
Cs-137	< 2.1	< 2.3	< 2.0	< 2.5	< 2.5
Ba-140[a]	< 9.1	< 9.6	< 6.4	< 6.2	< 9.1
La-140[a]	< 1.8	< 1.5	< 1.2	< 1.4	< 1.2
Ce-144	< 37.9	< 15.0	< 26.4	< 19.4	< 33.7

Date Collected	10-11-95	10-25-95	11-29-95	12-27-95
Sr-90	1.9± 0.4	1.6± 0.4	2.2± 0.5	1.0± 0.3
I-131	< 0.4	< 0.4	< 0.4	< 0.3
Be-7	< 31.9	< 12.6	< 23.7	< 19.9
K-40	1400± 80	1390± 50	1420± 70	1360± 70
Mn-54	< 2.7	< 1.2	< 2.8	< 3.0
Fe-59	< 6.2	< 2.9	< 5.6	< 3.0
Co-58	< 1.9	< 1.5	< 2.7	< 2.7
Co-60	< 3.9	< 2.2	< 3.2	< 3.1
Zn-65	< 3.7	< 3.2	< 3.6	< 7.6
Nb-95	< 3.7	< 1.7	< 1.2	< 2.2
Zr-95	< 3.8	< 1.6	< 5.6	< 6.9
Cs-134	< 2.6	< 1.7	< 2.2	< 1.8
Cs-137	< 3.3	< 1.9	< 2.7	< 3.6
Ba-140[a]	< 12.5	< 6.5	< 8.6	< 10.2
La-140[a]	< 3.2	< 0.7	< 1.9	< 2.8
Ce-144	< 26.2	< 18.2	< 18.7	< 21.2

[a]LLD at time of counting.

TABLE E-22

GRASS ACTIVITY - CL-1 (pCi/g wet)

Date Collected	01-25-95	02-22-95	03-29-95	04-26-95	05-10-95
Be-7	11.47± 0.28	6.96 ± 0.20	10.26± 0.23	2.58 ± 0.11	1.10 ± 0.06
K-40	2.99 ± 0.25	2.74 ± 0.22	2.61 ± 0.22	6.28 ± 0.18	4.84 ± 0.12
Mn-54	< 0.009	< 0.008	< 0.013	< 0.007	< 0.005
Fe-59	< 0.012	< 0.021	< 0.023	< 0.013	< 0.005
Co-58	< 0.012	< 0.010	< 0.013	< 0.008	< 0.004
Co-60	< 0.015	< 0.006	< 0.015	< 0.008	< 0.006
Zn-65	< 0.024	< 0.017	< 0.013	< 0.023	< 0.005
Nb-95	< 0.012	< 0.011	< 0.006	< 0.006	< 0.005
Zr-95	< 0.013	< 0.018	< 0.025	< 0.013	< 0.006
I-131	< 0.009	< 0.012	< 0.018	< 0.007	< 0.007
Cs-134	< 0.014	< 0.011	< 0.015	< 0.008	< 0.006
Cs-137	< 0.013	< 0.012	< 0.013	< 0.008	< 0.006
Ba-140[a]	< 0.038	< 0.033	< 0.027	< 0.024	< 0.015
La-140[a]	< 0.005	< 0.006	< 0.012	< 0.003	< 0.002
Ce-144	< 0.10	< 0.089	< 0.066	< 0.085	< 0.029

Date Collected	05-24-95	06-07-95	06-21-95	07-05-95	07-19-95
Be-7	1.09± 0.07	2.15± 0.09	1.60± 0.07	2.72± 0.12	1.27± 0.11
K-40	3.08± 0.14	4.49± 0.14	3.38± 0.13	4.33± 0.20	6.34± 0.27
Mn-54	< 0.004	< 0.005	< 0.005	< 0.007	< 0.007
Fe-59	< 0.005	< 0.012	< 0.005	< 0.009	< 0.025
Co-58	< 0.005	< 0.005	< 0.003	< 0.004	< 0.005
Co-60	< 0.007	< 0.007	< 0.008	< 0.009	< 0.011
Zn-65	< 0.011	< 0.014	< 0.013	< 0.011	< 0.025
Nb-95	< 0.004	< 0.005	< 0.006	< 0.004	< 0.011
Zr-95	< 0.006	< 0.006	< 0.011	< 0.017	< 0.014
I-131	< 0.007	< 0.005	< 0.006	< 0.010	< 0.010
Cs-134	< 0.005	< 0.007	< 0.004	< 0.006	< 0.010
Cs-137	< 0.006	< 0.005	< 0.007	< 0.007	< 0.010
Ba-140[a]	< 0.011	< 0.019	< 0.009	< 0.030	< 0.035
La-140[a]	< 0.004	< 0.005	< 0.003	< 0.006	< 0.003
Ce-144	< 0.032	< 0.084	< 0.034	< 0.054	< 0.066

[a]LLD at time of counting.

TABLE E-22 (Cont'd)

Date Collected	08-02-95	08-16-95	08-30-95	09-13-95	09-27-95
Be-7	2.00± 0.09	2.21± 0.10	3.14± 0.18	3.25± 0.12	3.51± 0.13
K-40	5.34± 0.18	8.96± 0.22	5.37± 0.30	4.99± 0.19	5.64± 0.22
Mn-54	< 0.006	< 0.005	< 0.010	< 0.006	< 0.010
Fe-59	< 0.016	< 0.017	< 0.015	< 0.012	< 0.008
Co-58	< 0.007	< 0.003	< 0.006	< 0.007	< 0.004
Co-60	< 0.008	< 0.009	< 0.014	< 0.010	< 0.011
Zn-65	< 0.023	< 0.015	< 0.021	< 0.026	< 0.021
Nb-95	< 0.006	< 0.008	< 0.007	< 0.007	< 0.010
Zr-95	< 0.010	< 0.008	< 0.025	< 0.014	< 0.018
I-131	< 0.005	< 0.010	< 0.016	< 0.010	< 0.013
Cs-134	< 0.006	< 0.008	< 0.013	< 0.008	< 0.006
Cs-137	< 0.007	< 0.008	< 0.013	< 0.008	< 0.009
Ba-140[a]	< 0.015	< 0.025	< 0.040	< 0.024	< 0.033
La-140[a]	< 0.004	< 0.006	< 0.010	< 0.004	< 0.007
Ce-144	< 0.042	< 0.055	< 0.089	< 0.040	< 0.071

Date Collected	10-11-95	10-25-95	11-29-95	12-27-95
Be-7	3.18± 0.18	1.01± 0.92	5.72± 0.28	NS[b]
K-40	4.75± 0.27	6.25± 0.24	6.23± 0.35	-
Mn-54	< 0.011	< 0.008	< 0.013	-
Fe-59	< 0.015	< 0.016	< 0.021	-
Co-58	< 0.010	< 0.007	< 0.016	-
Co-60	< 0.013	< 0.011	< 0.018	-
Zn-65	< 0.022	< 0.016	< 0.058	-
Nb-95	< 0.033	< 0.009	< 0.010	-
Zr-95	< 0.022	< 0.009	< 0.022	-
I-131	< 0.017	< 0.007	< 0.034	-
Cs-134	< 0.015	< 0.010	< 0.017	-
Cs-137	< 0.014	< 0.008	< 0.018	-
Ba-140[a]	< 0.045	< 0.029	< 0.056	-
La-140[a]	< 0.009	< 0.003	< 0.010	-
Ce-144	< 0.091	< 0.064	< 0.14	-

[a]LLD at time of counting.

[b]NS= No sample: sample not available

TABLE E-23

GRASS ACTIVITY - CL-2 (pCi/g wet)

Date Collected	01-25-95	02-22-95	03-29-95	04-26-95	05-10-95
Be-7	8.34± 0.16	9.61± 0.25	9.33± 0.21	1.55± 0.10	0.68± 0.06
K-40	2.51± 0.14	2.23± 0.20	2.67± 0.18	6.44± 0.22	4.37± 0.15
Mn-54	< 0.007	< 0.010	< 0.011	< 0.007	< 0.006
Fe-59	< 0.006	< 0.023	< 0.018	< 0.018	< 0.011
Co-58	< 0.006	< 0.010	< 0.006	< 0.005	< 0.004
Co-60	< 0.008	< 0.014	< 0.012	< 0.009	< 0.008
Zn-65	< 0.013	< 0.033	< 0.014	< 0.021	< 0.015
Nb-95	< 0.007	< 0.011	< 0.009	< 0.005	< 0.006
Zr-95	< 0.012	< 0.020	< 0.013	< 0.010	< 0.009
I-131	< 0.007	< 0.009	< 0.015	< 0.007	< 0.008
Cs-134	< 0.008	< 0.011	< 0.011	< 0.010	< 0.007
Cs-137	< 0.007	< 0.010	< 0.011	< 0.006	< 0.005
Ba-140[a]	< 0.016	< 0.020	< 0.042	< 0.015	< 0.019
La-140[a]	< 0.005	< 0.005	< 0.009	< 0.007	< 0.005
Ce-144	< 0.048	< 0.073	< 0.11	< 0.054	< 0.045

Date Collected	05-24-95	06-07-95	06-21-95	07-05-95	07-19-95
Be-7	0.95± 0.63	0.84± 0.07	1.14± 0.07	1.92± 0.11	2.45± 0.78
K-40	4.31± 0.15	6.19± 0.15	6.85± 0.15	6.89± 0.25	9.54± 0.17
Mn-54	< 0.004	< 0.005	< 0.004	< 0.009	< 0.005
Fe-59	< 0.007	< 0.013	< 0.006	< 0.015	< 0.009
Co-58	< 0.004	< 0.004	< 0.005	< 0.008	< 0.005
Co-60	< 0.008	< 0.008	< 0.008	< 0.013	< 0.008
Zn-65	< 0.012	< 0.010	< 0.009	< 0.021	< 0.018
Nb-95	< 0.003	< 0.005	< 0.005	< 0.006	< 0.006
Zr-95	< 0.010	< 0.011	< 0.006	< 0.013	< 0.011
I-131	< 0.008	< 0.005	< 0.005	< 0.009	< 0.004
Cs-134	< 0.006	< 0.007	< 0.005	< 0.009	< 0.006
Cs-137	< 0.006	< 0.006	< 0.006	< 0.007	< 0.004
Ba-140[a]	< 0.022	< 0.018	< 0.019	< 0.019	< 0.017
La-140[a]	< 0.004	< 0.004	< 0.003	< 0.004	< 0.003
Ce-144	< 0.045	< 0.032	< 0.051	< 0.062	< 0.018

[a]LLD at time of counting.

TABLE E-23 (Cont'd)

Date Collected	08-02-95	08-16-95	08-30-95	09-13-95	09-27-95
Be-7	6.58± 0.19	0.94± 0.09	1.63± 0.09	3.59± 0.17	5.00± 0.19
K-40	6.39± 0.28	7.75± 0.25	8.69± 0.22	5.71± 0.25	5.66± 0.29
Mn-54	< 0.010	< 0.008	< 0.008	< 0.010	< 0.010
Fe-59	< 0.011	< 0.017	< 0.017	< 0.025	< 0.022
Co-58	< 0.006	< 0.007	< 0.003	< 0.010	< 0.009
Co-60	< 0.014	< 0.013	< 0.011	< 0.015	< 0.016
Zn-65	< 0.026	< 0.018	< 0.024	< 0.019	< 0.021
Nb-95	< 0.005	< 0.008	< 0.007	< 0.007	< 0.014
Zr-95	< 0.014	< 0.012	< 0.010	< 0.013	< 0.023
I-131	< 0.015	< 0.009	< 0.009	< 0.015	< 0.017
Cs-134	< 0.013	< 0.008	< 0.009	< 0.012	< 0.007
Cs-137	< 0.012	< 0.009	< 0.007	< 0.006	< 0.013
Ba-140[a]	< 0.034	< 0.025	< 0.025	< 0.038	< 0.023
La-140[a]	< 0.007	< 0.004	< 0.002	< 0.005	< 0.008
Ce-144	< 0.080	< 0.035	< 0.046	< 0.070	< 0.083

Date Collected	10-11-95	10-25-95	11-29-95	12-27-95
Be-7	5.04± 0.22	4.28± 0.13	5.68± 0.23	NS[b]
K-40	6.08± 0.30	5.37± 0.20	7.19± 0.37	-
Mn-54	< 0.015	< 0.007	< 0.020	-
Fe-59	< 0.030	< 0.013	< 0.028	-
Co-58	< 0.014	< 0.006	< 0.011	-
Co-60	< 0.015	< 0.007	< 0.026	-
Zn-65	< 0.024	< 0.022	< 0.035	-
Nb-95	< 0.011	< 0.005	< 0.019	-
Zr-95	< 0.037	< 0.014	< 0.041	-
I-131	< 0.019	< 0.007	< 0.034	-
Cs-134	< 0.014	< 0.008	< 0.016	-
Cs-137	< 0.013	< 0.007	< 0.023	-
Ba-140[a]	< 0.046	< 0.023	< 0.069	-
La-140[a]	< 0.012	< 0.005	< 0.009	-
Ce-144	< 0.13	< 0.043	< 0.12	-

[a]LLD at time of counting.
[b]NS = No sample; sample not available.

TABLE E-24

GRASS ACTIVITY - CL-8 (pCi/g wet)

Date Collected	01-25-95	02-22-95	03-29-95	04-26-95	05-10-95
Be-7	7.60± 0.24	11.66± 0.19	9.77± 0.17	1.19± 0.14	0.71± 0.07
K-40	4.58± 0.28	3.01± 0.16	2.59± 0.17	6.44± 0.30	4.67± 0.13
Mn-54	< 0.011	< 0.006	< 0.008	< 0.013	< 0.006
Fe-59	< 0.026	< 0.021	< 0.008	< 0.025	< 0.010
Co-58	< 0.011	< 0.006	< 0.008	< 0.010	< 0.005
Co-60	< 0.010	< 0.013	< 0.010	< 0.007	< 0.006
Zn-65	< 0.014	< 0.040	< 0.029	< 0.014	< 0.006
Nb-95	< 0.009	< 0.009	< 0.009	< 0.011	< 0.006
Zr-95	< 0.016	< 0.013	< 0.025	< 0.022	< 0.006
I-131	< 0.011	< 0.017	< 0.014	< 0.013	< 0.008
Cs-134	< 0.012	< 0.012	< 0.010	< 0.008	< 0.005
Cs-137	< 0.010	< 0.014	< 0.010	< 0.010	< 0.006
Ba-140[a]	< 0.021	< 0.035	< 0.020	< 0.043	< 0.017
La-140[a]	< 0.008	< 0.006	< 0.008	< 0.007	< 0.003
Ce-144	< 0.009	< 0.087	< 0.054	< 0.047	< 0.031

Date Collected	05-24-95	06-07-95	06-21-95	07-05-95	07-19-95
Be-7	1.09± 0.07	1.04± 0.09	1.89± 0.08	2.48± 0.11	2.60± 0.12
K-40	4.62± 0.15	6.06± 0.20	5.23± 0.17	8.09± 0.21	8.61± 0.25
Mn-54	< 0.005	< 0.007	< 0.006	< 0.004	< 0.008
Fe-59	< 0.014	< 0.017	< 0.013	< 0.013	< 0.016
Co-58	< 0.006	< 0.004	< 0.005	< 0.006	< 0.008
Co-60	< 0.008	< 0.010	< 0.009	< 0.011	< 0.013
Zn-65	< 0.021	< 0.026	< 0.014	< 0.027	< 0.028
Nb-95	< 0.006	< 0.008	< 0.005	< 0.008	< 0.007
Zr-95	< 0.017	< 0.019	< 0.011	< 0.011	< 0.017
I-131	< 0.006	< 0.005	< 0.004	< 0.009	< 0.011
Cs-134	< 0.007	< 0.010	< 0.008	< 0.006	< 0.008
Cs-137	< 0.006	< 0.007	< 0.007	< 0.008	< 0.009
Ba-140[a]	< 0.015	< 0.026	< 0.020	< 0.020	< 0.030
La-140[a]	< 0.005	< 0.003	< 0.004	< 0.003	< 0.005
Ce-144	< 0.029	< 0.040	< 0.038	< 0.056	< 0.066

[a]LLD at time of counting.

TABLE E-24 (Cont'd)

Date Collected	08-02-95	08-16-95	08-30-95	09-13-95	09-27-95
Be-7	0.35± 0.07	2.54± 0.08	0.38± 0.10	4.07± 0.18	4.25± 0.14
K-40	6.53± 0.22	7.32± 0.16	6.92± 0.27	6.11± 0.29	6.2± 0.22
Mn-54	< 0.007	< 0.004	< 0.004	< 0.011	< 0.009
Fe-59	< 0.015	< 0.011	< 0.020	< 0.012	< 0.017
Co-58	< 0.008	< 0.003	< 0.005	< 0.010	< 0.004
Co-60	< 0.009	< 0.008	< 0.007	< 0.012	< 0.009
Zn-65	< 0.009	< 0.021	< 0.016	< 0.017	< 0.013
Nb-95	< 0.005	< 0.006	< 0.010	< 0.009	< 0.009
Zr-95	< 0.018	< 0.009	< 0.020	< 0.022	< 0.016
I-131	< 0.006	< 0.004	< 0.011	< 0.013	< 0.008
Cs-134	< 0.010	< 0.005	< 0.011	< 0.013	< 0.008
Cs-137	< 0.007	< 0.006	< 0.009	< 0.012	< 0.009
Ba-140[a]	< 0.028	< 0.015	< 0.034	< 0.026	< 0.028
La-140[a]	< 0.005	< 0.004	< 0.003	< 0.004	< 0.003
Ce-144	< 0.032	< 0.030	< 0.037	< 0.062	< 0.050

Date Collected	10-11-95	10-25-95	11-29-95	12-27-95
Be-7	3.69± 0.15	2.1± 0.13	2.82± 0.24	NS[b]
K-40	4.57± 0.20	9.33± 0.30	10.61± 0.46	-
Mn-54	< 0.005	< 0.007	< 0.016	-
Fe-59	< 0.016	< 0.019	< 0.034	-
Co-58	< 0.004	< 0.011	< 0.008	-
Co-60	< 0.012	< 0.014	< 0.022	-
Zn-65	< 0.028	< 0.022	< 0.034	-
Nb-95	< 0.008	< 0.010	< 0.017	-
Zr-95	< 0.012	< 0.014	< 0.027	-
I-131	< 0.012	< 0.007	< 0.019	-
Cs-134	< 0.010	< 0.012	< 0.016	-
Cs-137	< 0.010	< 0.010	< 0.020	-
Ba-140[a]	< 0.017	< 0.036	< 0.062	-
La-140[a]	< 0.003	< 0.009	< 0.010	-
Ce-144	< 0.050	< 0.047	< 0.12	-

[a]LLD at time of counting.
[b]NS = No sample; sample not available.

TABLE E-25

GRASS ACTIVITY - CL-11 (pCi/g wet)

Date Collected	01-25-95	02-22-95	03-29-95	04-26-95	05-10-95
Be-7	12.24± 0.19	7.76± 0.25	6.44± 0.18	1.84± 0.10	1.95± 0.08
K-40	1.45± 0.14	2.27± 0.20	3.26± 0.21	7.14± 0.23	3.99± 0.14
Mn-54	< 0.008	< 0.008	< 0.010	< 0.007	< 0.005
Fe-59	< 0.014	< 0.016	< 0.018	< 0.018	< 0.008
Co-58	< 0.004	< 0.012	< 0.009	< 0.007	< 0.005
Co-60	< 0.007	< 0.014	< 0.013	< 0.010	< 0.004
Zn-65	< 0.026	< 0.040	< 0.035	< 0.010	< 0.011
Nb-95	< 0.008	< 0.013	< 0.009	< 0.009	< 0.005
Zr-95	< 0.009	< 0.034	< 0.014	< 0.017	< 0.008
I-131	< 0.012	< 0.020	< 0.016	< 0.009	< 0.003
Cs-134	< 0.009	< 0.013	< 0.011	< 0.011	< 0.005
Cs-137	< 0.009	< 0.013	< 0.012	< 0.010	< 0.005
Ba-140[a]	< 0.019	< 0.022	< 0.044	< 0.027	< 0.017
La-140[a]	< 0.004	< 0.011	< 0.008	< 0.006	< 0.002
Ce-144	< 0.084	< 0.087	< 0.070	< 0.058	< 0.036

Date Collected	05-24-95	06-07-95	06-21-95	07-05-95	07-19-95
Be-7	2.44± 0.09	1.40± 0.07	1.66± 0.06	3.10± 0.14	2.65± 0.07
K-40	2.02± 0.12	7.08± 0.16	4.89± 0.12	5.37± 0.24	10.39± 0.17
Mn-54	< 0.005	< 0.006	< 0.004	< 0.008	< 0.006
Fe-59	< 0.009	< 0.008	< 0.008	< 0.019	< 0.012
Co-58	< 0.003	< 0.004	< 0.003	< 0.009	< 0.003
Co-60	< 0.007	< 0.007	< 0.007	< 0.010	< 0.009
Zn-65	< 0.009	< 0.016	< 0.018	< 0.019	< 0.019
Nb-95	< 0.006	< 0.005	< 0.005	< 0.010	< 0.006
Zr-95	< 0.012	< 0.014	< 0.008	< 0.011	< 0.013
I-131	< 0.008	< 0.006	< 0.006	< 0.008	< 0.006
Cs-134	< 0.006	< 0.008	< 0.005	< 0.010	< 0.006
Cs-137	< 0.006	< 0.006	< 0.006	< 0.010	< 0.006
Ba-140[a]	< 0.009	< 0.012	< 0.019	< 0.026	< 0.017
La-140[a]	< 0.003	< 0.003	< 0.002	< 0.007	< 0.004
Ce-144	< 0.052	< 0.022	< 0.068	< 0.055	< 0.043

[a] LLD at time of counting.

TABLE E-25 (Cont'd)

Date Collected	08-02-95	08-16-95	08-30-95	09-13-95	09-27-95
Be-7	0.60± 0.08	0.28± 0.06	0.96± 0.11	1.32± 0.13	2.98± 0.15
K-40	8.00± 0.02	6.10± 0.20	9.49± 0.30	7.50± 0.31	11.79± 0.31
Mn-54	< 0.006	< 0.007	< 0.009	< 0.013	< 0.009
Fe-59	< 0.015	< 0.014	< 0.021	< 0.022	< 0.018
Co-58	< 0.007	< 0.006	< 0.010	< 0.012	< 0.009
Co-60	< 0.010	< 0.009	< 0.015	< 0.018	< 0.010
Zn-65	< 0.009	< 0.016	< 0.027	< 0.029	< 0.012
Nb-95	< 0.008	< 0.005	< 0.008	< 0.013	< 0.011
Zr-95	< 0.017	< 0.014	< 0.018	< 0.016	< 0.018
I-131	< 0.006	< 0.008	< 0.006	< 0.016	< 0.013
Cs-134	< 0.009	< 0.007	< 0.012	< 0.013	< 0.011
Cs-137	< 0.007	< 0.007	< 0.007	< 0.011	< 0.010
Ba-140[a]	< 0.021	< 0.021	< 0.029	< 0.021	< 0.032
La-140[a]	< 0.005	< 0.006	< 0.004	< 0.005	< 0.007
Ce-144	< 0.067	< 0.022	< 0.052	< 0.085	< 0.039

Date Collected	10-11-95	10-25-95	11-29-95	12-27-95
Be-7	2.62± 0.18	4.30± 0.12	11.57± 0.39	NS[b]
K-40	7.45± 0.31	7.65± 0.21	5.05± 0.42	-
Mn-54	< 0.015	< 0.007	< 0.017	-
Fe-59	< 0.020	< 0.017	< 0.030	-
Co-58	< 0.008	< 0.007	< 0.017	-
Co-60	< 0.017	< 0.009	< 0.025	-
Zn-65	< 0.032	< 0.027	< 0.072	-
Nb-95	< 0.012	< 0.007	< 0.028	-
Zr-95	< 0.019	< 0.010	< 0.028	-
I-131	< 0.020	< 0.011	< 0.049	-
Cs-134	< 0.015	< 0.008	< 0.028	-
Cs-137	< 0.016	< 0.007	0.069 ± 0.023	-
Ba-140a	< 0.030	< 0.023	< 0.073	-
La-140a	< 0.008	< 0.005	< 0.021	-
Ce-144	< 0.094	< 0.052	< 0.16	-

[a]LLD at time of counting.
[b] NS = No sample; sample not available.

TABLE E-26

GRASS ACTIVITY - CL-116 (pCi/g wet)

Date Collected	01-25-95	02-22-95	03-29-95	04-26-95	05-10-95
Be-7	11.44± 0.25	11.79± 0.34	12.20± 0.21	1.66± 0.13	1.24± 0.06
K-40	2.27± 0.20	3.00± 0.30	1.82± 0.15	7.41± 0.24	4.39± 0.12
Mn-54	< 0.009	< 0.015	< 0.007	< 0.009	< 0.005
Fe-59	< 0.022	< 0.018	< 0.015	< 0.019	< 0.010
Co-58	< 0.011	< 0.014	< 0.008	< 0.009	< 0.004
Co-60	< 0.013	< 0.019	< 0.008	< 0.010	< 0.006
Zn-65	< 0.032	< 0.052	< 0.028	< 0.026	< 0.014
Nb-95	< 0.012	< 0.009	< 0.011	< 0.004	< 0.004
Zr-95	< 0.024	< 0.027	< 0.011	< 0.012	< 0.009
I-131	< 0.015	< 0.020	< 0.014	< 0.011	< 0.003
Cs-134	< 0.011	< 0.016	< 0.011	< 0.011	< 0.006
Cs-137	< 0.010	< 0.020	< 0.008	< 0.010	< 0.004
Ba-140[a]	< 0.038	< 0.062	< 0.038	< 0.028	< 0.014
La-140[a]	< 0.008	< 0.007	< 0.005	< 0.004	< 0.002
Ce-144	< 0.11	< 0.11	< 0.057	< 0.065	< 0.027

Date Collected	05-24-95	06-07-95	06-21-95	07-05-95	07-19-95
Be-7	0.99± 0.09	1.50± 0.08	1.60± 0.08	2.98± 0.10	3.93± 0.17
K-40	4.15± 0.19	6.87± 0.21	5.29± 0.16	6.91± 0.19	7.91± 0.30
Mn-54	< 0.007	< 0.007	< 0.005	< 0.007	< 0.009
Fe-59	< 0.012	< 0.009	< 0.013	< 0.012	< 0.017
Co-58	< 0.003	< 0.006	< 0.006	< 0.004	< 0.005
Co-60	< 0.008	< 0.007	< 0.009	< 0.009	< 0.017
Zn-65	< 0.008	< 0.022	< 0.009	< 0.022	< 0.023
Nb-95	< 0.006	< 0.007	< 0.005	< 0.006	< 0.009
Zr-95	< 0.008	< 0.014	< 0.007	< 0.009	< 0.015
I-131	< 0.006	< 0.008	< 0.008	< 0.008	< 0.007
Cs-134	< 0.008	< 0.009	< 0.005	< 0.007	< 0.012
Cs-137	< 0.008	< 0.007	< 0.004	< 0.007	< 0.009
Ba-140[a]	< 0.024	< 0.023	< 0.020	< 0.019	< 0.037
La-140[a]	< 0.004	< 0.004	< 0.006	< 0.003	< 0.005
Ce-144	< 0.034	< 0.035	< 0.037	< 0.071	< 0.055

[a] LLD at time of counting.

TABLE E-26 (Cont'd)

Date Collected	08-02-95	08-16-95	08-30-95	09-13-95	09-27-95
Be-7	3.56± 0.15	0.60± 0.06	1.14± 0.08	1.69± 0.14	2.49± 0.15
K-40	3.98± 0.21	9.81± 0.20	9.27± 0.20	7.98± 0.28	6.90± 0.31
Mn-54	< 0.008	< 0.006	< 0.003	< 0.010	< 0.006
Fe-59	< 0.013	< 0.008	< 0.010	< 0.012	< 0.014
Co-58	< 0.010	< 0.006	< 0.005	< 0.011	< 0.010
Co-60	< 0.011	< 0.009	< 0.004	< 0.012	< 0.017
Zn-65	< 0.017	< 0.009	< 0.023	< 0.012	< 0.025
Nb-95	< 0.006	< 0.006	< 0.006	< 0.009	< 0.012
Zr-95	< 0.012	< 0.012	< 0.008	< 0.016	< 0.012
I-131	< 0.012	< 0.007	< 0.005	< 0.014	< 0.017
Cs-134	< 0.011	< 0.006	< 0.008	< 0.007	< 0.013
Cs-137	< 0.011	< 0.007	< 0.006	< 0.010	< 0.008
Ba-140[a]	< 0.038	< 0.012	< 0.024	< 0.032	< 0.021
La-140[a]	< 0.006	< 0.002	< 0.002	< 0.007	< 0.009
Ce-144	< 0.075	< 0.022	< 0.036	< 0.087	< 0.041

Date Collected	10-11-95	10-25-95	11-29-95	12-27-95
Be-7	3.13± 0.17	2.09± 0.12	7.46± 0.27	NS[b]
K-40	6.33± 0.31	5.47± 0.23	7.43± 0.38	-
Mn-54	< 0.009	< 0.008	< 0.015	-
Fe-59	< 0.028	< 0.009	< 0.031	-
Co-58	< 0.011	< 0.006	< 0.008	-
Co-60	< 0.010	< 0.007	< 0.017	-
Zn-65	< 0.029	< 0.024	< 0.019	-
Nb-95	< 0.013	< 0.008	< 0.010	-
Zr-95	< 0.021	< 0.013	< 0.022	-
I-131	< 0.012	< 0.012	< 0.027	-
Cs-134	< 0.014	< 0.010	< 0.015	-
Cs-137	< 0.014	< 0.007	< 0.018	-
Ba-140[a]	< 0.045	< 0.016	< 0.055	-
La-140[a]	< 0.005	< 0.006	< 0.007	-
Ce-144	< 0.082	< 0.043	< 0.098	-

[a] LLD at time of counting.

[b] NS = No sample; sample not available.

TABLE E-27

GREEN LEAFY VEGETABLE ACTIVITY - CL-114 (control)(pCi/l)

Sample Type	Chard	Lettuce	Cabbage	Chard	Lettuce	Cabbage
Date Collected	06-28-95	06-28-95	06-28-95	07-26-95	07-26-95	07-26-95
Gross Beta	6.51± 0.21	3.49± 0.14	4.21± 0.14	5.08± 0.18	3.40± 0.12	2.15± 0.06
Be-7	0.22± 0.09	0.25± 0.07	< 0.064	0.19± 0.04	0.19± 0.06	<0.080
K-40	6.40± 0.26	3.49± 0.16	4.30± 0.20	6.19± 0.15	3.21± 0.15	2.61±0.14
Mn-54	< 0.012	< 0.006	< 0.005	< 0.003	< 0.005	<0.007
Fe-59	< 0.025	< 0.008	< 0.018	< 0.005	< 0.015	<0.020
Co-58	< 0.009	< 0.003	< 0.006	< 0.005	< 0.004	<0.009
Co-60	< 0.016	< 0.007	< 0.007	< 0.007	< 0.004	<0.006
Zn-65	< 0.024	< 0.023	< 0.017	< 0.009	< 0.013	<0.007
Nb-95	< 0.012	< 0.008	< 0.005	< 0.006	< 0.004	<0.010
Zr-95	< 0.019	< 0.008	< 0.019	< 0.005	< 0.007	<0.010
I-131	< 0.008	< 0.007	< 0.005	< 0.008	< 0.008	<0.013
Cs-134	< 0.007	< 0.007	< 0.008	< 0.005	< 0.005	<0.007
Cs-137	< 0.013	< 0.008	< 0.007	< 0.006	< 0.006	<0.007
Ba-140[a]	< 0.036	< 0.019	< 0.028	< 0.009	< 0.019	<0.019
La-140[a]	< 0.005	< 0.004	< 0.005	< 0.003	< 0.004	<0.003
Ce-144	< 0.071	< 0.019	< 0.029	< 0.049	< 0.062	<0.041

Sample Type	Chard	Cabbage	Collards	Chard	Cabbage	Kale
Date Collected	08-30-95	08-30-95	08-30-95	09-27-95	09-27-95	09-27-95
Gross Beta	6.98± 0.24	2.78± 0.08	4.13± 0.12	3.89± 0.13	2.25± 0.08	3.92±0.15
Be-7	0.10± 0.03	0.09± 0.03	0.199± 0.03	0.09± 0.03	0.07± 0.03	0.17± 0.05
K-40	4.03± 0.10	2.44± 0.07	4.63± 0.08	4.36± 0.12	2.19± 0.09	3.60± 0.13
Mn-54	< 0.002	< 0.003	< 0.003	< 0.003	<0.003	<0.005
Fe-59	< 0.008	< 0.007	< 0.007	< 0.010	<0.006	<0.012
Co-58	< 0.002	< 0.003	< 0.003	< 0.004	<0.003	<0.004
Co-60	< 0.006	< 0.003	< 0.005	< 0.005	<0.005	<0.005
Zn-65	< 0.009	< 0.009	< 0.007	< 0.005	<0.008	<0.010
Nb-95	< 0.002	< 0.003	< 0.003	< 0.004	<0.004	<0.005
Zr-95	< 0.006	< 0.009	< 0.005	< 0.008	<0.005	<0.010
I-131	< 0.003	< 0.004	< 0.003	< 0.007	<0.005	<0.004
Cs-134	< 0.004	< 0.003	< 0.004	< 0.005	<0.002	<0.006
Cs-137	< 0.002	< 0.004	< 0.004	< 0.004	<0.004	<0.006
Ba-140[a]	< 0.012	< 0.011	< 0.009	< 0.012	<0.009	<0.011
La-140[a]	< 0.002	< 0.003	< 0.001	< 0.002	<0.003	<0.004
Ce-144	< 0.042	< 0.031	< 0.020	< 0.018	<0.026	<0.033

[a] LLD at time of counting.

TABLE E-28

GREEN LEAFY VEGETABLE ACTIVITY - CL-115 (pCi/l)

Sample Type	NS[b]	Lettuce	Cabbage	Kale	Cabbage
Date Collected	06-28-95	07-26-95	07-26-95	07-26-95	08-30-95
Gross Beta	-	3.39± 0.13	3.60± 0.13	5.28± 0.18	2.99± 0.10
Be-7	-	0.42± 0.08	< 0.098	0.11± 0.04	<0.044
K-40	-	3.76± 0.17	2.59± 0.18	4.38± 0.13	3.21± 0.13
Mn-54	-	< 0.006	< 0.008	< 0.005	< 0.005
Fe-59	-	< 0.016	< 0.014	< 0.008	< 0.011
Co-58	-	< 0.007	< 0.011	< 0.005	< 0.006
Co-60	-	< 0.010	< 0.008	< 0.006	< 0.008
Zn-65	-	< 0.025	< 0.010	< 0.008	< 0.008
Nb-95	-	< 0.007	< 0.015	< 0.003	< 0.008
Zr-95	-	< 0.008	< 0.022	< 0.003	< 0.005
I-131	-	< 0.007	< 0.017	< 0.005	< 0.007
Cs-134	-	< 0.008	< 0.012	< 0.006	< 0.004
Cs-137	-	< 0.008	< 0.011	< 0.003	< 0.006
Ba-140[a]	-	< 0.030	< 0.029	< 0.006	< 0.005
La-140[a]	-	< 0.008	< 0.005	< 0.003	< 0.017
Ce-144	-	< 0.046	< 0.17	< 0.014	< 0.002
					< 0.044

Sample Type	Kale	Collards	Cabbage	Collards	Kale
Date Collected	08-30-95	08-30-95	09-27-95	09-27-95	09-27-95
Gross Beta	3.66± 0.14	4.01± 0.15	3.06± 0.10	4.65± 0.19	5.66± 0.20
Be-7	0.10± 0.05	0.09± 0.04	< 0.045	0.36± 0.06	0.21± 0.05
K-40	4.00± 0.19	3.85± 0.16	3.18± 0.15	4.39± 0.20	4.60± 0.14
Mn-54	< 0.008	< 0.005	< 0.005	< 0.007	< 0.005
Fe-59	< 0.016	< 0.014	< 0.012	< 0.018	< 0.006
Co-58	< 0.003	< 0.009	< 0.002	< 0.006	< 0.003
Co-60	< 0.010	< 0.009	< 0.007	< 0.010	< 0.007
Zn-65	< 0.018	< 0.007	< 0.012	< 0.012	< 0.009
Nb-95	< 0.007	< 0.003	< 0.005	< 0.003	< 0.013
Zr-95	< 0.019	< 0.012	< 0.012	< 0.017	< 0.004
I-131	< 0.010	< 0.007	< 0.009	< 0.011	< 0.008
Cs-134	< 0.005	< 0.006	< 0.006	< 0.009	< 0.006
Cs-137	< 0.008	< 0.006	< 0.005	< 0.008	< 0.006
Ba-140[a]	< 0.024	< 0.017	< 0.020	< 0.027	< 0.020
La-140[a]	< 0.003	< 0.005	< 0.003	< 0.003	< 0.004
Ce-144	< 0.044	< 0.036	< 0.023	< 0.060	< 0.045

[a] LLD at time of counting.
[b] NS=no sample; sample unavailable

TABLE E-29

GREEN LEAFY VEGETABLE ACTIVITY - CL-117 (pCi/l)

Sample Type	Cabbage	Kale	Collards	Collards	Cabbage	Lettuce
Date Collected	06-28-95	06-28-95	06-28-95	07-26-95	07-26-95	07-26-95
Gross Beta	4.39± 0.14	4.84± 0.17	3.80± 0.14	8.19± 0.23	2.34± 0.06	5.65± 0.19
Be-7	< 0.045	< 0.052	0.10± 0.04	0.10± 0.05	< 0.049	0.28± 0.09
K-40	4.18± 0.13	4.33± 0.19	4.57± 0.14	5.87± 0.17	2.79± 0.09	5.87± 0.23
Mn-54	< 0.004	< 0.004	< 0.006	< 0.005	< 0.005	< 0.008
Fe-59	< 0.011	< 0.016	< 0.006	< 0.013	< 0.013	< 0.016
Co-58	< 0.005	< 0.005	< 0.004	< 0.006	< 0.005	< 0.009
Co-60	< 0.008	< 0.011	< 0.009	< 0.007	< 0.007	< 0.009
Zn-65	< 0.018	< 0.017	< 0.014	< 0.008	< 0.009	< 0.021
Nb-95	< 0.005	< 0.007	< 0.007	< 0.005	< 0.006	< 0.009
Zr-95	< 0.013	< 0.007	< 0.007	< 0.013	< 0.006	< 0.011
I-131	< 0.005	< 0.004	< 0.007	< 0.006	< 0.007	< 0.007
Cs-134	< 0.011	< 0.004	< 0.006	< 0.007	< 0.004	< 0.005
Cs-137	< 0.005	< 0.007	< 0.006	< 0.006	< 0.006	< 0.008
Ba-140[a]	< 0.010	< 0.020	< 0.020	< 0.019	< 0.009	< 0.037
La-140[a]	< 0.004	< 0.003	< 0.005	< 0.003	< 0.003	< 0.005
Ce-144	< 0.040	< 0.024	< 0.024	< 0.033	< 0.036	< 0.069

Sample Type	Cabbage	Kale	Collards	Kale	Cabbage	Collards
Date Collected	08-30-95	08-30-95	08-30-95	09-27-95	09-27-95	09-27-95
Gross Beta	2.57± 0.08	3.16± 0.13	4.29± 0.15	4.79± 0.17	2.34± 0.07	3.37± 0.14
Be-7	<0.042	0.18± 0.04	0.18± 0.03	0.17± 0.06	<0.051	0.17± 0.06
K-40	2.79± 0.13	4.36± 0.14	3.83± 0.10	4.01± 0.19	1.90± 0.11	3.36± 0.15
Mn-54	< 0.003	< 0.005	< 0.004	< 0.007	< 0.005	< 0.006
Fe-59	< 0.013	< 0.011	< 0.004	< 0.016	< 0.009	< 0.012
Co-58	< 0.006	< 0.004	< 0.004	< 0.007	< 0.005	< 0.007
Co-60	< 0.007	< 0.007	< 0.006	< 0.009	< 0.006	< 0.006
Zn-65	< 0.008	< 0.016	< 0.009	< 0.011	< 0.006	< 0.011
Nb-95	< 0.004	< 0.003	< 0.004	< 0.003	< 0.003	< 0.004
Zr-95	< 0.012	< 0.009	< 0.008	< 0.014	< 0.010	< 0.015
I-131	< 0.008	< 0.004	< 0.005	< 0.004	< 0.008	< 0.006
Cs-134	< 0.006	< 0.005	< 0.005	< 0.008	< 0.005	< 0.006
Cs-137	< 0.006	< 0.005	< 0.005	< 0.006	< 0.005	< 0.004
Ba-140[a]	< 0.015	< 0.009	< 0.013	< 0.015	< 0.016	< 0.011
La-140[a]	< 0.005	< 0.003	< 0.001	< 0.002	< 0.005	< 0.005
Ce-144	< 0.041	< 0.038	< 0.015	< 0.035	< 0.049	< 0.048

[a]LLD at time of counting.

TABLE E-30

GREEN LEAFY VEGETABLE ACTIVITY - CL-118 (pCi/l)

Sample Type	Chard	Kale	Collards	Chard	Lettuce	Cabbage
Date Collected	06-28-95	06-28-95	06-28-95	07-26-95	07-26-95	07-26-95
Gross Beta	7.03± 0.21	5.53± 0.19	4.52± 0.20	10.13± 0.30	4.64± 0.14	2.53± 0.09
Be-7	0.28± 0.08	0.13± 0.05	0.14± 0.06	0.33± 0.07	0.31± 0.06	< 0.15
K-40	6.65± 0.25	5.04± 0.15	4.17± 0.14	9.14± 0.24	5.57± 0.15	1.48± 0.26
Mn-54	< 0.009	< 0.005	< 0.006	< 0.008	< 0.005	< 0.011
Fe-59	< 0.018	< 0.009	< 0.006	< 0.014	< 0.010	< 0.020
Co-58	< 0.009	< 0.005	< 0.005	< 0.006	< 0.002	< 0.015
Co-60	< 0.015	< 0.008	< 0.008	< 0.009	< 0.007	< 0.013
Zn-65	< 0.020	< 0.019	< 0.014	< 0.015	< 0.019	< 0.026
Nb-95	< 0.005	< 0.005	< 0.007	< 0.008	< 0.006	< 0.014
Zr-95	< 0.017	< 0.010	< 0.016	< 0.008	< 0.019	< 0.015
I-131	< 0.009	< 0.005	< 0.009	< 0.005	< 0.007	< 0.028
Cs-134	< 0.010	< 0.006	< 0.005	< 0.004	< 0.006	< 0.015
Cs-137	< 0.008	< 0.006	< 0.007	< 0.007	< 0.006	< 0.009
Ba-140[a]	< 0.035	< 0.010	< 0.023	< 0.025	< 0.018	< 0.029
La-140[a]	< 0.008	< 0.002	< 0.003	< 0.002	< 0.003	< 0.019
Ce-144	< 0.07	< 0.035	< 0.053	< 0.073	< 0.076	< 0.15

Sample Type	Chard	Cabbage	Kale	Kale	Cabbage	Collards
Date Collected	08-30-95	08-30-95	08-30-95	09-27-95	09-27-95	09-27-95
Gross Beta	7.75± 0.22	2.63± 0.11	5.50± 0.16	4.44± 0.17	2.71± 0.09	5.45± 0.21
Be-7	<0.054	0.11± 0.05	0.11± 0.04	0.15± 0.08	< 0.053	0.17± 0.05
K-40	5.47± 0.16	3.27± 0.15	5.27± 0.13	4.26± 0.22	2.47± 0.13	5.45± 0.19
Mn-54	< 0.004	< 0.004	< 0.005	< 0.007	< 0.006	< 0.004
Fe-59	< 0.013	< 0.007	< 0.009	< 0.010	< 0.014	< 0.015
Co-58	< 0.006	< 0.004	< 0.003	< 0.011	< 0.004	< 0.007
Co-60	< 0.005	< 0.008	< 0.006	< 0.015	< 0.007	< 0.009
Zn-65	< 0.013	< 0.009	< 0.015	< 0.029	< 0.006	< 0.016
Nb-95	< 0.005	< 0.005	< 0.003	< 0.012	< 0.006	< 0.008
Zr-95	< 0.011	< 0.007	< 0.006	< 0.014	< 0.011	< 0.008
I-131	< 0.007	< 0.005	< 0.008	< 0.014	< 0.008	< 0.012
Cs-134	< 0.007	< 0.006	< 0.005	< 0.006	< 0.007	< 0.006
Cs-137	< 0.005	< 0.006	< 0.005	< 0.012	< 0.006	< 0.007
Ba-140[a]	< 0.017	< 0.020	< 0.020	< 0.026	< 0.012	< 0.018
La-140[a]	< 0.003	< 0.005	< 0.002	< 0.007	< 0.005	< 0.002
Ce-144	< 0.038	< 0.035	< 0.036	< 0.082	< 0.043	< 0.042

[a]LLD at time of counting.

TABLE E-31

MEAT ACTIVITY - CL-106 (pCi/g wet)

Date Collected	1/20/95	1/20/95	1/20/95
Type	Bovine Thyroid	Bovine Liver	Beef (Edible Portions)
Be-7	< 0.43	< 0.064	< 0.067
K-40	< 1.40	2.53± 0.17	2.36± 0.13
Mn-54	< 0.042	< 0.007	< 0.004
Fe-59	< 0.089	< 0.016	< 0.007
Co-58	< 0.063	< 0.007	< 0.005
Co-60	< 0.046	< 0.009	< 0.005
Zn-65	< 0.15	< 0.008	< 0.010
Nb-95	< 0.042	< 0.012	< 0.007
Zr-95	< 0.056	< 0.020	< 0.009
Ru-103	< 0.042	< 0.010	< 0.009
Ru-106	< 0.320	< 0.067	< 0.055
I-131	< 0.18	< 0.029	< 0.040
Cs-134	< 0.048	< 0.008	< 0.006
Cs-137	< 0.038	< 0.007	< 0.004
Ba-140[a]	< 0.14	< 0.018	< 0.016
La-140[a]	< 0.019	< 0.006	< 0.004
Ce-141	< 0.082	< 0.018	< 0.013
Ce-144	< 0.18	< 0.048	< 0.031

[a] LLD at time of counting.

TABLE E-32

FISH ACTIVITY - CL-19 (pCi/g wet)

Date Collected	04-06-95	04-06-95	04-06-95	04-06-95
Type	Blue Gill	Crappie	Carp	Largemouth Bass
Be-7	< 0.065	< 0.076	< 0.059	< 0.073
K-40	2.64± 0.15	2.94± 0.18	2.87± 0.02	3.25± 0.18
Mn-54	< 0.004	< 0.007	< 0.005	< 0.007
Fe-59	< 0.010	< 0.015	< 0.016	< 0.010
Co-58	< 0.007	< 0.004	< 0.007	< 0.010
Co-60	< 0.006	< 0.009	< 0.007	< 0.005
Zn-65	< 0.014	< 0.013	< 0.014	< 0.007
Nb-95	< 0.007	< 0.010	< 0.008	< 0.01
Zr-95	< 0.009	< 0.011	< 0.016	< 0.008
Ru-103	< 0.006	< 0.009	< 0.008	< 0.019
Ru-106	< 0.037	< 0.063	< 0.032	< 0.005
Cs-134	< 0.007	< 0.008	< 0.006	< 0.036
Cs-137	< 0.005	< 0.007	< 0.003	< 0.005
Ba-140[a]	< 0.020	< 0.013	< 0.020	< 0.008
La-140[a]	< 0.004	< 0.006	< 0.005	< 0.027
Ce-141	< 0.006	< 0.016	< 0.011	< 0.007
Ce-144	< 0.036	< 0.048	< 0.021	< 0.013
				< 0.046

Date Collected	10-16-95	10-16-95	10-16-95	10-16-95
Type	Blue Gill	Crappie	Carp	Largemouth Bass
Be-7	< 0.13	< 0.077	< 0.037	< 0.041
K-40	2.16± 0.21	3.21± 0.18	2.69± 0.10	3.07± 0.15
Mn-54	< 0.012	< 0.008	< 0.003	< 0.006
Fe-59	< 0.024	< 0.027	< 0.013	< 0.011
Co-58	< 0.012	< 0.006	< 0.003	< 0.005
Co-60	< 0.011	< 0.009	< 0.006	< 0.007
Zn-65	< 0.015	< 0.021	< 0.009	< 0.013
Nb-95	< 0.016	< 0.013	< 0.007	< 0.005
Zr-95	< 0.027	< 0.015	< 0.007	< 0.008
Ru-103	< 0.016	< 0.005	< 0.008	< 0.003
Ru-106	< 0.064	< 0.030	< 0.043	< 0.052
Cs-134	< 0.012	< 0.006	< 0.003	< 0.007
Cs-137	< 0.012	< 0.006	< 0.005	< 0.006
Ba-140[a]	< 0.019	< 0.011	< 0.013	< 0.018
La-140[a]	< 0.005	< 0.006	< 0.003	< 0.002
Ce-141	< 0.030	< 0.018	< 0.009	< 0.009
Ce-144	< 0.058	< 0.042	< 0.036	< 0.022

[a] LLD at time of counting.

TABLE E-33

FISH ACTIVITY - CL-105 (control)(pCi/g wet)

Date Collected	04-07-95	04-07-95	04-07-95	04-07-95
Type	Largemouth Bass	Carp	Crappie	Blue Gill
Be-7	< 0.033	< 0.048	< 0.055	< 0.054
K-40	2.97± 0.15	3.26± 0.14	3.10± 0.16	2.23± 0.14
Mn-54	< 0.005	< 0.005	< 0.007	< 0.005
Fe-59	< 0.009	< 0.006	< 0.016	< 0.014
Co-58	< 0.007	< 0.004	< 0.005	< 0.007
Co-60	< 0.008	< 0.006	< 0.007	< 0.006
Zn-65	< 0.007	< 0.019	< 0.011	< 0.01
Nb-95	< 0.006	< 0.006	< 0.008	< 0.009
Zr-95	< 0.014	< 0.008	< 0.017	< 0.012
Ru-103	< 0.008	< 0.005	< 0.007	< 0.007
Ru-106	< 0.045	< 0.028	< 0.058	< 0.048
Cs-134	< 0.007	< 0.005	< 0.006	< 0.005
Cs-137	< 0.004	< 0.006	< 0.007	< 0.007
Ba-140[a]	< 0.015	< 0.011	< 0.023	< 0.016
La-140[a]	< 0.003	< 0.002	< 0.005	< 0.005
Ce-141	< 0.008	< 0.007	< 0.009	< 0.011
Ce-144	< 0.041	< 0.038	< 0.042	< 0.025

Date Collected	10-17-95	10-17-95	10-17-95	10-17-95
Type	Largemouth Bass	Carp	Crappie	Blue Gill
Be-7	< 0.076	< 0.10	< 0.094	< 0.088
K-40	2.92± 0.15	2.72± 0.17	2.70± 0.21	2.16± 0.14
Mn-54	< 0.007	< 0.009	< 0.009	< 0.005
Fe-59	< 0.019	< 0.012	< 0.036	< 0.021
Co-58	< 0.006	< 0.008	< 0.012	< 0.007
Co-60	< 0.008	< 0.009	< 0.006	< 0.008
Zn-65	< 0.019	< 0.016	< 0.013	< 0.014
Nb-95	< 0.011	< 0.013	< 0.008	< 0.012
Zr-95	< 0.009	< 0.019	< 0.028	< 0.018
Ru-103	< 0.011	< 0.010	< 0.014	< 0.009
Ru-106	< 0.038	< 0.037	< 0.078	< 0.042
Cs-134	< 0.007	< 0.009	< 0.010	< 0.004
Cs-137	< 0.007	< 0.008	< 0.010	< 0.004
Ba-140[a]	< 0.019	< 0.025	< 0.036	< 0.022
La-140[a]	< 0.003	< 0.004	< 0.005	< 0.004
Ce-141	< 0.015	< 0.021	< 0.014	< 0.021
Ce-144	< 0.028	< 0.039	< 0.056	< 0.043

[a] LLD at time of counting.

TABLE E-34

AQUATIC VEGETATION ACTIVITY - (pCi/g wet)

Location Date Collected	CL-7B 04-06-95	CL-7C 04-06-95	CL-9 04-06-95	CL-10 04-06-95
Be-7	0.90± 0.26	< 0.44	0.55± 0.25	0.66± 0.30
K-40	1.67± 0.38	< 1.02	0.80± 0.46	2.52± 0.55
Mn-54	< 0.021	< 0.045	< 0.020	< 0.031
Fe-59	< 0.041	< 0.070	< 0.063	< 0.033
Co-58	< 0.012	< 0.029	< 0.023	< 0.026
Co-60	< 0.028	< 0.048	< 0.029	< 0.039
Zn-65	< 0.079	< 0.065	< 0.089	< 0.11
Nb-95	< 0.028	< 0.040	< 0.029	< 0.039
Zr-95	< 0.026	< 0.090	< 0.033	< 0.063
Cs-134	< 0.027	< 0.050	< 0.033	< 0.029
Cs-137	0.036± 0.021	< 0.051	< 0.029	0.033± 0.026
Ba-140[a]	< 0.076	< 0.089	< 0.075	< 0.084
La-140[a]	< 0.012	< 0.042	< 0.010	< 0.020
Ce-144	< 0.12	< 0.15	< 0.078	< 0.16

Location Date Collected	CL-19 04-06-95	CL-105 04-06-95
Be-7	0.52± 0.16	< 0.24
K-40	1.21± 0.28	1.57± 0.29
Mn-54	< 0.017	< 0.016
Fe-59	< 0.013	< 0.037
Co-58	< 0.017	< 0.022
Co-60	< 0.020	< 0.031
Zn-65	< 0.027	< 0.037
Nb-95	< 0.023	< 0.013
Zr-95	< 0.019	< 0.032
Cs-134	< 0.017	< 0.026
Cs-137	< 0.024	0.030± 0.014
Ba-140[a]	< 0.063	< 0.079
La-140[a]	< 0.008	< 0.024
Ce-144	< 0.076	< 0.088

[a] LLD at time of counting.

TABLE E-34 (Cont'd)

Location Date Collected	CL-7B 06-15-95	CL-7C 06-15-95	CL-9 06-15-95	CL-10 06-15-95
Be-7	0.84± 0.27	1.21± 0.43	2.27± 0.63	< 0.69
K-40	1.98± 0.36	< 0.85	3.56± 0.53	1.88± 0.63
Mn-54	< 0.022	< 0.028	< 0.027	< 0.044
Fe-59	< 0.055	< 0.049	< 0.084	< 0.16
Co-58	< 0.029	< 0.037	< 0.041	< 0.040
Co-60	< 0.017	< 0.030	< 0.032	< 0.033
Zn-65	< 0.031	< 0.11	< 0.11	< 0.086
Nb-95	< 0.034	< 0.079	< 0.051	< 0.058
Zr-95	< 0.064	< 0.062	< 0.088	< 0.065
Cs-134	< 0.028	< 0.037	< 0.036	< 0.029
Cs-137	< 0.028	< 0.031	0.069± 0.037	< 0.045
Ba-140[a]	< 0.051	< 0.10	< 0.12	< 0.074
La-140[a]	< 0.014	< 0.015	< 0.032	< 0.028
Ce-144	< 0.070	< 0.21	< 0.19	< 0.13

Location Date Collected	CL-19 06-15-95
Be-7	1.48± 0.44
K-40	2.37± 0.36
Mn-54	< 0.023
Fe-59	< 0.10
Co-58	< 0.030
Co-60	< 0.029
Zn-65	< 0.078
Nb-95	< 0.061
Zr-95	< 0.093
Cs-134	< 0.029
Cs-137	0.052± 0.023
Ba-140[a]	< 0.092
La-140[a]	< 0.022
Ce-144	< 0.16

[a] LLD at time of counting.

TABLE E-34 (Cont'd)

Location Date Collected	CL-7B 08-28-95	CL-7C 08-28-95	CL-9 08-28-95	CL-10 08-28-95
Be-7	0.83± 0.25	0.43± 0.16	1.27± 0.24	0.54± 0.32
K-40	2.79± 0.46	0.68± 0.35	3.12± 0.35	2.08± 0.41
Mn-54	< 0.030	< 0.020	< 0.020	< 0.026
Fe-59	< 0.061	< 0.039	< 0.026	< 0.04
Co-58	< 0.023	< 0.019	< 0.011	< 0.029
Co-60	< 0.031	< 0.021	< 0.023	< 0.026
Zn-65	< 0.10	< 0.034	< 0.067	< 0.11
Nb-95	< 0.041	< 0.025	< 0.021	< 0.039
Zr-95	< 0.034	< 0.047	< 0.042	< 0.080
Cs-134	< 0.030	< 0.023	< 0.021	< 0.033
Cs-137	< 0.030	< 0.022	0.060± 0.018	0.053± 0.025
Ba-140[a]	< 0.10	< 0.052	< 0.069	< 0.10
La-140[a]	< 0.017	< 0.014	< 0.013	< 0.0[illegible]2
Ce-144	< 0.18	< 0.065	< 0.079	< 0.1[illegible]

Location Date Collected	CL-19 08-28-95
Be-7	2.21± 0.32
K-40	5.46± 0.55
Mn-54	< 0.030
Fe-59	< 0.06
Co-58	< 0.030
Co-60	< 0.028
Zn-65	< 0.089
Nb-95	< 0.025
Zr-95	< 0.089
Cs-134	< 0.027
Cs-137	0.088± 0.026
Ba-140[a]	< 0.084
La-140[a]	< 0.022
Ce-144	< 0.13

[a] LLD at time of counting.

TABLE E-34 (Cont'd)

Location Date Collected	CL-7B 10-16-95	CL-7C 10-16-95	CL-9 10-16-95	CL-10 10-16-95
Be-7	< 0.26	< 0.21	< 0.28	< 0.29
K-40	0.60± 0.28	1.46± 0.31	1.65± 0.34	2.98± 0.40
Mn-54	< 0.024	< 0.015	< 0.026	< 0.011
Fe-59	< 0.048	< 0.034	< 0.047	< 0.05
Co-58	< 0.014	< 0.020	< 0.031	< 0.028
Co-60	< 0.029	< 0.021	< 0.026	< 0.025
Zn-65	< 0.024b	< 0.024	< 0.073	< 0.08
Nb-95	< 0.032	< 0.027	< 0.040	< 0.047
Zr-95	< 0.048	< 0.040	< 0.078	< 0.028
Cs-134	< 0.026	< 0.020	< 0.030	< 0.026
Cs-137	< 0.022	< 0.021	< 0.021	< 0.030
Ba-140[a]	< 0.081	< 0.059	< 0.093	< 0.070
La-140[a]	< 0.011	< 0.017	< 0.007	< 0.020
Ce-144	< 0.12	< 0.042	< 0.092	< 0.12

Location Date Collected	CL-19 10-16-95	CL-105 10-16-95
Be-7	1.19± 0.27	0.39± 0.23
K-40	1.74± 0.37	1.68± 0.40
Mn-54	< 0.020	< 0.025
Fe-59	< 0.04	< 0.07
Co-58	< 0.017	< 0.027
Co-60	< 0.025	< 0.028
Zn-65	< 0.025	< 0.079
Nb-95	< 0.030	< 0.017
Zr-95	< 0.042	< 0.030
Cs-134	< 0.023	< 0.024
Cs-137	< 0.025	< 0.025
Ba-140[a]	< 0.057	< 0.065
La-140[a]	< 0.007	< 0.014
Ce-144	< 0.075	< 0.15

[a] LLD at time of counting.

TABLE E-35

SHORELINE SEDIMENT ACTIVITY - (pCi/g dry)

Location Date Collected	CL-7B 04-06-95	CL-7C 04-06-95	CL-10 04-06-95	CL-19 04-06-95
Gross Alpha	2.62± 1.34	< 3.50	< 0.99	1.56± 1.10
Gross Beta	10.78± 1.40	7.53± 2.33	6.87± 1.93	8.72± 1.39
Sr-90	<0.011	<0.007	<0.011	<0.008
Be-7	< 0.16	< 0.076	< 0.095	< 0.092
K-40	13.54± 0.70	5.84± 0.23	7.30± 0.26	9.08± 0.27
Mn-54	< 0.022	< 0.009	< 0.006	< 0.009
Fe-59	< 0.078	< 0.019	< 0.019	< 0.016
Co-58	< 0.039	< 0.013	< 0.012	< 0.011
Co-60	< 0.026	< 0.009	< 0.009	< 0.010
Zn-65	< 0.098	< 0.029	< 0.037	< 0.034
Nb-95	< 0.037	< 0.012	< 0.012	< 0.013
Zr-95	< 0.037	< 0.013	< 0.016	< 0.008
Cs-134	< 0.047	< 0.013	< 0.015	< 0.015
Cs-137	< 0.031	< 0.007	< 0.004	< 0.009
Ba-140[a]	< 0.060	< 0.030	< 0.018	< 0.024
La-140[a]	< 0.027	< 0.004	< 0.004	< 0.003
Ce-144	< 0.19	< 0.057	< 0.046	< 0.058
Ac-228	0.46± 0.11	0.12± 0.03	0.13± 0.03	0.20± 0.04
Bi-212	< 0.42	< 0.13	0.21± 0.09	< 0.13
Bi-214	0.28± 0.05	0.065± 0.018	0.088± 0.017	0.14± 0.02
Pb-212	0.40± 0.05	0.11± 0.01	0.14± 0.02	0.18± 0.02
Pb-214	0.33± 0.07	0.11± 0.02	0.15± 0.02	0.16± 0.02
Ra-226	< 0.67	0.21± 0.12	0.24± 0.12	0.31± 0.01
Tl-208	0.10± 0.03	0.032± 0.010	0.051± 0.012	0.057± 0.012

[a] LLD at time of counting.

<u>TABLE E-35 (Cont'd)</u>

Location Date Collected	CL-88 04-06-95	CL-89 04-06-95	CL-105 04-06-95
Gross Alpha	< 3.20	2.29± 1.07	< 0.99
Gross Beta	4.63± 2.05	16.45± 2.51	9.98± 1.98
Sr-90	<0.009	<0.008	<0.007
Be-7	< 0.20	0.27± 0.09	< 0.084
K-40	7.34± 0.47	14.89± 0.36	10.94± 0.27
Mn-54	< 0.018	< 0.010	< 0.011
Fe-59	< 0.041	< 0.031	< 0.032
Co-58	< 0.020	< 0.011	< 0.015
Co-60	< 0.025	< 0.014	< 0.011
Zn-65	< 0.073	< 0.049	< 0.033
Nb-95	< 0.028	< 0.022	< 0.012
Zr-95	< 0.064	< 0.015	< 0.018
Cs-134	< 0.031	< 0.022	< 0.014
Cs-137	< 0.021	0.046± 0.013	< 0.011
Ba-140[a]	< 0.061	< 0.029	< 0.030
La-140[a]	< 0.007	< 0.013	< 0.007
Ce-144	< 0.097	< 0.075	< 0.026
Ac-228	0.16± 0.08	0.63± 0.05	0.16± 0.04
Bi-212	< 0.28	0.63± 0.12	0.17± 0.09
Bi-214	0.17± 0.05	0.41± 0.02	0.10± 0.02
Pb-212	0.11± 0.03	0.60± 0.02	0.15± 0.01
Pb-214	0.12± 0.04	0.49± 0.03	0.15± 0.04
Ra-226	< 0.45	1.14± 0.15	0.30± 0.14
Tl-208	0.160± 0.080	0.20± 0.02	0.060± 0.014

[a] LLD at time of counting.

TABLE E-35 (Cont'd)

Location Date Collected	CL-7B 10-16-95	CL-7C 10-16-95	CL-10 10-16-95	CL-19 10-16-95
Gross Alpha	< 5.99	< 5.45	< 3.09	< 5.93
Gross Beta	10.97± 3.30	8.25± 3.27	8.08± 2.17	9.61± 3.25
Sr-90	<0.012	<0.008	<0.009	<0.011
Be-7	0.18± 0.10	< 0.064	< 0.065	< 0.084
K-40	12.43± 0.38	7.86± 0.26	8.57± 0.26	11.02± 0.32
Mn-54	< 0.010	< 0.007	< 0.005	< 0.008
Fe-59	< 0.022	< 0.020	< 0.019	< 0.026
Co-58	< 0.018	< 0.005	< 0.007	< 0.015
Co-60	< 0.013	< 0.007	< 0.006	< 0.007
Zn-65	< 0.050	< 0.032	< 0.031	< 0.039
Nb-95	< 0.021	< 0.004	< 0.009	< 0.009
Zr-95	< 0.017	< 0.008	< 0.008	< 0.020
Cs-134	< 0.024	< 0.013	< 0.015	< 0.019
Cs-137	< 0.010	< 0.006	< 0.006	< 0.008
Ba-140[a]	< 0.037	< 0.024	< 0.020	< 0.028
La-140[a]	< 0.003	< 0.004	< 0.005	< 0.004
Ce-144	< 0.074	< 0.031	< 0.044	< 0.059
Ac-228	0.63± 0.05	0.16± 0.04	0.16± 0.03	0.23± 0.04
Bi-212	0.53± 0.13	< 0.11	0.16± 0.07	0.22± 0.11
Bi-214	0.31± 0.03	0.07± 0.02	0.12± 0.01	0.14± 0.02
Pb-212	0.56± 0.03	0.08± 0.01	0.13± 0.01	0.16± 0.02
Pb-214	0.35± 0.03	0.09± 0.02	0.15± 0.02	0.14± 0.02
Ra-226	0.95± 0.17	< 0.16	0.21± 0.10	0.32± 0.13
Tl-208	0.19± 0.02	0.03± 0.01	0.04± 0.01	0.06± 0.01

[a] LLD at time of counting.

TABLE E-35 (Cont'd)

Location Date Collected	CL-88 10-16-95	CL-89 10-16-95	CL-105 10-16-95
Gross Alpha	4.13± 2.73	7.40± 3.12	< 4.42
Gross Beta	7.47± 2.18	9.04± 2.23	11.72± 3.27
Sr-90	<0.010	<0.008	<0.007
Be-7	< 0.084	0.25± 0.10	< 0.076
K-40	8.20± 0.27	9.36± 0.29	9.78± 0.26
Mn-54	< 0.008	< 0.009	< 0.007
Fe-59	< 0.023	< 0.024	< 0.024
Co-58	< 0.010	< 0.007	< 0.012
Co-60	< 0.009	< 0.009	< 0.006
Zn-65	< 0.037	< 0.041	< 0.029
Nb-95	< 0.008	< 0.020	< 0.005
Zr-95	< 0.015	< 0.020	< 0.007
Cs-134	< 0.016	< 0.018	< 0.014
Cs-137	< 0.008	0.021± 0.008	< 0.005
Ba-140[a]	< 0.018	< 0.024	< 0.017
La-140[a]	< 0.003	< 0.002	< 0.002
Ce-144	< 0.027	< 0.057	< 0.050
Ac-228	0.21± 0.04	0.29± 0.04	0.15± 0.03
Bi-212	0.20± 0.11	0.27± 0.14	0.17± 0.07
Bi-214	0.13± 0.02	0.19± 0.02	0.10± 0.01
Pb-212	0.16± 0.02	0.26± 0.02	0.11± 0.01
Pb-214	0.15± 0.02	0.22± 0.03	0.11± 0.02
Ra-226	0.32± 0.12	0.39± 0.12	0.26± 0.10
Tl-208	0.05± 0.01	0.09± 0.01	0.05± 0.01

[a] LLD at time of counting.

TABLE E-36

BOTTOM SEDIMENT ACTIVITY - (pCi/g dry)

Location Date Collected	CL-7C 04-06-95	CL-10 04-06-95	CL-13A 04-06-95	CL-17 04-06-95
Gross Alpha	4.56± 1.38	15.23± 2.26	< 1.02	4.84± 1.38
Gross Beta	21.58± 2.75	26.77± 1.69	10.51± 2.23	22.20± 2.64
Sr-90	0.010±0.005	0.013±0.006	<0.012	<0.009
Be-7	0.22± 0.12	0.22± 0.12	< 0.073	< 0.12
K-40	18.60± 0.41	18.90± 0.41	10.81± 0.27	18.55± 0.36
Mn-54	< 0.014	< 0.015	< 0.009	< 0.013
Fe-59	< 0.034	< 0.034	< 0.021	< 0.033
Co-58	< 0.021	< 0.020	< 0.009	< 0.008
Co-60	< 0.016b	< 0.013	< 0.011	< 0.013
Zn-65	< 0.059	< 0.064	< 0.034	< 0.048
Nb-95	< 0.028	< 0.028	< 0.014	< 0.023
Zr-95	< 0.029	< 0.027	< 0.014	< 0.021
Cs-134	< 0.032	< 0.032	< 0.015	< 0.027
Cs-137	0.17± 0.02	0.32± 0.03	< 0.009	0.086± 0.013
Ba-140[a]	< 0.023	< 0.051	< 0.025	< 0.031
La-140[a]	< 0.015	< 0.017	< 0.003	< 0.013
Ce-144	< 0.11	< 0.13	< 0.052	< 0.084
Ac-228	1.05± 0.06	1.23± 0.07	0.27± 0.03	0.88± 0.05
Bi-212	0.98± 0.20	1.31± 0.21	0.28± 0.10	0.87± 0.15
Bi-214	0.80± 0.03	0.69± 0.03	0.20± 0.02	0.63± 0.03
Pb-212	1.07± 0.03	1.23± 0.03	0.27± 0.01	0.92± 0.03
Pb-214	0.88± 0.04	0.88± 0.04	0.22± 0.02	0.69± 0.03
Ra-226	1.84± 0.28	2.03± 0.02	0.32± 0.11	1.47± 0.19
Tl-208	0.34± 0.02	0.390± 0.020	0.089± 0.010	0.280± 0.190

[a]LLD at time of counting.

TABLE E-36 (Cont'd)

Location Date Collected	CL-19 10-16-95	CL-89 10-16-95	CL-105 10-16-95
Gross Alpha	5.76± 1.76	< 1.24	15.91± 2.35
Gross Beta	11.09± 1.42	9.46± 2.12	30.01± 1.80
Sr-90	<0.007	<0.009	0.015±0.006
Be-7	0.32± 0.17	< 0.18	< 0.37
K-40	13.24± 0.36	8.93± 0.48	20.35± 0.94
Mn-54	< 0.015	< 0.018	< 0.050
Fe-59	< 0.022	< 0.034	< 0.080
Co-58	< 0.010	< 0.013	< 0.021
Co-60	< 0.017	< 0.018	< 0.031
Zn-65	< 0.039	< 0.063	< 0.16
Nb-95	< 0.019	< 0.029	< 0.067
Zr-95	< 0.031	< 0.016	< 0.14
Cs-134	< 0.021	< 0.029	< 0.073
Cs-137	0.052± 0.019	< 0.022	0.36± 0.07
Ba-140[a]	< 0.046	< 0.068	< 0.14
La-140[a]	< 0.014	< 0.013	< 0.036
Ce-144	< 0.089	< 0.14	< 0.28
Ac-228	0.50± 0.05	0.27± 0.07	1.32± 0.16
Bi-212	0.49± 0.10	< 0.23	1.35± 0.49
Bi-214	0.27± 0.02	0.18± 0.03	0.59± 0.08
Pb-212	0.44± 0.02	0.29± 0.03	1.28± 0.07
Pb-214	0.34± 0.04	0.22± 0.05	0.94± 0.09
Ra-226	0.64± 0.19	< 0.42	1.86± 0.07
Tl-208	0.15± 0.02	0.091± 0.025	0.45± 0.06

[a]LLD at time of counting.

TABLE E-36 (Cont'd)

Location Date Collected	CL-7C 10-16-95	CL-7C 10-16-95	CL-10 10-16-95	CL-13A 10-16-95	CL-17 10-16-95
Gross Alpha	8.12± 4.91	15.37± 5.84	15.94± 4.41	< 3.76	9.08± 5.10
Gross Beta	23.35± 4.30	26.34± 4.07	23.62± 2.87	9.01± 2.36	25.49± 4.32
Sr-90	0.015± 0.006	0.025± 0.012	<0.011	<0.009	0.012± 0.005
Be-7	0.27± 0.12	0.48± 0.18	< 0.19	< 0.09	< 0.12
K-40	18.03± 0.45	20.06± 0.57	18.40± 0.28	9.74± 0.29	16.34± 0.43
Mn-54	< 0.022	< 0.017	< 0.015	< 0.008	< 0.013
Fe-59	< 0.030	< 0.035	< 0.024	< 0.016	< 0.038
Co-58	< 0.010	< 0.029	< 0.021	< 0.004	< 0.009
Co-60	< 0.016	< 0.016	< 0.015	< 0.076	< 0.010
Zn-65	< 0.065	< 0.091	< 0.064	< 0.040	< 0.063
Nb-95	< 0.024	< 0.047	< 0.045	< 0.011	< 0.027
Zr-95	< 0.031	< 0.023	< 0.038	< 0.015	< 0.024
Cs-134	< 0.017	< 0.048	< 0.036	< 0.017	< 0.032
Cs-137	0.13± 0.02	0.22± 0.03	0.31± 0.01	< 0.008	0.094± 0.015
Ba-140[a]	< 0.034	< 0.037	< 0.031	< 0.028	< 0.046
La-140[a]	< 0.018	< 0.012	< 0.016	< 0.004	< 0.007
Ce-144	< 0.11	< 0.12	< 0.110	< 0.065	< 0.059
Ac-228	0.99± 0.06	1.34± 0.09	1.19± 0.05	0.26± 0.03	0.83± 0.06
Bi-212	0.77± 0.24	1.20± 0.21	1.33± 0.16	0.15± 0.09	0.79± 0.26
Bi-214	0.60± 0.03	0.96± 0.04	0.96± 0.02	0.13± 0.02	0.47± 0.03
Pb-212	0.92± 0.03	1.25± 0.05	1.30± 0.02	0.19± 0.02	0.80± 0.03
Pb-214	0.73± 0.04	1.18± 0.06	1.08± 0.03	0.20± 0.02	0.65± 0.05
Ra-226	1.49± 0.26	2.00± 0.30	2.23± 0.16	0.31± 0.12	1.23± 0.21
Tl-208	0.30± 0.02	0.42± 0.03	0.40± 0.02	0.07± 0.01	0.27± 0.02

[a]LLD at time of counting.

TABLE E-36 (Cont'd)

Location	CL-19	CL-89	CL-105
Date Collected	10-16-95	10-16-95	10-16-95
Gross Alpha	< 4.76	< 5.47	12.03± 5.80
Gross Beta	11.38± 3.21	10.22± 3.27	23.36± 4.21
Sr-90	<0.013	<0.008	0.020± 0.008
Be-7	< 0.11	< 0.21	< 0.42
K-40	13.01± 0.38	13.49± 0.51	22.72± 0.72
Mn-54	< 0.012	< 0.018	< 0.032
Fe-59	< 0.014	< 0.040	< 0.051
Co-58	< 0.010	< 0.030	< 0.038
Co-60	< 0.011	< 0.027	< 0.022
Zn-65	< 0.050	< 0.063	< 0.13
Nb-95	< 0.008	< 0.020	< 0.076
Zr-95	< 0.022	< 0.046	< 0.041
Cs-134	< 0.022	< 0.034	< 0.065
Cs-137	< 0.011	< 0.022	0.41± 0.04
Ba-140[a]	< 0.032	< 0.068	< 0.084
La-140[a]	< 0.003	< 0.014	< 0.032
Ce-144	< 0.075	< 0.11	< 0.18
Ac-228	0.33± 0.05	0.47± 0.07	1.47± 0.14
Bi-212	< 0.15	0.42± 0.02	1.35± 0.34
Bi-214	0.21± 0.02	0.32± 0.03	1.38± 0.72
Pb-212	0.24± 0.02	0.46± 0.03	1.67± 0.06
Pb-214	0.22± 0.03	0.37± 0.04	1.51± 0.08
Ra-226	0.57± 0.15	0.72± 0.20	2.71± 0.40
Tl-208	0.08± 0.02	0.16± 0.02	0.56± 0.04

[a]LLD at time of counting.

TABLE E-37

SOIL ACTIVITY - (pCi/g dry)

Location	CL-16C
Date Collected	11-08-95
Gross Alpha	12.03± 4.20
Gross Beta	21.86± 3.02
Be-7	< 0.18
K-40	17.71± 0.42
Mn-54	< 0.015
Fe-59	< 0.033
Co-58	< 0.017
Co-60	< 0.019
Zn-65	< 0.070
Nb-95	< 0.042
Zr-95	< 0.036
Cs-134	< 0.022
Cs-137	< 0.018
Ba-140[a]	< 0.056
La-140[a]	< 0.012
Ce-144	< 0.11
Ac-228	0.79± 0.07
Bi-212	0.50± 0.21
Bi-214	0.56± 0.04
Pb-212	0.81± 0.03
Pb-214	0.59± 0.04
Ra-226	1.34± 0.19
Tl-208	0.26± 0.02

[a] LLD at time of counting

FOR MORE INFORMATION, CALL OR WRITE

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ILLINOIS POWER