AmerGen
An Exelon/British Energy Company

Clinton Power Station
R.R. 3 Box 228
Clinton, IL 61727-9351
Phone: 217 935-8881

U-603551
1A.120

April 29, 2002

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Clinton Power Station
Facility Operating License No. NPF-62
NRC Docket No. 50-461

Subject: Annual Radiological Environmental Operating Report

AmerGen Energy Company, LLC (AmerGen) is submitting the 2001 Annual Radiological Environmental Operating Report for Clinton Power Station. This submittal is provided in accordance with the requirements of section 5.6.2 of the Clinton Power Station Technical Specifications. This report covers the period of January 1, 2001 through December 31, 2001.

Respectfully,

Michael J. Pacilio
Plant Manager
Clinton Power Station

RSF/

Attachment

cc: Regional Administrator - NRC Region III
NRC Senior Resident Inspector – Clinton Power Station
Office of Nuclear Facility Safety - Illinois Department of Nuclear Safety

IE25

U-603551

SUBJECT: Annual Radiological Environmental Operating Report

bcc: J. M. Heffley, V-275
M. J. Pacilio, T-31A
J. J. Madden, T-31Q
J. D. Willams, T-31A
Clinton Power Station Project Manager – NRR
Director – Licensing, Mid-West Regional Operating Group
Manager – Licensing, Clinton Power Station (MWROG)
Document Control Desk Licensing (Hard Copy)
Document Control Desk Licensing (Electronic Copy)
NSRB Coordinator, T-31J

AmerGen
An Exelon / British Energy Company

Clinton Power Station 2001 Annual Radiological Environmental Operating Report

01 January 2001 – 31 December 2001

ANNUAL RADIOACTIVE ENVIRONMENTAL OPERATING REPORT

FOR THE

CLINTON POWER STATION

Prepared by:

Robert J. Campbell
Chemistry Department

TABLE OF CONTENTS

ITEM			PAGE
LIST OF TABLES			4
LIST OF FIGURES			5
I.	**EXECUTIVE SUMMARY**		6
II.	**INTRODUCTION**		
	A.	Characteristics of Radiation	7
	B.	Sources of Radiation Exposure	8
	C.	Description of the Clinton Power Station	12
	D.	Nuclear Reactor Operations	13
	E.	Containment of Radioactivity	16
	F.	Sources of Radioactive Effluents	17
	G.	Radioactive Waste Processing	17
III.	**RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM**		19
	A.	Program Description	19
	B.	Direct Radiation Monitoring	31
	C.	Atmospheric Monitoring	33
	D.	Aquatic Monitoring	37
		° Fish	37
		° Shoreline Sediments	38
	E.	Terrestrial Monitoring	38
		° Milk	38
		° Grass	39
		° Vegetables	39
	F.	Water Monitoring	39
		° Drinking Water	40
		° Surface Water	40
		° Well Water	41
	G.	Quality Assurance Program	43
	H.	Changes to the REMP During 2001	43
IV.	**2001 ANNUAL LAND USE CENSUS**		44
	Summary of Changes		47
V.	**LIST OF REFERENCES**		48

TABLE OF CONTENTS (continued)

ITEM			PAGE
VI.	**APPENDICES**		
	A.	2001 Radiological Environmental Monitoring Program Quality Control Check Results	50
	B.	REMP Annual Summary	72
		1. Sampling and Analysis Frequency Summary	73
		2. Radiological Environmental Monitoring Program Annual Summary	76
	C.	Glossary	85
	D.	Exceptions to the REMP during 2001	88
	E.	CPS Radiological Environmental Monitoring Results during 2001	90

LIST OF TABLES

TABLE	SUBJECT	PAGE
1	Common Sources of Radiation	11
2-A	CPS Radiological Monitoring Program Sampling Locations (TLD Sites)	27
2-B	CPS Radiological Monitoring Program Sampling Locations	28
3-A	CPS REMP Reporting Levels for Radioactivity Concentrations in Environmental Samples	29
3-B	Detection Capabilities for Environmental Sample Analysis Lower Limit of Detection (LLD)	29
4	Average Quarterly TLD Results	32
5	Annual Average Gross Beta Concentrations in Air Particulates	35
6	Average Monthly Gross Beta Concentrations in Air Particulates	35
7	Average Gross Beta Concentrations in Drinking, Surface and Well Water	42
8	Annual Land Use Census Summary Results	46

LIST OF FIGURES

FIGURE	SUBJECT	PAGE
1	Dose Contributions to the U. S. Population from Principal Sources of Radiation Exposure	11
2	Clinton Power Station Basic Plant Schematic	15
3	Potential Exposure Pathways of Man Due to Releases of Radioactive Material to the Environment	21
4	REMP Sample Locations within 1 Mile	23
5	REMP Sample Locations from 1 - 2 Miles	24
6	REMP Sample Locations from 2 - 5 Miles	25
7	REMP Sample Locations Greater than 5 Miles	26
8	Direct Radiation Comparison	32
9	Air Particulate Gross Beta Activity Comparison	36

EXECUTIVE SUMMARY

I. EXECUTIVE SUMMARY

This report describes the Annual Radiological Environmental Monitoring Program (REMP) conducted near the Clinton Power Station (CPS) during the 2001 calendar year. The REMP was performed as required by the CPS Operating License issued by the United States Nuclear Regulatory Commission (NRC). 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 2001, one-thousand-four-hundred-sixty-seven (1,467) environmental samples were collected. These samples represented direct radiation; atmospheric, terrestrial, and aquatic environments along with Clinton Lake surface water and public drinking water samples. Subsequently, one-thousand-eight-hundred-nine (1,809) 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 Pre-Operational levels found prior to unit start-up. The CPS Pre-Operational REMP Report documented natural background radionuclides and man-made radioactivity in the environment surrounding CPS.

Radiological environmental measurements taken during 2001 demonstrated that operational and engineered controls on the radioactive effluents released from the plant functioned as they were designed. Any radioactivity that was detected in the environment at Indicator Locations was appropriately compared with both the measurements at Control Locations and Pre-Operational results.

There were zero (Ø) radioactive liquid releases from CPS during 2001. Releases of gaseous radioactive materials were accurately measured in plant effluents. There were no gaseous releases that even approached the limits specified in the CPS Offsite Dose Calculation Manual (ODCM). The highest calculated offsite dose received by a member of the public due to the release of gaseous effluents from Clinton Power Station was less than 0.003 mRem.

All comparisons among Operational Data and Pre-Operational Data showed that during 2001, the operation of Clinton Power Station had no measurable effects upon the surrounding environment.

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 will have on the general public.

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". Gamma rays and X-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 an alpha or beta particle, or has no charge, like a neutron.

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 millions of years. Radionuclides may decay directly into stable elements or may undergo a series of decays until they ultimately reach a stable element.

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

TYPICAL NATURALLY OCCURRING RADIONUCLIDES	TYPICAL 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. For example, a one-curie radioactive source undergoes 2.2 trillion disintegrations per minute. When compared against nuclear power plant effluents and environmental radioactivity however, this is a very large unit of measure. Therefore, two sub-fractional units - the microcurie and the picocurie - are more commonly used terms.

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 (μCi) 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 an analogy with distances. A picocurie would be the width of a pencil mark while a curie would be the equivalent of one-hundred (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 over a half ton - 1,019 pounds - to equate to an activity of one curie. Whereas Iodine-131 (I^{131}) with a half-life of 8.04 days requires 0.0000000176 pounds to equate to 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 (Sr^{90})
Kidney	Uranium-235 (U^{235})
Thyroid	Iodine-131 (I^{131})
Muscle and Liver Tissue	Cesium-137 (Cs^{137})
Gastrointestinal Tract	Cobalt-60 (Co^{60})

For example, radio-iodine selectively concentrates in the thyroid gland, whereas radio-cesium collects in muscle and liver tissue and radio-strontium collect in mineralized bone. The quantity and the duration of time that the radionuclide remains in the body also influence the total dose to organs by a given radionuclide. Owing to radioactive decay and human metabolism factors, some radionuclides stay in the body for very short periods of time while others remain for years.

The amount of radiation dose that an individual receives is expressed in Rem. Since human exposure to radiation typically involves very small exposures, the millirem (mRem) is the unit most commonly used. One millirem is equal to one thousandth of a 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 body - 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 daughter products'. These new products - which are solid particles not gases - can adhere to surfaces such as dust particles contained in the air.

Concentrations of radon in the air vary and are affected by concentrations of uranium and thorium in the soil as well as altitude, soil porosity, temperature, pressure, soil moisture, rainfall, snow cover, atmospheric conditions and the time of the season. Radon can move through cracks and openings into basements of buildings and become trapped in small air volumes 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 a high-energy alpha radiation dose to the lung lining. Table 1 shows the average annual effective dose due to radon.

About three-hundred (300) 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 stays 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 while milk contains measurable amounts of Potassium-40. Sources of natural radiation and their average contributing radiation doses are also 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 can also vary widely from location to location. The average individual in the United States receives approximately three-hundred (300) mRem per year, just from naturally occurring background radiation sources.

In some areas of the United States, the dose from natural radiation is significantly higher. Residents of Colorado – five-thousand (5,000) feet above sea level – will receive additional dose due to the increase of cosmic and terrestrial radiation levels. In fact, for every one-thousand (1,000) feet in elevation above sea level, an individual will receive an additional one (1) 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 approximately fifty-three (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	**364**

PERCENTAGE OF CONTRIBUTION

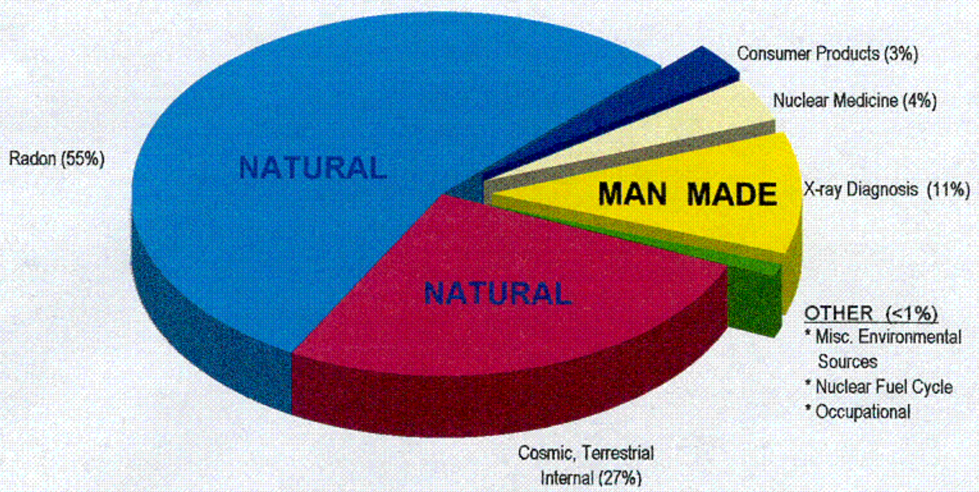


FIGURE 1: DOSE CONTRIBUTIONS TO THE U.S. POPULATION FROM PRINCIPAL SOURCES OF RADIATION EXPOSURE

C01

Smaller doses from man-made sources come from consumer products – such as televisions, smoke detectors, and fertilizers – as well as fallout from prior nuclear weapons testing, the 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 a nuclear weapon. 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 (200) radionuclides produced in the nuclear weapon detonation process with a number of these detected as fallout. The radionuclides found in fallout that produce the majority 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 (CPS) is located in Harp Township, DeWitt County, Illinois. It is approximately six (6) miles east of Clinton, Illinois.

The station – including the V-shaped cooling lake – coupled with the surrounding AmerGen Energy Company, LLC owned land encloses approximately 13,730 acres. This includes the 4,895 acre, man-made cooling lake and about 452 acres of property not owned by AmerGen. The plant is situated 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 aforementioned 13,730 acres lie within Wilson, Rutledge, DeWitt, Creek, Nixon and Santa Anna Township[s].

The cooling lake was formed by constructing an earthen dam near the confluence of Salt Creek and at the North Fork of Salt Creek. The resulting lake has an average depth of 15.6 feet which includes an ultimate heat sink of approximately 590 acre-feet. The ultimate heat sink provides for a sufficient water volume and cooling capacity for approximately thirty (30) days of operation without any makeup water.

Through arrangements made 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 11,000 people per day during peak usage periods. The outflow from Clinton Lake falls into Salt Creek and then flows in a westerly direction for about fifty-six (56) miles before joining in with the Sangamon River. The Sangamon River drains into the Illinois River that enters the Mississippi River near Grafton, Illinois. The closest use of downstream water for drinking purposes is approximately 242 river miles downstream from Clinton Lake at Alton, Illinois as verified from the Illinois Environmental Protection Agency Public Water Service. Although some farms throughout the Salt Creek drainage area use irrigation water downstream of Clinton Lake, this irrigation water is drawn from wells and not directly from the waters of Salt Creek.

Approximately 810,000 individuals live within fifty (50) miles of the Clinton Power Station. Over half are located in the major metropolitan centers of Bloomington - Normal which is located about twenty-three (23) miles to the north northwest, Champaign - Urbana which is located about thirty-one (31) miles to the east, Decatur which is located about twenty-two (22) miles to the south southwest and Springfield which is located about forty-eight (48) miles to the west southwest. The nearest city is Clinton, the county seat of DeWitt County. The estimated population of Clinton is about 8,000 residents. Outside of the urban areas, most of the land within fifty (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'. During 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, more radiation, more heat and more neutrons are produced and a sustained reaction occurs. The heat produced is extracted from the fuel to produce steam, which subsequently 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. Stable atoms in the materials that make up the components and structures of the reactor may absorb neutrons that are not absorbed by the uranium fuel. 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-137 (Cs^{137})	Cobalt-60 (Co^{60})
Barium-140 (Ba^{140})	Manganese-54 (Mn^{54})
Cerium-144 (Ce^{144})	Iron-59 (Fe^{59})
Strontium-90 (Sr^{90})	Zinc-65 (Zn^{65})

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 water systems. In this type of reactor, the fuel is formed into small ceramic pellets that are loaded into sealed fuel rods.

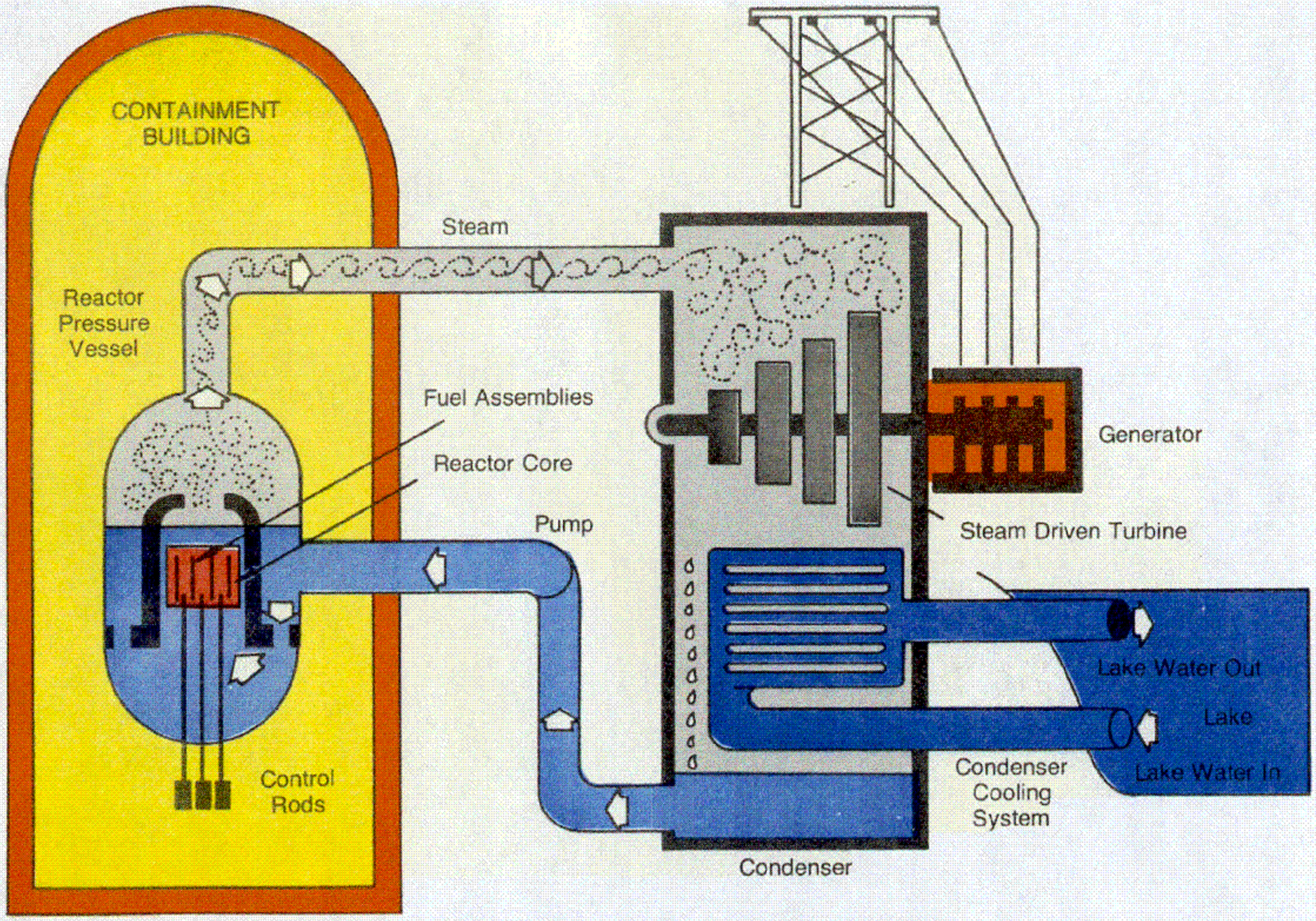


FIGURE 2: CLINTON POWER STATION BASIC PLANT SCHEMATIC

C02

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

The voids 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 water pumps are used to force the water to circulate through the fuel bundles to assure even cooling and heat removal from the fuel rods. Some of the water that absorbs heat from the fuel rods is changed to steam. The steam is used to drive a turbine that is coupled to a generator, thereby completing the conversion of nuclear energy released during fission into electricity.

After the steam passes through the turbine, it is condensed back into 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 mix 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 coolant system although small leaks from the primary system may occur.

E. CONTAINMENT OF RADIOACTIVITY

During normal operating conditions, essentially all of the radioactivity is contained within the first of several barriers - that collectively - prevent radioactivity from escaping into 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 (70) foot high vessel with steel walls ranging from four (4) to seven (7) inches thick that encases 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 a steel-lined, four (4) 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 operations 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.

Demineralizers from the water purification systems remove many soluble fission and activation products such as radioactive iodines, strontiums, cobalts and cesiums. The noble gas fission products, activated atmospheric gases introduced with reactor feedwater and some of the volatile fission products such as iodine and bromine, carry over from the reactor pressure vessel to the condenser.

The steam jet air ejectors remove the gases from the condenser and transfer them to the off-gas treatment system. Within the off-gas treatment system, these gases are held up by adsorption on specially treated charcoal beds to allow 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, Rad Waste 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 wastewater. These represent the principal sources of liquid effluents.

Information about radioactive effluents can be found in the Annual Radioactive Effluent Release Report. This report contains a detailed description of all radioactive releases from CPS and the resulting radiation doses for the reporting period.

G. RADIOACTIVE WASTE PROCESSING

In a normal operating nuclear power plant, radioactive liquid and gaseous wastes are collected, stored and then processed through treatment systems to remove or reduce most of their radioactivity (excluding tritium) prior to reuse within the plant or discharged to the environment. These processing systems are required by the Clinton Power Station (CPS) Offsite Dose Calculation Manual (ODCM) to be installed and operable to help ensure all releases of radioactive liquid and gaseous effluents are **A**s **L**ow **A**s **R**easonably **A**chievable (ALARA). As a matter of commitment, CPS strives to be a zero (Ø) liquid release plant and was able to accomplish that commitment throughout 2001.

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 may be discharged into the plant cooling water stream that varies from approximately 5,000 gallons per minute - when the unit is shutdown - to 567,000 gallons per minute when the unit is at full power. If a planned release were to occur, liquid effluents would be thoroughly mixed with - and diluted by - the plant cooling water as it traverses down a 3.4 mile discharge canal before entering Clinton Lake east of DeWitt County Road 14.

The Clinton Power Station Offsite Dose Calculation Manual requires that liquid effluents will not have a higher concentration of any radioisotope than which is established for continuous exposure to the general public. This requirement is satisfied at the point in which the liquid effluent is first introduced to the cooling water flow. Thus, this additional dilution – which occurs along the 3.4 mile cooling water canal - further reduces the original concentration[s] of radioisotopes by 1/73 (at minimum flow during unit shutdown) and by 1/1890 (at maximum flow during unit operation) prior to the water entering Clinton Lake.

The concentrated radioactive solids captured from the liquid waste treatment system are processed and temporarily stored on-site until shipped off-site for disposal at a licensed low-level waste disposal facility.

The gaseous effluents from the main condenser are held up in the off-gas charcoal beds for a minimum of forty-six (46) hours. With most of the radionuclides present having a radioactive half-life of less than eight (8) hours, this hold up process allows for their radioactive decay. If the gaseous effluents from the ventilation exhaust system for the Containment Building and Secondary Containment structure exceed conservatively established set points, these effluents are processed through charcoal beds and High Efficiency Particulate Air (HEPA) filters within the Standby Gas Treatment System before being released to the environment.

The combination of HEPA filters and charcoal bed filtration is rated to be 95% efficient for removing iodines and greater than 99% efficient for removing any particulate material that is larger than one micron (one millionth of one inch) in diameter.

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 (REMP) 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 REMP is an extensive program of sampling, measuring and analyzing that was instituted to monitor the radiological impact of reactor operation[s] on the environment. Objectives of the program include the following:

- identification, measurement and evaluation of existing radionuclides in the environs of the Clinton Power Station and fluctuations in radioactivity levels that may occur
- evaluation of the measurements to determine the impact of Clinton Power Station operations relative to 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 (2) phases, Pre-Operational (Pre-Op) and Operational.

The Pre-Operational portion of the program was initiated in May 1980 and was completed on 27 February 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[s]. The operational phase implements confirmatory measurements to verify that the in-station controls for the release of radioactive material are functioning as they were designed to.

AmerGen Energy Company, LLC currently maintains a contract with Environmental Inc. Midwest Laboratory, for the analysis of all radiological environmental samples. Environmental Inc. is located in Northbrook, Illinois. Samples are currently collected by AmerGen Energy Company personnel and then shipped to the Environmental, Inc. laboratory for analysis. After analysis, environmental samples are saved at the laboratory for a specified period of time in case an additional follow up analysis is required. Analytical results are then reported back monthly to the ODCM Program Owner.

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 the public. The "important pathways" selected are based primarily on how radionuclides move through the environment that will eventually expose the public – taking into consideration - man's use of the environment. The scope of the program includes the monitoring of five (5) environmental elements:

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

Each pathway is monitored at "Indicator" and "Control" Locations. Indicator Locations are generally within a ten (10) mile radius of the station that is expected to mimic station effects, if any exist. Control Locations are located greater than ten (10) miles from the plant - far enough away – so as not to be influenced by unit operations. These control samples provide the basis by which to measure any fluctuations in radioactivity from Indicator Locations relative to natural phenomena and fallout. Thus any increase in radioactive material concentration from an Indicator Location may be - due in part - to unit operations.

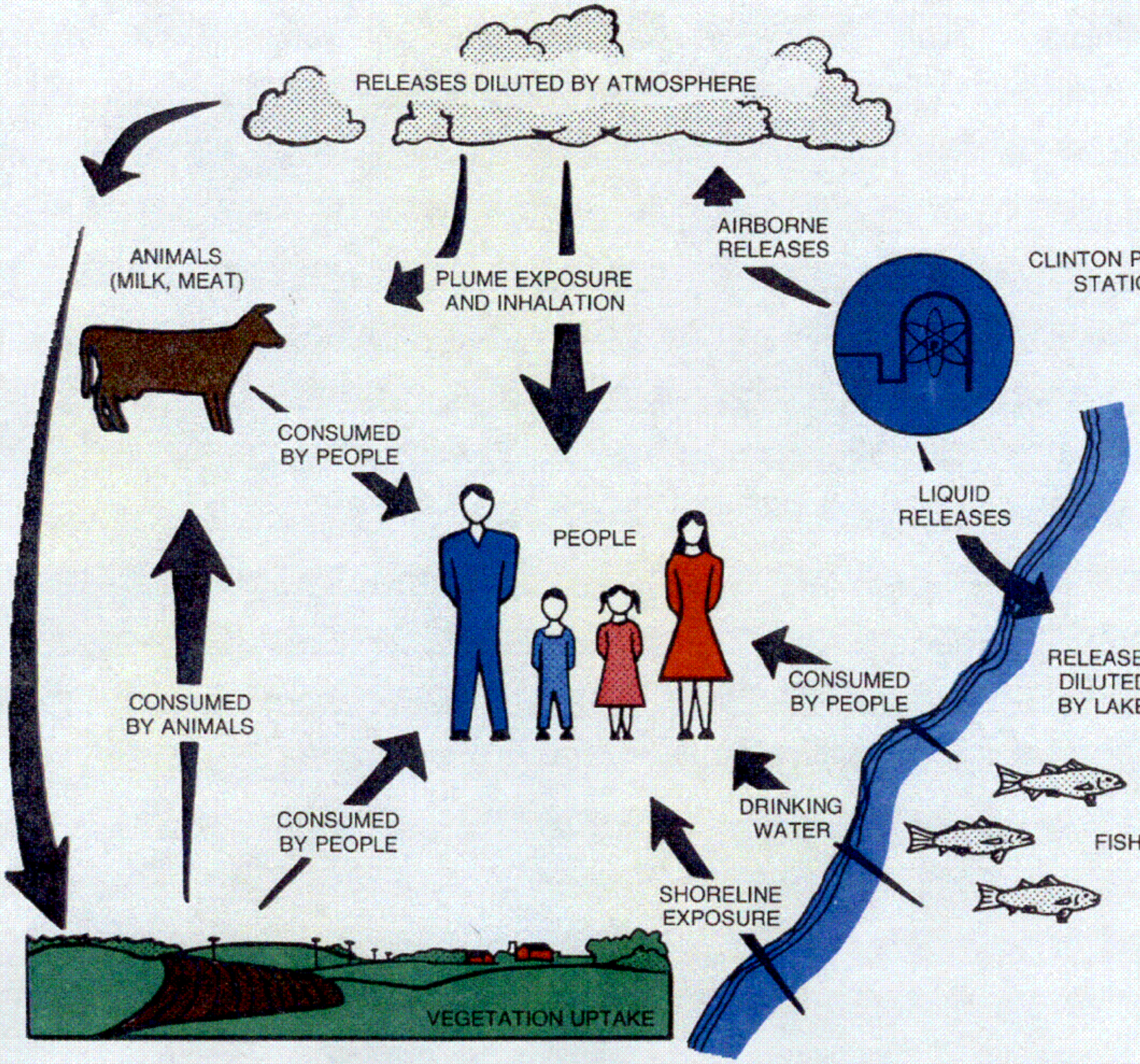


FIGURE 3: POTENTIAL EXPOSURE PATHWAYS OF MAN DUE TO RELEASES OF RADIOACTIVE MATERIAL TO THE ENVIRONMENT

C03

Sampling locations were established by considering site meteorology, area population distribution, site hydrology, and land use characteristics of the local area. These locations were selected primarily on the basis of where the highest predicted environmental concentrations would occur.

Locations of sampling stations are shown on maps in Figures 4 through 7. Table[s] 2-A and 2-B provide information on sample location, media sampled at each of these location[s], and a brief description of each location where samples were taken. The location is listed according to distance (in miles) and the meteorological compass sector in relationship to the Station Heating, Ventilation, and Air Conditioning (HVAC) Stack.

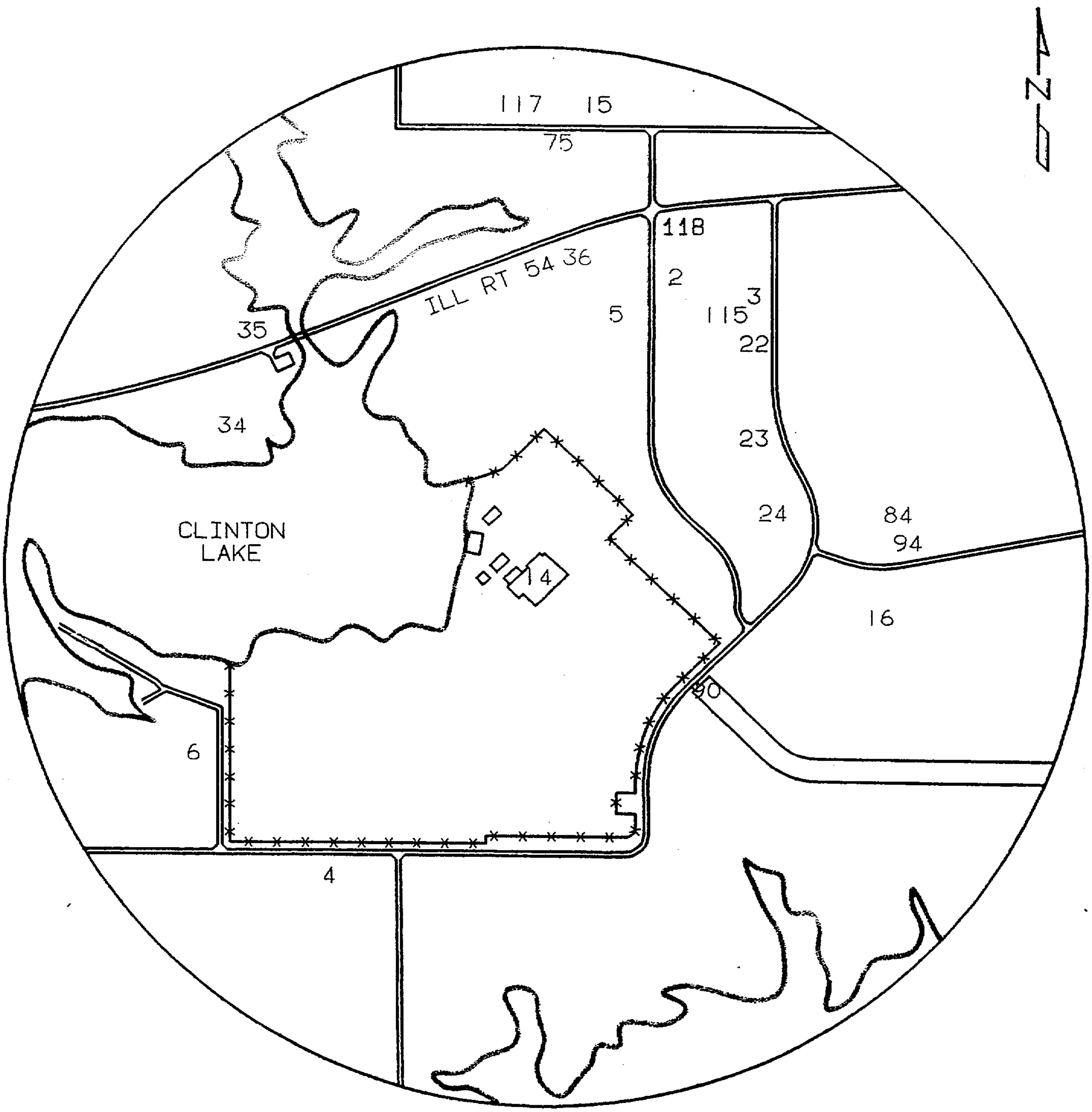


Figure 4 REMP Sample Locations within 1 Mile

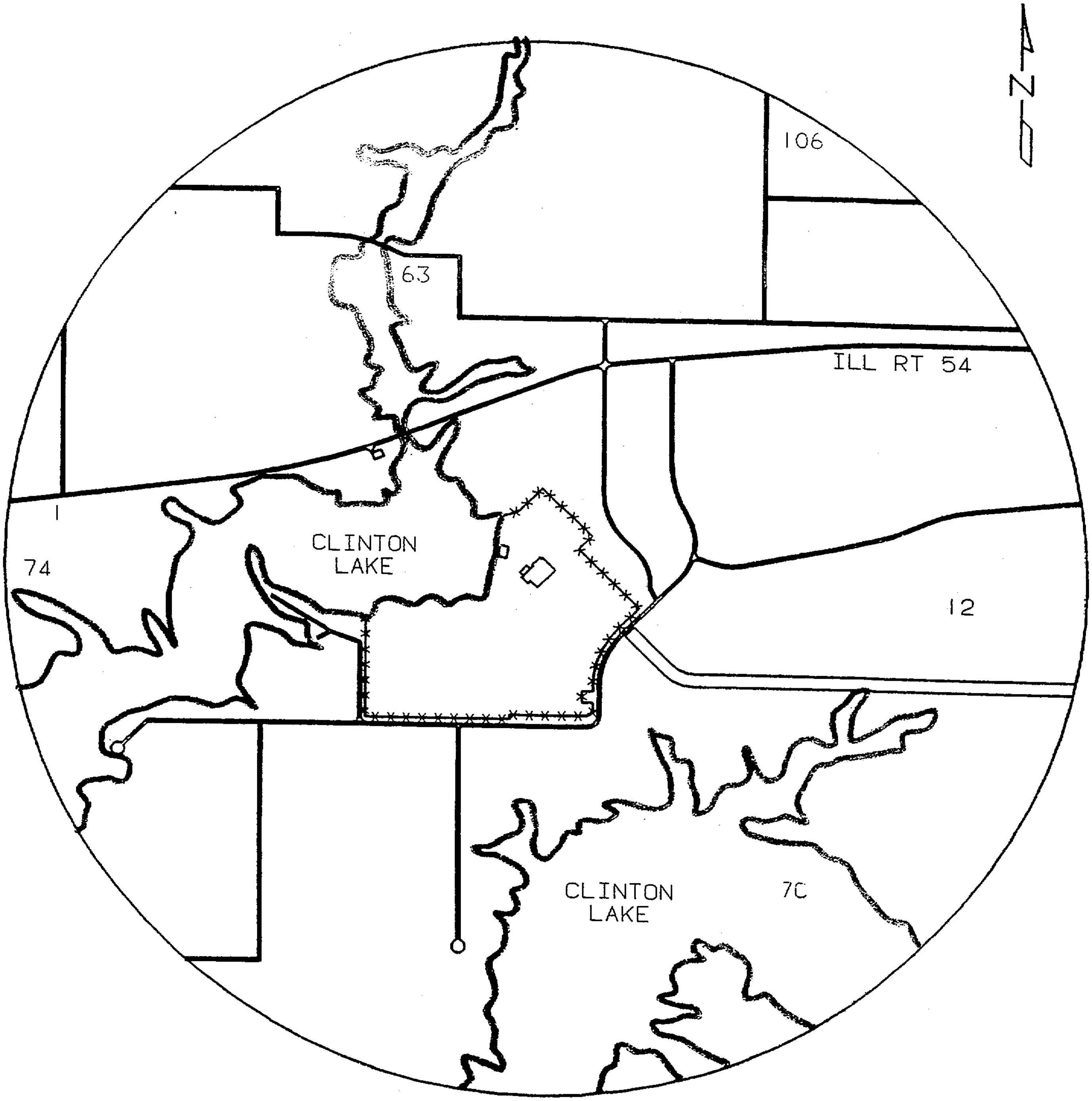


Figure 5 REMP Sample Locations within 1 – 2 Miles

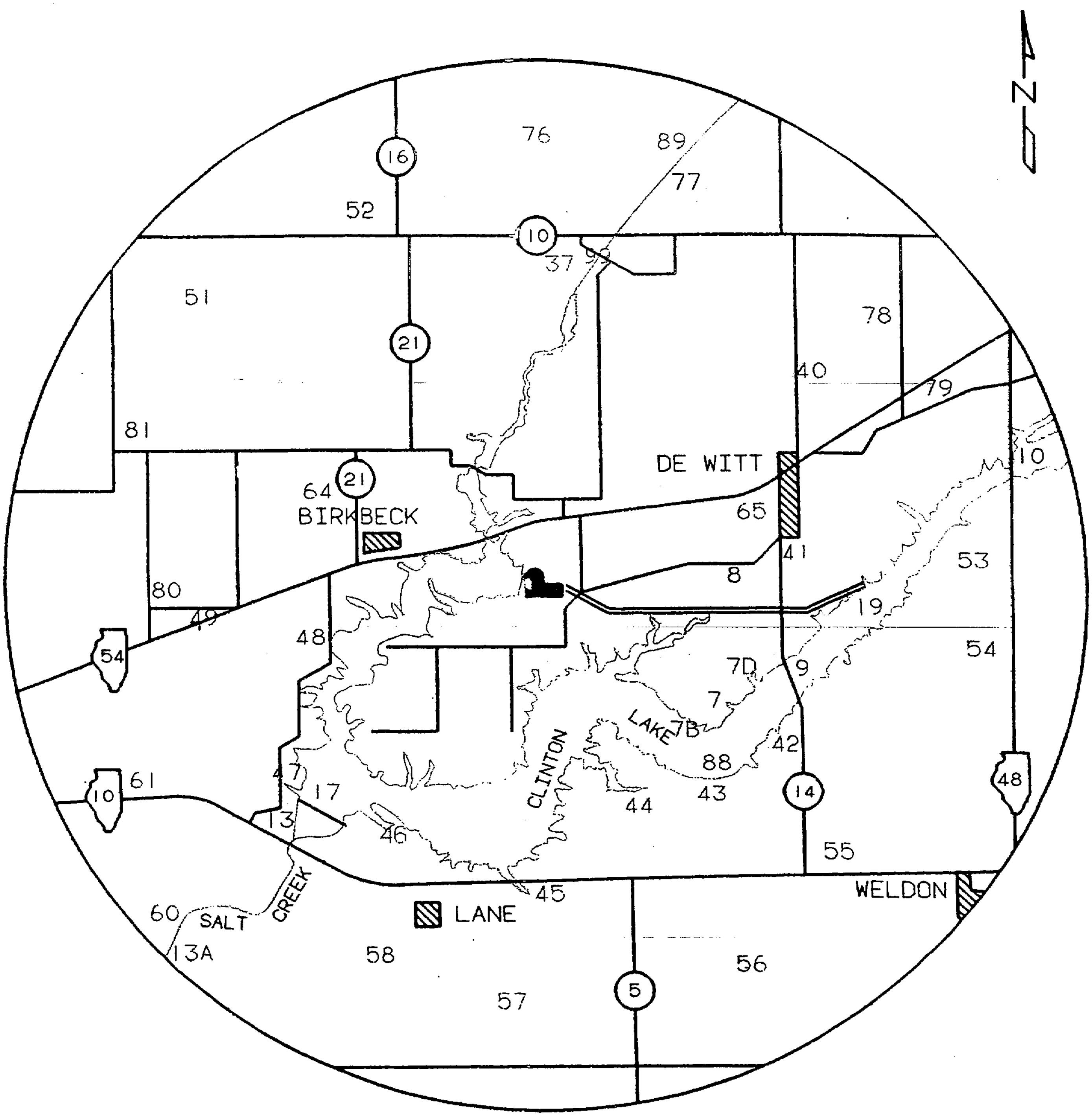


Figure 6 REMP Sample Locations within 2 – 5 Miles

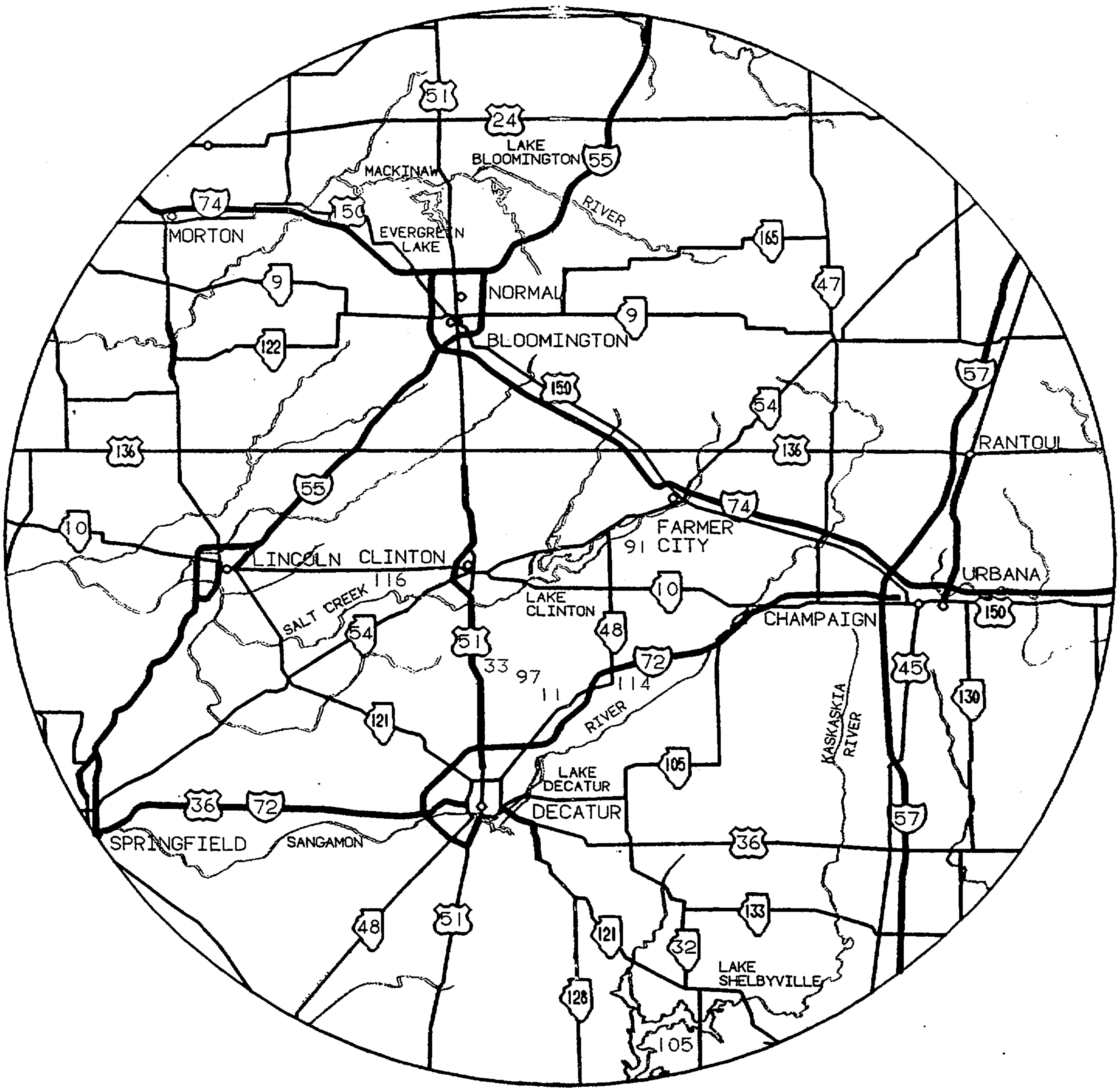


Figure 7 REMP Sample Locations greater than 5 Miles

TABLE 2-A

CPS RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SAMPLING LOCATIONS

TLD Sites

Station Code	Description	Sector	Distance (miles)	Station Code	Description	Sector	Distance (miles)
CL-1	Inner ring	W	1.8	CL-51	Outer Ring	NW	4.4
CL-2	Supplemental Control	NNE	0.7	CL-52	Outer Ring	NNW	4.3
CL-3	Supplemental Control	NE	0.7	CL-53	Outer Ring	E	4.3
CL-4	Supplemental Control	SW	0.8	CL-54	Outer Ring	ESE	4.6
CL-5	Inner Ring	NNE	0.7	CL-55	Outer Ring	SE	4.1
CL-6	Supplemental Control	WSW	0.8	CL-56	Outer Ring	SSE	4.1
CL-7	Supplemental Control	SE	2.3	CL-57	Outer Ring	S	4.6
CL-8	Supplemental Control	E	2.2	CL-58	Outer Ring	SSW	4.3
CL-11	Control	S	16	CL-60	Outer Ring	SW	4.5
CL-15	Supplemental Control	N	0.9	CL-61	Outer Ring	WSW	4.5
CL-22	Inner Ring	NE	0.6	CL-63	Inner Ring	NNW	1.3
CL-23	Inner Ring	ENE	0.5	CL-64	Special Interest	WNW	2.1
CL-24	Inner Ring	E	0.5	CL-65	Special Interest	ENE	2.6
CL-33	Supplemental Control	SW	11.7	CL-74	Special Interest	W	1.9
CL-34	Inner Ring	WNW	0.8	CL-75	Special Interest	N	0.9
CL-35	Inner Ring	NW	0.7	CL-76	Outer Ring	N	4.6
CL-36	Inner Ring	N	0.6	CL-77	Outer Ring	NNE	4.5
CL-37	Special Interest	N	3.4	CL-78	Outer Ring	NE	4.8
CL-41	Special Interest	E	2.4	CL-79	Outer Ring	ENE	4.5
CL-42	Inner Ring	ESE	2.8	CL-80	Outer Ring	W	4.1
CL-43	Inner Ring	SE	2.8	CL-81	Outer Ring	WNW	4.5
CL-44	Inner Ring	SSE	2.3	CL-84	Supplemental Control	E	0.6
CL-45	Inner Ring	S	2.8	CL-90	Supplemental Control	SE	0.4
CL-46	Inner Ring	SSW	2.8	CL-91	Supplemental Control	ENE	6.1
CL-47	Inner Ring	SW	3.3	CL-97	Supplemental Control	SSW	10.3
CL-48	Inner Ring	WSW	2.3	CL-99	Supplemental Control	NNE	3.5
CL-49	Special Interest	W	3.5	CL-114	Supplemental Control	SSE	12.5

TABLE 2-B

CPS RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SAMPLING LOCATIONS

Station Code	Description	Air	Surface Water	Drinking Water	Food Products	Milk	Ground Water
CL-1	Camp Quest (1.8 miles W)	●					
CL-2	Site's main access road (0.7 miles NNE)	√					
CL-3	Site's secondary access road (0.7 miles NE)	√					
CL-4	Residence near recreation area (0.8 miles SW)	●					
CL-6	CPS recreation area (0.8 miles WSW)	●					
CL-7	Mascoutin Recreation Area (2.3 miles SE)	●					
CL-7D	Mascoutin Recreation Area (2.3 miles ESE)						√
CL-8	DeWitt Cemetery (2.2 miles E)	√					
CL-11*	Illinois Power substation (16 miles S)	√					
CL-12	DeWitt Pumphouse (1.6 miles E)						√
CL-13	Salt Creek bridge on Rt.10 (3.6 miles SW)		●				
CL-14	Station Service Building			√			
CL-15	Near residence on Rt. 900N (0.9 miles N)	√					
CL-90	Start of discharge flume (0.4 miles SE)		√				
CL-91	Parnell Boat Access (6.1 miles ENE)		√				
CL-94	Old Clinton Road (0.6 miles E)	●					
CL-99	North Fork canoe access area (3.5 miles NNE)		●				
CL-106	Pasture (2.0 miles NNE)				●		
CL-114*	Residence in Cisco (12.5 miles SSE)				√		
CL-115	Site's secondary access road (0.7 miles NE)				√		
CL-116	Pasture in rural Kenney (14 miles WSW)					√	
CL-117	Resident north of site (0.9 miles N)				√		
CL-118	Site's main access road (0.7 miles NNE)				√		

Station Code	Description	Grass	Fish	Shoreline Sediment
CL-1	Camp Quest (1.8 miles W)	●		
CL-2	Site's main access road (0.7 miles NNE)	●		
CL-7B	SE of site on Clinton Lake (2.1 miles SE)			√
CL-7C	Mascoutin Recreation Area (1.3 miles SE)			
CL-8	DeWitt Cemetery (2.2 miles E)	●		
CL-10	Illinois Rt.48 bridge (5.0 miles ENE)			
CL-19	End of the discharge flume (3.4 miles E)		√	
CL-88	Located SE of site (2.4 miles SE)			
CL-89	Located NNE of site (3.6 miles NNE)			
CL-105*	Lake Shelbyville (50 miles S)		√	√
CL-116	Pasture in rural Kenney (14 miles WSW)	●		

*Control Location √ ODCM required samples ● Supplemental samples

Note: Location is listed by distance in miles and directional sector from the Station HVAC stack.

TABLE 3-A

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 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 3-B

DETECTION CAPABILITIES FOR ENVIRONMENTAL SAMPLE ANALYSIS LOWER LIMIT OF DETECTION (LLD)

Analysis	Water (pCi/l)	Airborne Particulate or Gas (pCi/m^3)	Fish (pCi/kg – wet)	Milk (pCi/l)	Food Products (pCi/kg - wet)	Sediment (pCi/kg - dry)
Gross Beta	4	0.01				
H^3	2,000*					
Mn^{54}	15		130			
Fe^{59}	30		260			
Co^{58}, Co^{60}	15		130			
Zn^{65}	30		260			
Zr95	30					
Nb^{95}	15					
I^{131}	1**	0.07		1	60	
Cs^{134}	15	0.05	130	15	60	150
Cs^{137}	18	0.06	150	18	80	180
Ba^{140}	60			60		
La^{140}	15			15		

* If no drinking water pathway exists, a value of 3,000 pCi/l may be used.
** If no drinking water pathway exists, a value of 15 pCi/l may be used.

Sample Analysis

Concentrations of radioactivity present in the environment will vary due to factors such as weather conditions, variations in the sampling collection technique and during sample analysis.

Several types of measurements may be performed to provide information about the types of radiation and radionuclides present. Analyses that are performed on environmental samples collected for the CPS REMP include the following:

- Gross alpha and beta analysis
- Gamma spectroscopy analysis
- Tritium analysis
- Strontium analysis
- Gamma dose (TLDs only)

A gross alpha and beta analysis measures the total amount of alpha and beta emitting radioactivity present in a sample. Both radiation[s] may be released by many different radionuclides. Gross activity measurements - while useful as general trend indicators - are not used to establish specific radionuclide concentrations. Therefore, gross activity analysis will only indicate whether the sample contains normal or abnormal concentrations of alpha or beta emitting radioactivity and serves as a precursor in which to identify samples that may require additional follow up analysis.

Samples are primarily analyzed for plant-contributed radionuclides released to the environment. Since naturally occurring radionuclides are abundant in environmental samples – irrespective of CPS Operations - positive results for certain radionuclides and gross alpha / beta measurements are discussed further in this section of the report.

B. Direct Radiation Monitoring

Radionuclides present in the air – in addition to those deposited in or on the ground – will cause human exposure by immersion in the atmosphere or by deposition on the ground. TLDs (Thermo-Luminescent Dosimeters) are used to measure the ambient gamma radiation levels at many locations surrounding Clinton Power Station.

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

During TLD processing, stored energy is released as light and measured by a TLD reader. The light intensity is proportional to the radiation dose the TLD was exposed to. The TLDs used for environmental monitoring around the Clinton Power Station are capable of measuring environmental levels of radiation to approximately twenty (20) mRem per quarter.

Monitoring stations are placed near the site boundary and approximately five (5) miles from the reactor, in locations representing the sixteen (16) meteorological compass sectors. Other locations are chosen to measure the radiation levels at places of special interest such as nearby residences, meeting places and population centers.

Control Locations are located further than ten (10) miles from the site, in areas that will not be influenced by plant operations.

TLD measurements register the gamma ray exposure in milli-Roentgen (mR). For reporting purposes mR is numerically equivalent to that of mRem. Consequently, these terms are used interchangeably throughout this Annual Report.

A total of two-hundred-sixteen (216) TLD measurements were made throughout 2001. The average quarterly dose from our Indicator Location[s] was 18.1 mrem. At our Control Locations, the average quarterly dose was 16.9 mRem. These quarterly measurements ranged from 13.1 to 21.9 mRem for Indicator TLDs and 15.0 to 19.5 mRem for Control TLDs.

Figure 8 compares the 2001 quarterly TLD results with Pre-Operational TLD quarterly averages.

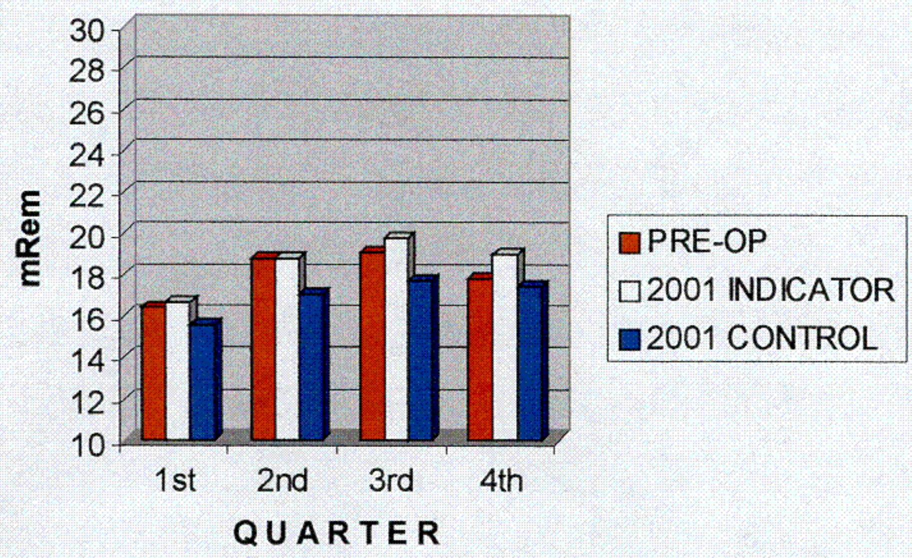
Average doses (±2 standard deviations) - broken down by calendar quarter - are shown in Table 4 for both Indicator and Control Locations.

TABLE 4

AVERAGE QUARTERLY TLD RESULTS Average ± 2σ (mRem/quarter)

QUARTERLY PERIOD	2000 INDICATOR	2001 INDICATOR	PREOP ALL SITES
1st	17.2 ± 2.7	16.3 ± 2.7	16.4 ± 2.9
2nd	18.0 ± 2.8	18.4 ± 2.9	18.8 ± 3.2
3rd	18.8 ± 3.2	19.3 ± 3.5	19.1 ± 4.7
4th	18.3 ± 2.8	18.6 ± 2.6	17.8 ± 2.2
QUARTERLY PERIOD	**2000 CONTROL**	**2001 CONTROL**	**PREOP ALL SITES**
1st	16.6 ± 4.0	15.8 ± 1.3	16.4 ± 2.9
2nd	17.3 ± 2.4	17.1 ± 2.8	18.8 ± 3.2
3rd	17.4 ± 2.8	17.3 ± 3.3	19.1 ± 4.7
4th	17.5 ± 2.6	17.6 ± 3.7	17.8 ± 2.2

FIGURE 8: DIRECT RADIATION COMPARISON



From the above observations – when factoring in the statiscial variances – there was no increase in environmental gamma radiation levels resulted from unit operations at of the Clinton Power Station.

C04

C. Atmospheric Monitoring

The inhalation and ingestion of radionuclides in the air is a direct exposure pathway to man. A network of ten (10) active air samplers around the Clinton Power Station monitors this pathway. There are nine (9) Indicator Location air sampling stations strategically located in areas that are most likely to reveal any measurable effects due to the release of radioactive effluents from the Clinton Power Station. The Control Location is located approximately sixteen (16) miles south of the plant in an area that is totally independent from any of the effects from unit operation[s]. Historical meteorological data indicates that this Control Location is normally upwind from the plant.

Mechanical air samplers are used to draw a continuous volume of air through a filter and charcoal cartridge collecting any particulates and radioiodines that may be present in the atmosphere. These samplers are equipped with a pressure-sensing flow regulator to maintain a constant sampling rate of air flow of about one (1) cubic foot per minute (CFM). The total volume is then calculated based upon the amount of time the air sampler was in operation and the flow rate. This air sampling equipment is maintained and calibrated by Clinton Power Station personnel using reference standards that are traceable back to the National Institute of Standards and Technology (NIST).

Air samples are collected every week and analyzed for gross beta and I^{131} activities. Quarterly, all air particulate filters collected throughout this 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 otherwise mask any plant contributions. Therefore, these filters are not analyzed for at least five (5) days after their collection. This allows for the radioactive decay of short-lived daughters, thus reducing their contribution to the overall gross beta activity.

Results from the gross beta airborne particulate analysis provides for comparisons between both Indicator and Control Locations – including those locations relative to spatial and temporal differences - throughout the year. The calculated annual average was 0.025 pCi/m^3 for all Indicator Locations and 0.026 pCi/m^3 for the Control Location. These results are consistent with our Pre-Operational annual averages for both Indicator and Control Locations that were 0.027 pCi/m^3.

The location with the highest calculated annual average was measured at Indicator Location CL-8 that is located 2.2 miles east of the Clinton Power Station. This location had an average concentration of 0.027 pCi/m^3. Individual location averages for the year are presented in Table 5.

Minor fluctuations in the gross beta concentrations were noted throughout 2001. The general trend for average weekly gross beta concentrations from the Indicator Locations correlated to the trend for the 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. There were no significant differences observed between these individual locations. Monthly averages for Indicator and Control Locations for the year are presented in Table 6.

Fluctuations observed in the gross beta activity over the year can be attributed to changes in the environment, specifically during seasonal changes.

All gross beta concentrations for 2001 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 [Beryllium] was the only gamma-emitting radionuclide detected in analyses of particulate filters.

No measurable contribution to the overall level of airborne particulate radioactivity was identified as a result of unit operations. The radioactivity that was detected - naturally occurring Be^7 - is normally found in the environment and is consistent with the expected concentrations of natural radioactivity and fallout from prior atmospheric nuclear weapons testing.

TABLE 5

ANNUAL AVERAGE GROSS BETA CONCENTRATIONS IN AIR PARTICULATES

Average ± 2σ (pCi/m^3)

Station	Description	2000	2001
CL-1	Camp Quest @ Birkbeck	0.027 ± 0.021	0.025 ± 0.009
CL-2	CPS Main Access Road	0.027 ± 0.021	0.026 ± 0.008
CL-3	CPS Secondary Access Road	0.028 ± 0.022	0.026 ± 0.010
CL-4	0.8 miles SW	0.027 ± 0.022	0.025 ± 0.009
CL-6	CPS Recreation Area	0.027 ± 0.026	0.026 ± 0.009
CL-7	Mascoutin State Recreation Area	0.025 ± 0.019	0.024 ± 0.010
CL-8	DeWitt Cemetery	0.026 ± 0.021	0.027 ± 0.008
CL-11[a]	IP Substation @ Argenta	0.027 ± 0.019	0.026 ± 0.009
CL-15	0.9 miles N	0.026 ± 0.021	0.025 ± 0.013
CL-94	Old Clinton Road – 0.6 miles E	0.027 ± 0.023	0.026 ± 0.009

(a) Control Station

TABLE 6

AVERAGE MONTHLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATES

Average ± 2σ (pCi/m^3)

MONTH	2000 Indicator	2001 Indicator	2000 Control	2001 Control
January	0.034 ±0.002	0.033 ±0.004	0.035 ±0.016	0.033 ±0.014
February	0.030 ±0.002	0.029 ±0.003	0.030 ±0.018	0.027 ±0.007
March	0.020 ±0.001	0.021 ±0.003	0.020 ±0.011	0.022 ±0.009
April	0.018 ±0.003	0.022 ±0.004	0.019 ±0.005	0.023 ±0.008
May	0.021 ±0.002	0.019 ±0.004	0.022 ±0.005	0.019 ±0.013
June	0.019 ±0.002	0.021 ±0.003	0.020 ±0.009	0.021 ±0.009
July	0.022 ±0.004	0.025 ±0.004	0.023 ±0.005	0.026 ±0.004
August	0.027 ±0.002	0.026 ±0.003	0.029 ±0.020	0.027 ±0.007
September	0.022 ±0.002	0.026 ±0.002	0.021 ±0.011	0.026 ±0.006
October	0.034 ±0.004	0.022 ±0.003	0.033 ±0.022	0.021 ±0.011
November	0.034 ±0.004	0.033 ±0.004	0.033 ±0.030	0.033 ±0.036
December	0.038 ±0.005	0.029 ±0.002	0.036 ±0.024	0.028 ±0.011

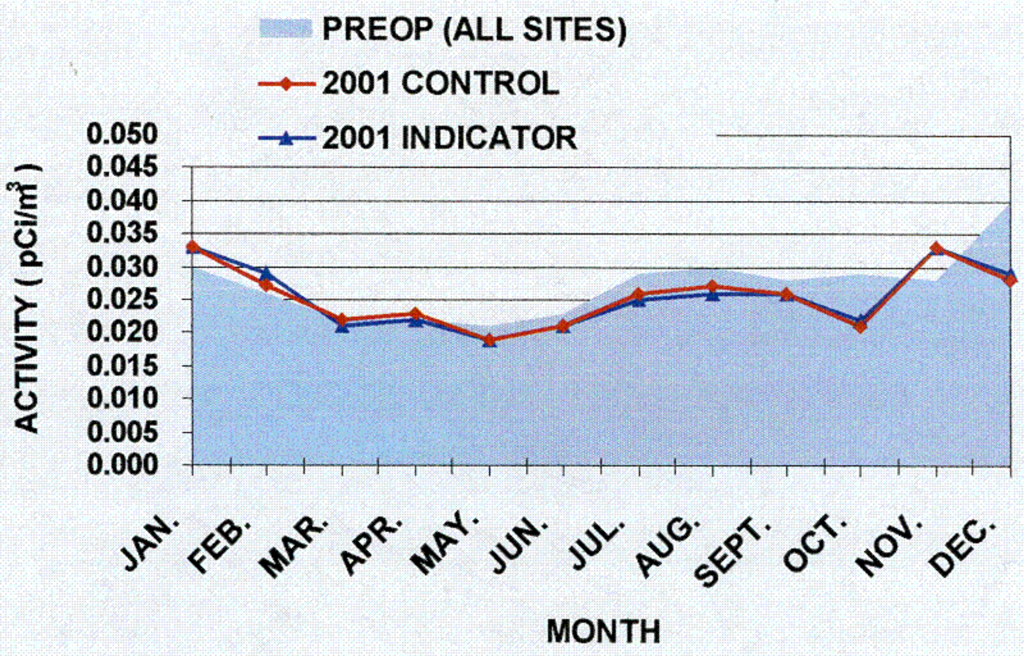


FIGURE 9: AIR PARTICULATE GROSS BETA ACTIVITY COMPARISON

C05

D. Aquatic Monitoring

The Clinton Power Station utilizes a man-made lake as the source of cooling water and returns this used cooling water to the same lake while most nuclear power stations use once-through flow from a river, an ocean or body of water much larger than Clinton Lake. If radioactive liquid effluents were to be discharged from the Clinton Power Station into the cooling water outfall, long-lived radioisotopes could build up over a period time as the same water is reused on successive trips through the plant. Cooling water that exits from the plant will travel back into the eastern arm of Clinton Lake and then into the northern arm of the lake before returning back into the plant. Although the only user of Clinton Lake as a source of drinking water is CPS itself, 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 from liquid effluents. Aquatic monitoring provides for the collection of fish and shoreline sediments to detect the presence of any radioisotopes related to the operation of the Clinton Power Station. These samples are analyzed for naturally occurring and man-made radioactive materials. Both Indicator and Control Location[s] are sampled. Indicator samples were taken from various locations throughout Clinton Lake whereas Control samples are obtained from Lake Shelbyville - approximately fifty (50) miles south of Clinton Power Station – thus serving as an excellent comparison to unit operations.

In addition to naturally occurring radioisotopes, Sr^{90} was found in one sample. However, the overall concentrations of radionuclides in samples collected near the Clinton Power Station were comparable to the concentrations in samples collected from the Control Location at Lake Shelbyville. The presence of this fission product is attributable to previous nuclear weapons testing and fallout from the accident occurring at Chernobyl. The operation of Clinton Power Station had no measurable contribution to the radioactive inventory of the aquatic environment.

Fish

Various samples of fish are collected from Clinton Lake and Lake Shelbyville. From both lakes; these samples consists of largemouth bass, crappie, carp, and bluegill. The selections of these species are the fish most commonly harvested from the lakes by sport fishermen. Fish will ingest sediments during bottom feeding - or prey on other organisms - which will also ingest sediments that may otherwise retain radionuclides. A radiological analysis from fish samples provides key information on the potential ingestion of radionuclides by humans via this aquatic pathway. These samples are collected semi-annually and analyzed by gamma spectroscopy.

The gamma spectroscopy analysis revealed that fish samples showed the presence of naturally occurring K^{40} [Potassium] in all samples. All other analytical results were less than the lower limit of detection (LLD) for each radionuclide.

Shoreline Sediments

Samples of shoreline sediments were collected at both Clinton Lake and at Lake Shelbeyville. Radiological analyses of shoreline sediments provide information on any potential shoreline exposure to humans, determining long-term trends, and the accumulation of long-lived radionuclides from the environment. Samples are collected semi-annually 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 were present in samples taken at both Indicator and Control Locations. There was only one fission product - Sr^{90} – that was detected from the Control Location. The activity detected was well within the range from that measured during the Pre-Operational period.

Isotope	Pre-Op Range (pCi/g dry)	2000 Range (pCi/g dry)	2001 Range (pCi/g dry)
Sr^{90}	0.011 - 0.056	0.014 - 0.044	0.011 – 0.027

E. Terrestrial Monitoring

In addition to direct radiation, radionuclides that are present in our atmosphere expose individuals when they are deposited on plant and soil surfaces. Consuming animal products - such as meat and milk - subsequently ingests them either directly by man or indirectly. To monitor this food pathway, samples of green leafy vegetables, grass and milk are analyzed.

Surface vegetation samples are collected monthly during the growing season from a number of locations for the purpose of monitoring the potential buildup of atmospherically deposited radionuclides. Because the radionuclides of interest – relative to Clinton Power Station operations - are already present within our environment as a result of several decades of worldwide fallout or because they are naturally occurring, the presence of these radionuclides is anticipated from all of the samples collected. These samples are analyzed by gamma spectroscopy.

The gamma spectroscopy analysis revealed the presence of naturally occurring K^{40} [Potassium] and Be^{7} [Beryllium] in several samples. All other analytical results were less than the lower limit of detection (LLD) for each radionuclide. 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 (5) mile radius of the Clinton Power Station. Milk samples are collected from a dairy located about fourteen (14) miles west 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.

Results from these analyses showed Sr^{90} concentrations ranging from 0.5 to 3.1 pCi/l [pico-curies per liter of milk]. The analysis of Sr^{90} on milk samples was added to the REMP during the operational phase of the program and as such, no Pre-Operational data for this isotope is available [see below*]. There was no I^{131} detected in any of the milk samples collected.

Isotope	Pre-Op Range (pCi/l)	2000 Range (pCi/l)	2001 Range (pCi/l)
Sr^{90}	*Not Available	0.2 – 3.2	0.5 – 3.1

Grass

In addition to milk samples, grass samples are also collected at three (3) Indicator Locations and at one (1) Control Location. These samples are collected twice a month during May through October and once a month during November through April (when available). Grass samples are analyzed for gamma isotopic activity including I^{131}.

The results from the analyses showed only naturally occurring Be^7 and K^{40} in these samples. There was no I^{131} detected in any of the grass samples collected.

Vegetables

The Clinton Power Station obtains broadleaf vegetable samples from three (3) Indicator Locations and at one (1) Control Location. The Indicator Locations are located in the meteorological sectors with the highest potential for surface deposition and the Control Location is in a meteorological sector and distance – approximately thirteen (13) miles downwind - which is considered to be unaffected by unit operations. Samples are collected once a month during the growing season (June through September) and are analyzed for gross beta and gamma isotopic activities including I^{131}.

The results from the analyses showed only naturally occurring Be^7 and K^{40} from these samples. There was no I^{131} detected in any of the vegetable samples collected.

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 relative to unit operations at the Clinton Power Station.

The only identified user of water from Clinton Lake for domestic purposes is the Clinton Power Station. Samples taken are analyzed for naturally occurring and man-made radioactive isotopes. Average gross beta concentrations in surface, drinking and well water[s] are presented in Table 7 at the end of this section.

Water monitoring results show no measurable effects resulting from the operation of the Clinton Power Station.

Drinking Water

A composite water sampler is located at the Station Service Building that 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 our contracted laboratory service represents a composite of the individual samples that are collected throughout the month. This monthly composite sample is then analyzed for gross alpha, gross beta and gamma isotopic activities. A portion of each of these monthly samples is further mixed with the other monthly samples collected during each calendar quarter. This quarterly composite sample is then analyzed for H^3 [Tritium].

Gross beta activity ranged from 0.9 to 2.1 pCi/l. These levels are attributed to very fine particles of sediment containing K^{40} which are not removed during the chlorination and filtration process.

The results from the H^3 and gamma-emitting radioisotope analysis were all less than the lower limit of detection (LLD).

Surface Water

Composite Water Samplers are installed at three (3) locations sampling surface water from Clinton Lake. These Composite Water Samplers collect a small volume of surface water at regular intervals and discharge the sample into a large sample collection bottle. Monthly, this water is then collected.

Two (2) of the Composite Water Samplers are located upstream from Clinton Power Station and are therefore unaffected by any plant liquid releases occurring downstream. The other Composite Water Sampler is positioned to sample water being released from the plant at the start of the plant discharge flume. Grab samples are collected from one (1) Indicator Location on Clinton Lake.

Surface water samples are analyzed for gross beta, gamma isotopic, and H^3 [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 quarterly from all of the monthly composites from all Water Composite Sample locations.

Results of all gross beta analyses ranged from 1.1 to 7.4 pCi/l for the composite water samples and 2.3 to 3.2 pCi/l for the grab samples. Pre-Operational 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 the water. Other types of samples – such as Shoreline Sediments - have further validated the presence of K^{40} in Clinton Lake

All samples analyzed for H^3 [Tritium] were all less than the lower limits of detection (LLD). Pre-Operational H^3 [Tritium] concentrations ranged from 220 to 330 pCi/l. As noted in Reference EI87, previous nuclear weapons testing has increased the pre-1960 levels of Tritium (6-24 pCi/l) by a factor of approximately fifty (50) to 300-1,200 pCi/l.

Gamma-emitting radioisotopes were all below the lower limits of detection (LLD) and there wasn't any I^{131} detected from any surface water sample collected.

Well Water

Every quarter - both treated and untreated well water samples - are collected from the well serving the Village of DeWitt and from a well serving the Illinois Department of Conservation at the Mascoutin State Recreational Area. Each sample is analyzed for I^{131}, gross alpha, gross beta, H^3 [Tritium] and gamma isotopic activities.

Results of the gross beta analyses ranged from 1.9 to 2.4 pCi/l. Pre-Operational 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.

Gamma-emitting radioisotopes were all below the lower limits of detection (LLD) and there wasn't any I^{131} or H^3 detected from any well water sample collected.

TABLE 7

AVERAGE GROSS BETA CONCENTRATIONS IN DRINKING, SURFACE AND WELL WATER

Average $\pm 2\sigma$ (pCi/l)

STATION	DESCRIPTION	2000	2001
	Drinking Water		
CL-14	CPS (Service Building)	1.2 ± 0.5	1.4 ± 0.6
	Surface Water		
CL-13	Salt Creek (below dam)	2.5 ± 0.9	2.9 ± 0.8
CL-90	CPS Discharge Flume	2.6 ± 1.1	2.9 ± 1.5
CL-91	Parnell Boat Access	2.3 ± 1.4	2.7 ± 0.9
CL-99	North Fork Canoe Access	3.1 ± 2.1	3.4 ± 4.2
	Well Water		
CL-7D	Mascoutin State Recreation Area	2.0 ± 0.8*	2.3 ± 0.8*
CL-12(**T**)	DeWitt Pump Station	2.9 ± 0.9	2.4 ± 0.0
CL-12(**U**)	DeWitt Pump Station	2.1 ± 1.4*	1.9 ± 1.3*

(**U**) Untreated (**T**) Treated

*only one positive result

G. Quality Assurance Program

To establish confidence and credibility that the data collected and reported is accurate and precise, REMP activities are incorporated into the Quality Assurance (QA) program, which includes assessments, audits, and surveillances. The Quality Assurance program requires the following:

- Participation in inter-comparison programs, such as the Environmental Resource Associates (ERA) cross-check program.
- Audits of analysis laboratory functions and their facilities.
- Periodic review of the Clinton Power Station procedures specifying sampling techniques.
- Duplicate analysis of all samples received (excluding TLDs). This requirement is to check laboratory precision.
- The routine counting of quality control samples.

The analytical results provided by the laboratory were reviewed monthly to ensure the required minimum sensitivities have been achieved and the proper analyses have been performed.

Our Vendor - Environmental Inc. - has participated in interlaboratory comparison (crosscheck) programs since the formulation of their quality control program back in December 1971. These programs are operated by agencies which supply environmental type samples – such as milk and water - containing concentrations of radionuclides that are only known to the issuing agency and not the participating laboratory. The purpose of such a program is to provide an independent check on the laboratory's analytical procedures and alert them to any possible problems.

Results from the 2001 Environmental Inc. cross-check program are shown in Appendix A.

H. Changes to the REMP During 2001

On occasion, revisions to the Radiological Environmental Monitoring Program are necessary so as 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, to incorporate revised or new regulatory requirements or Quality Assurance audits.

During the course of 2001, there were no changes to the REMP program as delineated within the Off-Site Dose Calculation Manual.

2001 ANNUAL LAND USE CENSUS

IV. 2001 ANNUAL LAND USE CENSUS

Each year an Annual Land Use Census is conducted to ensure that changes in the use of areas - at and beyond the site boundary - are identified and that any necessary modifications to the Radiological Environmental Monitoring Program (REMP) are made. The information gathered during the Annual Land Use Census is used for Radioactive Effluent Technical Specifications (RETS) dose assessments and feeds into the REMP ensuring that these programs are as current as possible.

The Annual Land Use Census is conducted during the growing season satisfying the CPS Offsite Dose Calculation Manual (ODCM) requirements. The Annual Land Use Census is conducted to identify the nearest milk animals, the nearest residence and the nearest garden of greater than five-hundred (500) square feet that produce broadleaf vegetation – all within a distance of five (5) miles - in each of the sixteen (16) meteorological sectors.

The Annual Land Use Census shall also identify - within a distance of three (3) miles - the location in each of the sixteen (16) meteorological sectors all milk animals and all gardens of greater than five-hundred (500) square feet that produce broadleaf vegetation. A detailed summary of the Annual Land Use Census is provided in a separate document and permanently archived at CPS.

In order to assemble as much information as possible, the locations of residences, critical age groups, milk animals, vegetable garden contents, and livestock were recorded for each sector within five (5) miles, as stated above.

These land use parameters are then used in the assessment of potential radiological doses to individuals for the stated sectors. This information provides the most restrictive parameters used for dose assessments that will result in the highest calculated dose within each sector. Additional information regarding dose assessments to members of the public is provided within the 2001 CPS Annual Radioactive Effluent Release Report.

Direct contact, a mail-in questionnaire, telephone, or direct observation surveyed two-hundred forty (240) area residents. The information provided in this section of the report is a summary of the results of the census. The nearest residence, garden, and milk animal in each sector out to five (5) miles are given in Table 8.

Data for this census was obtained using the following means:

◦ Performed door-to-door solicitation of residences / land owners identified from the previous year's Annual Land Use Census and the most current DeWitt County plat book. If a resident was unavailable for this questioning, a questionnaire was placed on their door requesting them to answer the questions and mailing back to the Station.

◦ Performed telephone solicitation of person[s] who were unavailable during the door-to-door survey and who did not mail back their questionnaire.

◦ By direct observation of their land use when the aforementioned methods proved unsuccessful. If an individual was unable to be contacted, then data from the previous year was utilized.

° Contacted several state and local agencies.

TABLE 8

ANNUAL LAND USE CENSUS SUMMARY RESULTS

Sector	Nearest Residence (miles)	Nearest Garden (miles)	Nearest Milk Animal (miles)
N	0.9	0.9	0.9
NNE	1.0	2.9	1.3
NE	1.3	2.1	3.4
ENE	1.8	2.6	4.8
E	1.0	1.0	1.0
ESE	3.2	3.3	*
SE	2.8	4.4	4.4
SSE	1.8	2.8	*
S	3.0	3.0	*
SSW	2.9	*	3.4
SW	0.7	3.6	3.6
WSW	1.6	2.2	3.4
W	1.6	2.1	2.1
WNW	1.6	1.6	*
NW	1.6	2.9	2.4
NNW	1.7	*	1.3

(*) None identified within five (5) miles of CPS in this meteorological sector.

The Annual Land Use Census results were validated to ensure that the REMP will provide representative measurements of radiation and radioactive materials from exposure pathways and for radionuclides that lead to the highest potential radiation exposure to the general public resulting from unit operations.

After carefully reviewing the Annual Land Use Census results - coupled with effluent release information – provided by the CPS Chemistry Department, an evaluation is conducted ensuring current ODCM sampling location requirements are satisfied. As a result of that evaluation, no changes to the REMP were required.

Summary of Changes Identified in 2001 Annual Land Use Census

Nearest Residence

No changes were identified for the nearest residence in the sixteen (16) meteorological sectors.

Garden Census

One-hundred-ten (110) gardens within a five (5) mile radius were located in the sixteen (16) geographical sectors surrounding CPS that contained broad leaf vegetation – such as lettuce and cabbage - and were greater than five-hundred (500) square feet.

Changes in census locations for the nearest garden were identified in three (3) of the sixteen (16) geographical sectors and are indicated below:

2000 Census Location	2001 Census Location
> 5 miles SE	4.4 miles SE
1.6 miles W	2.1 miles W
2.3 miles NNW	> 5 miles NNW

There were no changes or additions to the REMP garden sampling locations as a result of the Garden Census.

Milk Animal Census

Milk animals within five (5) miles were located in the sixteen (16) geographical sectors surrounding CPS. Twelve (12) locations were identified within this five (5) mile radius. Only milk animals were specifically identified for this report. Of the livestock identified, milk animals were being raised primarily for nursing (nursing of their calves) and were being used for meat production (for both their own use and sold commercially). There were no residents that milked their animals for any human consumption. Other livestock raised in the area were identified, but will not be addressed within this report.

Changes in the census locations for the nearest livestock / dairy were identified in one (1) of the sixteen (16) geographical sectors and are indicated below:

2000 Census Location	2001 Census Location
> 5 miles SE	4.4 miles SE

No changes or additions to REMP milk sampling locations were made as a result of the Milk Animal Census.

LIST OF REFERENCES

V. LIST OF REFERENCES

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

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

- CPS 2000 Annual Radioactive Effluent Release Report.

- "Environmental Radioactivity," M. Eisenbud, 1987 (EI87).

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

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

- 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).

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

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

- 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).

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

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

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

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

- 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".

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

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

- 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.

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

- 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.

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

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

- Clinton Power Station, Updated Safety Analysis Report.

- Clinton Power Station, Unit 1, OFFSITE DOSE CALCULATION MANUAL.

APPENDICIES

Environmental, Inc.
Midwest Laboratory
an Allegheny Technologies Co.

700 Landwehr Road • Northbrook, IL 60062-2310
(847) 564-0700 fax (847) 564-4517

APPENDIX A

INTERLABORATORY COMPARISON PROGRAM RESULTS

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

January, 2001 through December, 2001

Appendix A

Interlaboratory Comparison Program Results

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

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

The results in Table A-1 were obtained through participation in the environmental sample crosscheck program for milk, water and air filters during the past twelve months. Data for previous years is available upon request.

This program was conducted by the U.S. Environmental Protection Agency Office of Research and Development National Exposure Research Laboratory Characterization Research Division-Las Vegas, Nevada.

The results in Table A-2 were obtained for Thermoluminescent Dosimeters (TLDs), via various International Intercomparisons of Environmental Dosimeters under the sponsorships listed in Table A-2. Results of crosscheck testing with Teledyne Brown Engineering are also listed.

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

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

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

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

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

Attachment A lists acceptance criteria for "spiked" samples.

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

ATTACHMENT A

ACCEPTANCE CRITERIA FOR "SPIKED" SAMPLES

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

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

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

[b] Laboratory limit.

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

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[b] Laboratory result[c]	ERA Result[d]	Control Limits
STW-897	WATER	Jan, 2001	Gr. Alpha	31.9 ± 2.1	45.7 ± 11.4	25.9 - 65.5
STW-897	WATER	Jan, 2001	Gr. Beta	25.3 ± 2.7	16.7 ± 5.0	8.0 - 25.4
STW-900	WATER	Feb, 2001	I-131	27.2 ± 0.8	28.3 ± 3.0	23.1 - 33.5
STW-902	WATER	Feb, 2001	Ra-226	4.0 ± 0.1	4.7 ± 0.7	3.4 - 5.9
STW-902	WATER	Feb, 2001	Ra-228	13.8 ± 0.4	14.4 ± 3.6	8.2 - 20.6
STW-902	WATER	Feb, 2001	Uranium	17.0 ± 0.3	20.4 ± 3.0	15.2 - 25.6
STW-903	WATER	Mar, 2001	H-3	17,400.0 ± 69.7	17,800.0 ± 1,780.0	14,700. - 20,900.0
STW-917	WATER	Apr, 2001	Gr. Alpha	57.4 ± 3.5	56.0 ± 14.0	31.8 - 80.2
STW-917	WATER	Apr, 2001	Ra-226	13.5 ± 0.4	17.7 ± 2.7	13.1 - 22.3
STW-917	WATER	Apr, 2001	Ra-228	10.1 ± 0.6	8.1 ± 2.0	4.6 - 11.6
STW-917	WATER	Apr, 2001	Uranium	14.2 ± 0.2	15.6 ± 3.0	10.4 - 20.8
STW-918	WATER	Apr, 2001	Co-60	27.9 ± 1.4	26.4 ± 5.0	17.7 - 35.1
STW-918	WATER	Apr, 2001	Cs-134	16.0 ± 0.4	16.9 ± 5.0	8.2 - 25.6
STW-918	WATER	Apr, 2001	Cs-137	195.4 ± 1.5	186.0 ± 9.3	170.0 - 202.0
STW-918	WATER	Apr, 2001	Gr. Beta	340.0 ± 51.0	343.0 ± 1.7	252.0 - 428.0
STW-918	WATER	Apr, 2001	Sr-89	62.8 ± 5.7	64.1 ± 5.0	55.5 - 72.8
STW-918	WATER	Apr, 2001	Sr-90	34.2 ± 1.6	33.8 ± 5.0	25.1 - 42.5
STW-919	WATER	Jun, 2001	Ba-133	37.8 ± 1.2	36.0 ± 5.0	27.3 - 44.7
STW-919	WATER	Jun, 2001	Co-60	49.9 ± 0.7	46.8 ± 5.0	38.1 - 55.5
STW-919	WATER	Jun, 2001	Cs-134	16.0 ± 1.4	15.9 ± 5.0	7.2 - 24.6
STW-919	WATER	Jun, 2001	Cs-137	208.0 ± 1.7	197.0 ± 9.9	180.0 - 214.0
STW-919	WATER	Jun, 2001	Zn-65	37.8 ± 0.7	36.2 ± 5.0	27.5 - 44.9
STW-920	WATER	Jun, 2001	Ra-226	14.6 ± 0.4	15.4 ± 2.3	11.4 - 19.4
STW-920	WATER	Jun, 2001	Ra-228	6.2 ± 0.2	4.5 ± 1.1	2.6 - 6.5
STW-920	WATER	Jun, 2001	Uranium	49.0 ± 1.0	55.7 ± 5.6	46.1 - 65.3
STW-921	WATER	Jul, 2001	Sr-89	19.8 ± 1.5	31.2 ± 5.0	22.5 - 39.9
	Delay in processing may have attributed to deviation. Result of reanalysis; Sr-89, 35.3 ± 4.4 pCi/L. Sr-90, 25.0 ± 2.8 pCi/L.					
STW-921	WATER	Jul, 2001	Sr-90	26.3 ± 1.1	25.9 ± 5.0	17.2 - 34.6
STW-922	WATER	Jul, 2001	Gr. Alpha	23.3 ± 1.9	17.8 ± 5.0	9.1 - 26.5
STW-922	WATER	Jul, 2001	Gr. Beta	48.5 ± 4.6	53.0 ± 10.0	35.7 - 70.3
STW-924	WATER	Aug, 2001	H-3	2,680.0 ± 41.9	2,730.0 ± 356.0	2,110.0 - 3,350.0
STW-931	WATER	Sep, 2001	Ra-226	10.9 ± 0.2	10.8 ± 1.6	8.0 - 13.6
STW-931	WATER	Sep, 2001	Ra-228	9.7 ± 1.1	9.0 ± 2.2	5.1 - 12.8
STW-931	WATER	Sep, 2001	Uranium	11.2 ± 0.1	13.1 ± 3.0	7.9 - 18.3
STW-932	WATER	Oct, 2001	I-131	7.7 ± 0.3	7.7 ± 2.0	4.2 - 11.2
STW-933	WATER	Oct, 2001	Gr. Alpha	82.2 ± 4.0	97.5 ± 24.4	55.3 - 140.0
STW-933	WATER	Oct, 2001	Ra-226	9.5 ± 1.2	10.8 ± 1.6	8.0 - 13.6

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

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[b] Laboratory result[c]	ERA Result[d]	Control Limits
STW-933	WATER	Oct, 2001	Ra-228	17.0 ± 0.8	15.6 ± 3.9	8.9 - 22.4
STW-933	WATER	Oct, 2001	Uranium	32.2 ± 1.4	37.2 ± 3.7	30.7 - 43.6
STW-934	WATER	Oct, 2001	Co-60	82.4 ± 0.9	78.4 ± 5.0	69.7 - 87.1
STW-934	WATER	Oct, 2001	Cs-134	52.2 ± 1.3	54.1 ± 5.0	45.4 - 62.8
STW-934	WATER	Oct, 2001	Cs-137	39.4 ± 0.6	37.9 ± 5.0	26.3 - 43.7
STW-934	WATER	Oct, 2001	Gr. Beta	166.0 ± 7.1	192.0 ± 28.8	142.0 - 242.0
STW-934	WATER	Oct, 2001	Sr-89	12.8 ± 0.8	16.7 ± 5.0	8.0 - 25.4
STW-934	WATER	Oct, 2001	Sr-90	6.8 ± 0.7	7.7 ± 5.0	-1.0 - 16.4
STW-935	WATER	Oct, 2001	Gr. Alpha	63.5 ± 2.5	64.0 ± 16.0	36.5 - 91.5
STW-935	WATER	Oct, 2001	Gr. Beta	26.0 ± 1.2	21.5 ± 5.0	12.8 - 30.2
STW-938	WATER	Nov, 2001	Ba-133	66.7 ± 1.2	69.3 ± 6.9	57.5 - 81.1
STW-938	WATER	Nov, 2001	Co-60	59.3 ± 0.6	59.7 ± 5.0	51.0 - 68.4
STW-938	WATER	Nov, 2001	Cs-134	86.7 ± 1.5	93.9 ± 5.0	85.2 - 103.0
STW-938	WATER	Nov, 2001	Cs-137	45.0 ± 1.0	42.0 ± 5.0	33.3 - 50.7
STW-938	WATER	Nov, 2001	Zn-65	80.7 ± 0.6	77.3 ± 7.7	63.9 - 90.7

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

[b] All results are in pCi/L, except for elemental potassium (K) data in milk, which are in mg/L; air filter samples, which are in pCi/Filter.

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

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

Table A-2. Crosscheck program results; Thermoluminescent Dosimeters. (TLDs).

Lab Code	TLD Type	Date	Measurement	mR Known Value	mR Lab result ± 2 Sigma	mR Control Limits
Teledyne Brown Engineering						
2000-1	LiF-100 Chips	Mar, 2000	Reader 1, #1	17.8	14.4 ± 0.2	12.46 - 23.14
2000-1	LiF-100 Chips	Mar, 2000	Reader 1, #2	35.5	32.4 ± 0.1	24.85 - 46.15
2000-1	LiF-100 Chips	Mar, 2000	Reader 1, #3	62.2	61.8 ± 0.9	43.54 - 80.86
Teledyne Brown Engineering						
2000-2	$CaSO_4$: Dy Cards	Mar, 2000	Reader 1, #1	17.8	21.3 ± 0.3	12.46 - 23.14
2000-2	$CaSO_4$: Dy Cards	Mar, 2000	Reader 1, #2	35.5	40.1 ± 1.9	24.85 - 46.15
2000-2	$CaSO_4$: Dy Cards	Mar, 2000	Reader 1, #3	62.2	69.9 ± 3.5	43.54 - 80.86

Chips and cards irradiated by Teledyne Brown Engineering, Westwood, New Jersey, in March of 2000.

Lab Code	TLD Type	Date	Measurement	mR Known Value	mR Lab result ± 2 Sigma	mR Control Limits
12th International Intercomparison						
022-1	$CaSO_4$: Dy Cards	Jun, 2000	Field	161.0	184.9 ± 1.9	112.70 - 209.30
022-1	$CaSO_4$: Dy Cards	Jun, 2000	Field 1	548.0	502.2 ± 1.7	383.60 - 712.40
022-1	$CaSO_4$: Dy Cards	Jun, 2000	Field 2	391.0	412.0 ± 2.9	273.70 - 508.30
022-1	$CaSO_4$: Dy Cards	Jun, 2000	Field 3	623.0	643.2 ± 2.9	436.10 - 809.90
022-1	$CaSO_4$: Dy Cards	Jun, 2000	Lab, 1	391.0	442.8 ± 2.5	273.70 - 508.30
Environmental, Inc.						
2001-1	$CaSO_4$: Dy Cards	Dec, 2001	Reader 1, #1	4.0	3.7 ± 0.1	2.79 - 5.17
2001-1	$CaSO_4$: Dy Cards	Dec, 2001	Reader 1, #1	4.0	3.4 ± 0.1	2.79 - 5.17
2001-1	$CaSO_4$: Dy Cards	Dec, 2001	Reader 1, #2	7.1	7.9 ± 0.2	4.95 - 9.19
2001-1	$CaSO_4$: Dy Cards	Dec, 2001	Reader 1, #2	7.1	7.6 ± 0.3	4.95 - 9.19
2001-1	$CaSO_4$: Dy Cards	Dec, 2001	Reader 1, #3	15.9	18.6 ± 0.4	11.13 - 20.67
2001-1	$CaSO_4$: Dy Cards	Dec, 2001	Reader 1, #3	15.9	19.6 ± 0.1	11.13 - 20.67
2001-1	$CaSO_4$: Dy Cards	Dec, 2001	Reader 1, #4	63.6	78.2 ± 1.2	44.53 - 82.69
2001-1	$CaSO_4$: Dy Cards	Dec, 2001	Reader 1, #4	63.6	79.9 ± 2.5	44.53 - 82.69

Table A-3. In-house "spike" samples.

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[a] Laboratory results 2s, n=1[b]	Known Activity	Control[c] Limits
SPAP-477	Air Filter	Jan, 2001	Cs-137	1.76 ± 0.02	1.68	1.01 - 2.35
SPW-479	Water	Jan, 2001	H-3	54702.00 ± 644.00	54549.00	43639.20 - 65458.80
SPW-481	Water	Jan, 2001	Gr. Alpha	58.08 ± 2.79	69.14	34.57 - 103.71
SPW-481	Water	Jan, 2001	Gr. Beta	213.83 ± 3.07	220.26	198.23 - 242.29
SPW-482	Water	Jan, 2001	Gr. Alpha	51.77 ± 2.18	69.14	34.57 - 103.71
SPW-482	Water	Jan, 2001	Gr. Beta	202.48 ± 2.98	220.26	198.23 - 242.29
SPW-483	Water	Jan, 2001	Ra-226	20.11 ± 0.34	20.86	14.60 - 27.12
SPW-483	Water	Jan, 2001	Ra-228	10.55 ± 2.02	19.43	13.60 - 25.26
Sample was lost during analysis. Insufficient sample available to perform reanalysis.						
SPW-485	Water	Jan, 2001	Co-60	33.53 ± 3.40	31.13	21.13 - 41.13
SPW-485	Water	Jan, 2001	Cs-134	32.80 ± 2.54	30.81	20.81 - 40.81
SPW-485	Water	Jan, 2001	Cs-137	42.10 ± 5.60	36.00	26.00 - 46.00
SPW-485	Water	Jan, 2001	Sr-90	154.34 ± 3.49	137.66	110.13 - 165.19
SPAP-754	Air Filter	Jan, 2001	Gr. Beta	8.53 ± 0.02	7.88	-2.12 - 17.88
SPW-1037	Water	Feb, 2001	U-233/4	3.74 ± 0.10	4.17	2.50 - 5.84
SPW-1037	Water	Feb, 2001	U-238	3.81 ± 0.10	4.17	-7.83 - 16.17
SPW-1224	Water	Feb, 2001	Ra-226	21.25 ± 0.50	20.68	14.48 - 26.88
SPW-1224	Water	Feb, 2001	Ra-228	21.76 ± 2.65	19.27	13.49 - 25.05
SPW-1225	Water	Feb, 2001	Gr. Alpha	71.87 ± 3.07	69.14	34.57 - 103.71
SPW-1225	Water	Feb, 2001	Gr. Beta	36.30 ± 1.47	28.75	18.75 - 38.75
SPW-1272	Water	Feb, 2001	I-131	56.82 ± 0.71	63.05	50.44 - 75.66
SPW-1272	Water	Feb, 2001	I-131(g)	65.69 ± 10.21	63.05	53.05 - 73.05
SPVE-1274	Vegetation	Feb, 2001	I-131(g)	0.78 ± 0.05	0.76	0.45 - 1.06
SPCH-1276	Charcoal	Feb, 2001	I-131(g)	1.57 ± 0.05	1.58	0.95 - 2.21
SPMI-1270	Milk	Mar, 2001	Cs-134	31.89 ± 4.71	29.77	19.77 - 39.77
SPMI-1270	Milk	Mar, 2001	Cs-137	46.61 ± 8.81	35.90	25.90 - 45.90
The Cs-137 spike is suspect; A new cesium spike has been prepared. Reference to SPMI-3232.						
SPMI-1270	Milk	Mar, 2001	I-131(g)	81.92 ± 10.80	81.95	71.95 - 91.95
SPU-2901	Urine	Mar, 2001	H-3	51512.00 ± 1369.00	50189.00	40151.20 - 60226.80
SPW-2161	Water	Mar, 2001	Ra-228	29.92 ± 5.13	31.75	22.23 - 41.28
SPU-3128	Urine	Apr, 2001	H-3	2065.00 ± 408.00	2008.00	1317.37 - 2698.63
SPW-3129	Water	Apr, 2001	Gr. Alpha	37.94 ± 2.42	34.57	17.29 - 51.86

Table A-3. In-house "spike" samples.

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[a]: Laboratory results 2s, n=1[b]	Known Activity	Control[c] Limits
SPW-3129	Water	Apr, 2001	Gr. Beta	117.83 ± 2.37	109.46	98.51 - 120.41
SPAP-3508	Air Filter	Apr, 2001	Gr. Beta	0.80 ± 0.01	0.78	-9.22 - 10.78
SPMI-3232	Milk	Apr, 2001	Cs-134	32.69 ± 6.50	33.96	23.96 - 43.96
SPMI-3232	Milk	Apr, 2001	Cs-137	44.20 ± 9.08	35.79	25.79 - 45.79
SPMI-3232	Milk	Apr, 2001	I-131	48.05 ± 0.90	56.68	45.34 - 68.02
SPMI-3232	Milk	Apr, 2001	I-131(g)	55.64 ± 11.39	56.68	46.68 - 66.68
SPMI-3232	Milk	Apr, 2001	Sr-90	143.77 ± 3.04	136.82	109.46 - 164.18
SPSO-3356	Soil	Apr, 2001	Co-60	18.49 ± 0.21	19.57	9.57 - 29.57
SPSO-3356	Soil	Apr, 2001	Cs-137	18.71 ± 0.24	16.61	6.61 - 26.61
SPAP-3359	Air Filter	Apr, 2001	Cs-137	1.80 ± 0.01	1.67	1.00 - 2.34
SPW-3376	Water	Apr, 2001	Co-60	48.17 ± 4.85	45.19	35.19 - 55.19
SPW-3376	Water	Apr, 2001	Cs-134	37.14 ± 3.90	33.96	23.96 - 43.96
SPW-3376	Water	Apr, 2001	Sr-90	159.84 ± 3.42	136.82	109.46 - 164.18
SPW-3377	Water	Apr, 2001	I-131	68.60 ± 2.63	85.02	68.02 - 102.02
SPW-3129/1	Water	May, 2001	Gr. Alpha	37.94 ± 2.42	34.57	17.29 - 51.86
SPW-3129/1	Water	May, 2001	Gr. Beta	117.83 ± 2.37	109.46	98.51 - 120.41
SPW-3129/2	Water	Jun, 2001	Gr. Alpha	34.42 ± 2.14	34.57	17.29 - 51.86
SPW-3129/2	Water	Jun, 2001	Gr. Beta	119.99 ± 2.45	109.46	98.51 - 120.41
SPVE-3303	Vegetation	Jun, 2001	I-131(g)	0.81 ± 0.03	0.86	0.51 - 1.20
SPSO-5701	Soil	Jul, 2001	Co-60	17.42 ± 0.19	19.05	9.05 - 29.05
SPSO-5701	Soil	Jul, 2001	Cs-137	16.03 ± 0.22	16.52	6.52 - 26.52
SPW-5779	Water	Jul, 2001	Co-60	250.05 ± 18.63	233.26	209.93 - 256.59
SPW-5779	Water	Jul, 2001	Cs-137	178.68 ± 19.89	175.91	158.32 - 193.50
SPW-5779	Water	Jul, 2001	Sr-90	72.12 ± 2.24	68.12	54.50 - 81.74
SPF-5781	Fish	Jul, 2001	Co-60	1.87 ± 0.08	1.79	1.07 - 2.51
SPF-5781	Fish	Jul, 2001	Cs-137	1.43 ± 0.07	1.39	0.83 - 1.95
SPW-5937	Water	Jul, 2001	H-3	51177.00 ± 631.00	50189.00	40151.20 - 60226.80
SPW-59441	Water	Jul, 2001	Ra-226	36.62 ± 1.74	34.46	24.12 - 44.80
SPW-59441	Water	Jul, 2001	Ra-228	41.46 ± 6.44	36.06	25.24 - 46.88
SPAP-5703	Air Filter	Jul, 2001	Cs-137	1.81 ± 0.02	1.67	1.00 - 2.34
SPW-3129/3	Water	Jul, 2001	Gr. Alpha	35.31 ± 3.04	34.75	17.38 - 52.13

Table A-3. In-house "spike" samples.

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L[a] Laboratory results 2s, n=1[b]	Known Activity	Control[c] Limits
SPW-3129/3	Water	Jul, 2001	Gr. Beta	113.28 ± 3.65	109.46	98.51 - 120.41
SPMI-6145	Milk	Jul, 2001	Cs-137	188.45 ± 19.10	175.91	158.32 - 193.50
SPW-6604	Water	Jul, 2001	Gr. Alpha	35.36 ± 1.94	34.57	17.29 - 51.86
SPW-6604	Water	Jul, 2001	Gr. Beta	112.56 ± 2.46	108.82	97.94 - 119.70
SPW-9008	Water	Oct, 2001	H-3	48285.00 ± 606.10	50189.00	40151.20 - 60226.80
SPAP-9010	Air Filter	Oct, 2001	Cs-137	1.91 ± 0.01	1.67	1.00 - 2.34
SPW-10723	Water	Dec, 2001	U-233/4	40.12 ± 1.09	41.73	25.04 - 58.42
SPW-10723	Water	Dec, 2001	U-238	40.16 ± 1.09	41.73	29.21 - 54.25
SPAP-11550	Air Filter	Dec, 2001	Gr. Beta	1.58 ± 0.02	1.56	-8.44 - 11.56
SPW-11757	Water	Dec, 2001	Co-60	43.82 ± 3.14	41.36	31.36 - 51.36
SPW-11757	Water	Dec, 2001	Cs-134	24.11 ± 2.42	22.59	12.59 - 32.59
SPW-11757	Water	Dec, 2001	Cs-137	52.11 ± 4.40	50.89	40.89 - 60.89
SPMI-11759	Milk	Dec, 2001	Cs-134	28.03 ± 2.64	27.10	17.10 - 37.10
SPMI-11759	Milk	Dec, 2001	Cs-137	54.59 ± 5.08	50.89	40.89 - 60.89
SPF-11761	Fish	Dec, 2001	Cs-134	0.94 ± 0.02	0.90	0.54 - 1.26
SPF-11761	Fish	Dec, 2001	Cs-137	1.43 ± 0.04	1.43	0.86 - 2.00

[a] All results are in pCi/L, except for elemental potassium (K) in milk, which are in mg/L.; air filter samples, which are in pCi/Filter; and food products, which are in pCi/kg.
[b] Results are based on single determinations.
[c] Control limits are based on Attachment A, Page A2 of this report.

NOTE: For fish, Jello is used for the spike matrix. For vegetation, coleslaw is used for the spike matrix.

Table A-4. In-house "blank" samples.

Lab Code	Sample Type	Sample Date	Analysis	Concentration pCi/L[a]. Laboratory results (4.66 Sigma) LLD	Activity[b]	Acceptance Criteria (4.66 Sigma)
SPAP-478	AIR FILTER	Jan 2001	Co-60	< 1.12		<100.0
SPAP-478	AIR FILTER	Jan 2001	Cs-134	< 1.66		<100.0
SPAP-478	AIR FILTER	Jan 2001	Cs-137	< 2.46		<100.0
SPW-480	WATER	Jan 2001	H-3	< 162.00	-1.86 ± 80.40	<200.0
SPW-484	WATER	Jan 2001	Gr. Alpha	< 0.68		<1.0
SPW-484	WATER	Jan 2001	Gr. Beta	< 1.35		<3.2
SPW-484	WATER	Jan 2001	Ra-226	< 0.02	0.03 ± 0.01	<1.0
SPW-484	WATER	Jan 2001	Ra-228	< 0.97	0.43 ± 0.50	<2.0
SPW-486	WATER	Jan 2001	Co-60	< 2.68		<10.0
SPW-486	WATER	Jan 2001	Cs-134	< 3.46		<10.0
SPW-486	WATER	Jan 2001	Cs-137	< 5.43		<10.0
SPW-486	WATER	Jan 2001	Sr-90	< 0.65	0.06 ± 0.31	<1.0
SPAP-755	AIR FILTER	Jan 2001	Gr. Beta	< 1.60	0.16 ± 0.90	<3.2
SPW-1038	WATER	Feb 2001	U-238	< 0.03		<1.0
SPW-1038	WATER	Feb 2001	U-238	< 0.00		<1.0
SPW-1223	WATER	Feb 2001	Gr. Alpha	< 0.46		<1.0
SPW-1223	WATER	Feb 2001	Gr. Beta	< 1.50		<3.2
SPW-1223	WATER	Feb 2001	Ra-226	< 0.02	0.03 ± 0.01	<1.0
SPW-1223	WATER	Feb 2001	Ra-228	< 0.95	0.45 ± 0.49	<2.0
SPMI-1268	MILK	Feb 2001	Cs-134	< 5.86		<10.0
SPMI-1268	MILK	Feb 2001	Cs-137	< 3.02		<10.0
SPMI-1268	MILK	Feb 2001	I-131(g)	< 7.46		<20.0
SPW-1271	WATER	Feb 2001	Co-60	< 1.06		<10.0
SPW-1271	WATER	Feb 2001	Cs-134	< 2.61		<10.0
SPW-1271	WATER	Feb 2001	Cs-137	< 2.37		<10.0
SPVE-1273	VEGETATION	Feb 2001	Cs-134	< 10.04		<100.0
SPVE-1273	VEGETATION	Feb 2001	Cs-137	< 6.00		<100.0
SPCH-1275	CHARCOAL CANISTER	Feb 2001	I-131(g)	< 0.01		<9.6
SPW-2164	WATER	Mar 2001	Ra-226	< 0.02	0.05 ± 0.01	<1.0
SPU-3126	URINE	Apr 2001	H-3	< 642.00	-66.00 ± 335.00	<200.0

2.0 ml. sample volume.

Table A-4. In-house "blank" samples.

Lab Code	Sample Type	Sample Date	Analysis	Concentration pCi/L[a]. Laboratory results (4.66 Sigma) LLD	Activity[b]	Acceptance Criteria (4.66 Sigma)
SPDW-3130	WATER	Apr 2001	Gr. Alpha	< 0.54	0.04 ± 0.38	<1.0
SPDW-3130	WATER	Apr 2001	Gr. Beta	< 1.46	0.67 ± 1.04	<3.2
SPMI-3233	MILK	Apr 2001	Cs-137	< 2.66		<10.0
SPMI-3233	MILK	Apr 2001	I-131	< 0.26	-0.06 ± 0.14	<0.5
SPMI-3233	MILK	Apr 2001	I-131(g)	< 3.91		<20.0
SPMI-3233	MILK	Apr 2001	Sr-89	< 0.79	-0.32 ± 0.79	<5.0
SPMI-3233	MILK	Apr 2001	Sr-90		1.18 ± 0.35	<1.0
Low levels of Sr-90 are still detected in the environment. A concentration of (1-5 pCi/L) in milk is not unusual.						
SPSO-3357	SOIL	Apr 2001	Cs-134	< 14.77		<100.0
SPSO-3357	SOIL	Apr 2001	Cs-137	< 11.72		<100.0
SPAP-3358	AIR FILTER	Apr 2001	Cs-137	< 0.55		<100.0
SPW-3375	WATER	Apr 2001	Co-60	< 2.90		<10.0
SPW-3375	WATER	Apr 2001	Cs-134	< 3.71		<10.0
SPW-3375	WATER	Apr 2001	I-131(g)	< 0.39	0.02 ± 0.22	<20.0
SPW-3375	WATER	Apr 2001	Sr-90	< 0.56	0.05 ± 0.27	<1.0
SPDW-3130	WATER	May 2001	Gr. Alpha	< 0.45	0.15 ± 0.34	<1.0
SPDW-3130	WATER	May 2001	Gr. Beta	< 1.26	0.34 ± 0.95	<3.2
SPDW-3130	WATER	Jun 2001	Gr. Alpha	< 0.44	0.09 ± 0.32	<1.0
SPDW-3130	WATER	Jun 2001	Gr. Beta	< 1.46	0.66 ± 1.04	<3.2
SPVE-3304	VEGETATION	Jun 2001	Co-60	< 7.06		<100.0
SPVE-3304	VEGETATION	Jun 2001	Cs-134	< 11.56		<100.0
SPVE-3304	VEGETATION	Jun 2001	Cs-137	< 8.30		<100.0
SPSO-5702	SOIL	Jul 2001	Co-60	< 12.80		<100.0
SPSO-5702	SOIL	Jul 2001	Cs-134	< 13.96		<100.0
SPSO-5702	SOIL	Jul 2001	Cs-137	< 8.10		<100.0
SPAP-5704	AIR FILTER	Jul 2001	Co-60	< 0.79		<100.0
SPAP-5704	AIR FILTER	Jul 2001	Cs-134	< 0.84		<100.0
SPAP-5704	AIR FILTER	Jul 2001	Cs-137	< 0.60		<100.0
SPW-5780	WATER	Jul 2001	Co-60	< 1.86		<10.0
SPW-5780	WATER	Jul 2001	Cs-134	< 2.46		<10.0
SPW-5780	WATER	Jul 2001	Cs-137	< 3.77		<10.0

Table A-4. In-house "blank" samples.

Lab Code	Sample Type	Sample Date	Analysis	Concentration pCi/L[a]. Laboratory results (4.66 Sigma) LLD	Activity[b]	Acceptance Criteria (4.66 Sigma)
SPF-5782	FISH	Jul 2001	Co-60	< 5.64		<100.0
SPF-5782	FISH	Jul 2001	Cs-134	< 7.51		<100.0
SPW-5938	WATER	Jul 2001	H-3	< 163.22	-16.21 ± 85.07	<200.0
SPW-59451	WATER	Jul 2001	Ra-226	< 0.01	0.04 ± 0.01	<1.0
SPW-59451	WATER	Jul 2001	Ra-228	< 0.77	0.70 ± 0.44	<2.0
SPDW-3130	WATER	Jul 2001	Gr. Alpha	< 0.54	0.36 ± 0.40	<1.0
SPDW-3130	WATER	Jul 2001	Gr. Beta	< 2.27	-0.78 ± 1.35	<3.2
SPMI-6146	MILK	Jul 2001	Sr-90	< 0.50	1.09 ± 0.36	<1.0
Low levels of Sr-90 are still detected in the environment. A concentration of (1-5 pCi/L) in milk is not unusual.						
SPW-6605	WATER	Jul 2001	Gr. Beta	< 1.34	0.55 ± 1.01	<3.2
SPW-9009	WATER	Oct 2001	H-3	< 160.00	-56.70 ± 76.50	<200.0
SPAP-9011	AIR FILTER	Oct 2001	Co-60	< 0.76		<100.0
SPAP-9011	AIR FILTER	Oct 2001	Cs-137	< 0.58		<100.0
SPW-5780	WATER	Oct 2001	Sr-90	< 0.54	0.36 ± 0.30	<1.0
SPW-10724	WATER	Dec 2001	U-238	< 0.13	0.04 ± 0.10	<1.0
SPAP-11549	AIR FILTER	Dec 2001	Gr. Beta	< 0.00	0.01 ± 0.00	<3.2
SPW-11756	WATER	Dec 2001	Cs-137	< 2.62		<10.0
SPMI-11758	MILK	Dec 2001	Cs-137	< 4.00		<10.0
SPMI-11758	MILK	Dec 2001	I-131(g)	< 16.57		<20.0
SPF-11760	FISH	Dec 2001	Cs-137	< 7.96		<100.0

[a] Liquid sample results are reported in pCi/Liter, air filter sample results are in pCi/filter, charcoal sample results are in pCi/charcoal, and solid sample results are in pCi/kilogram.
[b] The activity reported is the net activity result.

Table A-5. In-house "duplicate" samples.

Lab Codes	Sample Date	Analysis	Concentration in pCi/L[a] First Result	Second Result	Averaged Result
AP-10675, 10676	Jan, 2001	Be-7	0.06 ± 0.02	0.06 ± 0.02	0.06 ± 0.01
AP-10803, 10804	Jan, 2001	Be-7	0.04 ± 0.01	0.04 ± 0.01	0.04 ± 0.01
AP-10833, 10834	Jan, 2001	Be-7	0.04 ± 0.01	0.04 ± 0.01	0.04 ± 0.01
WW-51, 52	Jan, 2001	H-3	362.60 ± 94.70	417.20 ± 96.80	389.90 ± 67.71
MI-72, 73	Jan, 2001	K-40	1,566.90 ± 196.80	1,372.40 ± 152.50	1,469.65 ± 124.49
MI-96, 97	Jan, 2001	K-40	1,418.30 ± 117.80	1,545.70 ± 162.50	1,482.00 ± 100.35
U-858, 859	Jan, 2001	Gr. Beta	2.17 ± 2.47	4.23 ± 2.74	3.20 ± 1.84
MI-389, 390	Jan, 2001	K-40	1,489.20 ± 141.10	1,463.30 ± 168.20	1,476.25 ± 109.77
DW-879, 880	Jan, 2001	Gr. Beta	2.63 ± 0.52	2.37 ± 0.50	2.50 ± 0.36
SWU-813, 814	Jan, 2001	Gr. Beta	2.48 ± 0.58	2.46 ± 0.63	2.47 ± 0.43
MI-708, 709	Feb, 2001	K-40	1,179.40 ± 103.00	1,280.40 ± 90.26	1,229.90 ± 68.48
MI-740, 741	Feb, 2001	I-131	0.01 ± 0.26	-0.12 ± 0.26	-0.05 ± 0.18
MI-740, 741	Feb, 2001	K-40	1,434.00 ± 156.50	1,435.00 ± 126.10	1,434.50 ± 100.49
MI-789, 790	Feb, 2001	K-40	1,584.30 ± 158.80	1,390.70 ± 136.50	1,487.50 ± 104.70
DW-901, 902	Feb, 2001	Gr. Beta	4.67 ± 1.08	5.54 ± 1.13	5.11 ± 0.78
SWU-1544, 1545	Feb, 2001	Gr. Beta	3.13 ± 0.63	2.33 ± 0.52	2.73 ± 0.41
DW-1426, 1427	Feb, 2001	Gr. Beta	2.05 ± 0.92	2.34 ± 0.93	2.20 ± 0.65
DW-1426, 1427	Feb, 2001	H-3	42.60 ± 94.23	131.31 ± 95.34	86.96 ± 67.02
WW-1476, 1477	Feb, 2001	H-3	53.06 ± 65.79	53.06 ± 93.03	53.06 ± 56.97
MI-1523, 1524	Mar, 2001	I-131	-0.01 ± 0.20	-0.10 ± 0.37	-0.06 ± 0.21
MI-1523, 1524	Mar, 2001	K-40	1,396.00 ± 184.80	1,576.00 ± 184.90	1,486.00 ± 130.71
MI-1572, 1573	Mar, 2001	K-40	1,499.20 ± 113.30	1,326.00 ± 118.80	1,412.60 ± 82.08
MI-1572, 1573	Mar, 2001	Sr-90	1.65 ± 0.44	1.51 ± 0.52	1.58 ± 0.34
SW-1648, 1649	Mar, 2001	K-40	297.80 ± 67.20	344.80 ± 82.30	321.30 ± 53.13
MI-1800, 1801	Mar, 2001	K-40	1,425.80 ± 183.30	1,372.20 ± 119.70	1,399.00 ± 109.46
SW-1779, 1780	Mar, 2001	Gr. Alpha	2.22 ± 0.73	2.14 ± 0.69	2.18 ± 0.50
SW-1779, 1780	Mar, 2001	Gr. Beta	6.28 ± 0.74	6.62 ± 0.70	6.45 ± 0.51
MI-1447, 1448	Mar, 2001	I-131	-0.65 ± 0.27	0.13 ± 0.55	-0.26 ± 0.31
MI-1447, 1448	Mar, 2001	K-40	1,496.20 ± 155.40	1,413.40 ± 169.60	1,454.80 ± 115.01
WW-2115, 2116	Mar, 2001	H-3	540.04 ± 111.84	500.85 ± 110.46	520.44 ± 78.59
SW-1698, 1699	Mar, 2001	Gr. Beta	6.07 ± 1.75	5.57 ± 1.85	5.82 ± 1.27
DW-2272, 2273	Mar, 2001	Gr. Beta	2.10 ± 0.86	1.63 ± 0.83	1.87 ± 0.60
WW-2356, 2357	Mar, 2001	Gr. Beta	1.22 ± 0.50	1.32 ± 0.47	1.27 ± 0.35
AP-2812, 2813	Mar, 2001	Be-7	0.07 ± 0.02	0.05 ± 0.01	0.06 ± 0.01
AP-2812, 2813	Mar, 2001	Be-7	0.07 ± 0.02	0.05 ± 0.01	0.06 ± 0.01
LW-2217, 2218	Mar, 2001	Gr. Beta	1.85 ± 0.51	2.23 ± 0.55	2.04 ± 0.37

Table A-5. In-house "duplicate" samples.

Lab Codes	Sample Date	Analysis	Concentration in pCi/L[a] First Result	Second Result	Averaged Result
AP-2833, 2834	Mar, 2001	Be-7	0.04 ± 0.01	0.06 ± 0.02	0.05 ± 0.01
AP-3038, 3039	Mar, 2001	Be-7	0.07 ± 0.02	0.07 ± 0.02	0.07 ± 0.01
AP-3038, 3039	Mar, 2001	Be-7	0.06 ± 0.02	0.07 ± 0.01	0.07 ± 0.01
DW-2398, 2399	Mar, 2001	Gr. Beta	1.58 ± 0.89	1.81 ± 0.88	1.69 ± 0.63
LW-2467, 2468	Mar, 2001	Gr. Beta	2.52 ± 0.53	2.42 ± 0.53	2.47 ± 0.37
MI-2446, 2447	Apr, 2001	K-40	1,285.40 ± 177.10	1,376.00 ± 175.90	1,330.70 ± 124.81
AP-3017, 3018	Apr, 2001	Be-7	0.05 ± 0.01	0.05 ± 0.01	0.05 ± 0.00
SW-2423, 2424	Apr, 2001	K-40	255.60 ± 59.80	268.40 ± 65.40	262.00 ± 44.31
BS-3103, 3104	Apr, 2001	Gr. Beta	7.99 ± 1.80	8.17 ± 1.73	8.08 ± 1.25
SWU-3239, 3240	Apr, 2001	Gr. Beta	3.30 ± 0.60	4.30 ± 0.74	3.80 ± 0.48
SS-3322, 3323	Apr, 2001	K-40	15.99 ± 1.08	15.59 ± 1.01	15.79 ± 0.74
W-3990, 3991	Apr, 2001	Sr-89	91.35 ± 18.94	85.29 ± 23.99	88.32 ± 15.28
BS-4347, 4348	Apr, 2001	K-40	3,982.40 ± 489.60	3,255.80 ± 450.10	3,619.10 ± 332.53
BS-4347, 4348	Apr, 2001	K-40	3.26 ± 0.45	3.98 ± 0.49	3.62 ± 0.33
MI-3364, 3365	May, 2001	K-40	1,325.90 ± 160.20	1,453.20 ± 163.00	1,389.55 ± 114.27
SO-3385, 3386	May, 2001	Gr. Alpha	6.51 ± 3.09	9.01 ± 3.44	7.76 ± 2.31
SO-3385, 3386	May, 2001	Gr. Beta	24.63 ± 3.15	28.17 ± 3.12	26.40 ± 2.22
SO-3385, 3386	May, 2001	K-40	19.17 ± 1.08	17.94 ± 0.76	18.56 ± 0.66
CL-4068, 4069	May, 2001	K-40	1.09 ± 0.27	1.13 ± 0.23	1.11 ± 0.18
MI-3475, 3476	May, 2001	Gr. Beta	1,297.10 ± 114.60	1,433.60 ± 156.60	1,365.35 ± 97.03
WW-3545, 3546	May, 2001	Gr. Beta	1.57 ± 0.55	1.36 ± 0.53	1.47 ± 0.38
MI-3681, 3682	May, 2001	K-40	1,417.20 ± 125.70	1,496.20 ± 124.50	1,456.70 ± 88.46
SW-3702, 3703	May, 2001	Gr. Alpha	4.51 ± 1.66	3.22 ± 1.55	3.87 ± 1.13
SW-3702, 3703	May, 2001	Gr. Beta	8.74 ± 1.36	7.11 ± 1.38	7.93 ± 0.97
BS-4021, 4022	May, 2001	Cs-137	224.30 ± 30.20	205.90 ± 43.00	215.10 ± 26.27
BS-4021, 4022	May, 2001	H-3	842.00 ± 47.00	860.00 ± 48.00	851.00 ± 33.59
BS-4021, 4022	May, 2001	K-40	21,117.00 ± 953.00	21,629.00 ± 1,357.00	21,373.00 ± 829.10
BS-4021, 4022	May, 2001	Pu-238	80.30 ± 36.50	59.50 ± 22.00	69.90 ± 21.31
BS-4021, 4022	May, 2001	Pu-239/40	49.40 ± 31.80	41.10 ± 19.60	45.25 ± 18.68
BS-4021, 4022	May, 2001	Ra-226	7,436.00 ± 577.90	9,126.00 ± 751.90	8,281.00 ± 474.16
BS-4021, 4022	May, 2001	Sr-90	10.60 ± 2.71	16.80 ± 3.22	13.70 ± 2.10
F-3813, 3814	May, 2001	K-40	2.10 ± 0.17	2.30 ± 0.26	2.20 ± 0.16
G-4158, 4159	May, 2001	Be-7	0.37 ± 0.13	0.41 ± 0.14	0.39 ± 0.10
SO-4179, 4180	May, 2001	Ac-228	0.45 ± 0.13	0.52 ± 0.14	0.49 ± 0.10
SO-4179, 4180	May, 2001	Bi-214	0.31 ± 0.06	0.41 ± 0.06	0.36 ± 0.04
SO-4179, 4180	May, 2001	Cs-137	0.46 ± 0.05	0.47 ± 0.04	0.47 ± 0.03

Table A-5. In-house "duplicate" samples.

			Concentration in pCi/L[a]		
Lab Codes	Sample Date	Analysis	First Result	Second Result	Averaged Result
SO-4179, 4180	May, 2001	Gr. Beta	26.65 ± 2.63	24.68 ± 2.52	25.67 ± 1.82
SO-4179, 4180	May, 2001	K-40	16.35 ± 0.86	16.05 ± 0.82	16.20 ± 0.59
SO-4179, 4180	May, 2001	Pb-212	0.35 ± 0.04	0.43 ± 0.05	0.39 ± 0.03
SO-4179, 4180	May, 2001	Ra-226	0.56 ± 0.98	1.03 ± 0.31	0.79 ± 0.51
SO-4179, 4180	May, 2001	Tl-208	0.14 ± 0.03	0.17 ± 0.03	0.15 ± 0.02
BS-4233, 4234	May, 2001	Cs-137	0.03 ± 0.01	0.03 ± 0.02	0.03 ± 0.01
BS-4233, 4234	May, 2001	K-40	8.18 ± 0.48	7.80 ± 0.58	7.99 ± 0.38
SWU-4376, 4377	May, 2001	Gr. Beta	2.58 ± 0.55	2.94 ± 0.58	2.76 ± 0.40
DW-4449, 4450	May, 2001	Gr. Beta	2.83 ± 0.55	3.74 ± 0.65	3.29 ± 0.43
DW-4397, 4398	May, 2001	Gr. Beta	9.13 ± 1.26	10.20 ± 1.34	9.66 ± 0.92
MI-4114, 4115	May, 2001	K-40	1,325.90 ± 118.80	1,394.70 ± 133.10	1,360.30 ± 89.20
F-4284, 4285	May, 2001	K-40	2.23 ± 0.32	2.12 ± 0.35	2.18 ± 0.24
DW-4326, 4327	Jun, 2001	Gr. Beta	2.60 ± 0.97	1.47 ± 0.83	2.04 ± 0.64
MI-4470, 4471	Jun, 2001	K-40	1,514.50 ± 116.60	1,456.80 ± 130.90	1,485.65 ± 87.65
SW-4493, 4494	Jun, 2001	Gr. Beta	4.05 ± 1.23	4.64 ± 1.32	4.35 ± 0.90
BS-4725, 4726	Jun, 2001	Co-60	112.00 ± 24.30	84.50 ± 8.70	98.25 ± 12.91
BS-4725, 4726	Jun, 2001	Cs-137	3,083.10 ± 100.10	3,094.80 ± 35.30	3,088.95 ± 53.07
BS-4725, 4726	Jun, 2001	K-40	8,143.70 ± 640.40	8,083.80 ± 225.10	8,113.75 ± 339.40
MI-4775, 4776	Jun, 2001	K-40	1,362.20 ± 71.80	1,363.90 ± 73.40	1,363.05 ± 51.34
WW-5110, 5111	Jun, 2001	H-3	1,173.50 ± 129.10	1,046.80 ± 125.20	1,110.15 ± 89.92
G-5085, 5086	Jun, 2001	Be-7	0.89 ± 0.17	1.14 ± 0.39	1.02 ± 0.21
G-5085, 5086	Jun, 2001	K-40	5.13 ± 0.39	5.22 ± 0.70	5.17 ± 0.40
MI-5259, 5260	Jun, 2001	K-40	1,529.70 ± 122.70	1,406.20 ± 123.80	1,467.95 ± 87.15
MI-5259, 5260	Jun, 2001	Sr-90	1.69 ± 0.42	1.71 ± 0.44	1.70 ± 0.30
SWU-5422, 5423	Jun, 2001	Gr. Beta	2.59 ± 0.54	1.91 ± 0.52	2.25 ± 0.37
VE-5401, 5402	Jun, 2001	Gr. Beta	8.12 ± 0.24	8.88 ± 0.26	8.50 ± 0.18
VE-5401, 5402	Jun, 2001	K-40	6.55 ± 0.52	6.26 ± 0.65	6.40 ± 0.42
AP-5830, 5831	Jun, 2001	Be-7	0.08 ± 0.01	0.08 ± 0.01	0.08 ± 0.01
SW-5557, 5558	Jun, 2001	Gr. Beta	5.43 ± 1.70	5.96 ± 1.56	5.70 ± 1.15
AP-5851, 5852	Jun, 2001	Be-7	0.07 ± 0.02	0.07 ± 0.02	0.07 ± 0.01
SW-5636, 5637	Jun, 2001	Gr. Beta	4.75 ± 1.38	4.18 ± 1.34	4.47 ± 0.96
LW-5681, 5682	Jun, 2001	Gr. Beta	2.42 ± 0.37	2.18 ± 0.34	2.30 ± 0.25
G-5535, 5536	Jul, 2001	Be-7	0.99 ± 0.29	0.97 ± 0.54	0.98 ± 0.31
G-5535, 5536	Jul, 2001	Gr. Beta	7.62 ± 0.12	7.72 ± 0.12	7.67 ± 0.08
G-5535, 5536	Jul, 2001	K-40	7.26 ± 1.03	7.64 ± 0.93	7.45 ± 0.69
AP-5788, 5789	Jul, 2001	Be-7	0.08 ± 0.02	0.07 ± 0.02	0.08 ± 0.01

Table A-5. In-house "duplicate" samples.

Lab Codes	Sample Date	Analysis	Concentration in pCi/L[a] First Result	Second Result	Averaged Result
AP-5872, 5873	Jul, 2001	Be-7	0.07 ± 0.02	0.08 ± 0.02	0.07 ± 0.01
AP-5893, 5894	Jul, 2001	Be-7	0.08 ± 0.02	0.08 ± 0.01	0.08 ± 0.01
AP-5809, 5810	Jul, 2001	Be-7	0.07 ± 0.02	0.06 ± 0.01	0.06 ± 0.01
SW-5724, 5725	Jul, 2001	Gr. Alpha	2.95 ± 0.70	2.89 ± 0.60	2.92 ± 0.46
SW-5724, 5725	Jul, 2001	Gr. Beta	8.79 ± 0.71	8.21 ± 0.65	8.50 ± 0.48
SW-5767, 5768	Jul, 2001	I-131	0.79 ± 0.31	0.61 ± 0.26	0.70 ± 0.20
LW-5920, 5921	Jul, 2001	Gr. Beta	3.06 ± 0.64	3.15 ± 0.58	3.11 ± 0.43
SO-6172, 6173	Jul, 2001	Cs-137	0.30 ± 0.05	0.32 ± 0.04	0.31 ± 0.03
SO-6172, 6173	Jul, 2001	K-40	18.20 ± 1.08	17.55 ± 0.82	17.88 ± 0.68
SO-6172, 6173	Jul, 2001	Sr-90	0.03 ± 0.01	0.05 ± 0.02	0.04 ± 0.01
MI-6353, 6354	Jul, 2001	K-40	966.35 ± 82.28	986.31 ± 91.91	976.33 ± 61.68
SW-6376, 6377	Jul, 2001	I-131	0.58 ± 0.16	0.81 ± 0.17	0.70 ± 0.12
VE-6424, 6425	Jul, 2001	Gr. Beta	2.52 ± 0.05	2.49 ± 0.05	2.51 ± 0.03
VE-6424, 6425	Jul, 2001	K-40	3.04 ± 0.26	3.12 ± 0.37	3.08 ± 0.23
MI-6445, 6446	Jul, 2001	K-40	1,407.40 ± 97.10	1,442.20 ± 189.60	1,424.80 ± 106.51
LW-6489, 6490	Jul, 2001	Gr. Beta	2.61 ± 0.57	2.79 ± 0.54	2.70 ± 0.39
MI-6533, 6534	Jul, 2001	K-40	1,498.60 ± 113.90	1,375.50 ± 129.60	1,437.05 ± 86.27
DW-6835, 6836	Jul, 2001	Gr. Beta	2.01 ± 0.59	2.36 ± 0.63	2.19 ± 0.43
MI-6693, 6694	Aug, 2001	K-40	1,294.30 ± 118.70	1,417.30 ± 176.50	1,355.80 ± 106.35
MI-6693, 6694	Aug, 2001	Sr-90	1.47 ± 0.42	1.23 ± 0.41	1.35 ± 0.29
WW-6952, 6953	Aug, 2001	Gr. Beta	5.49 ± 0.69	5.80 ± 0.69	5.64 ± 0.49
MI-6906, 6907	Aug, 2001	K-40	1,613.80 ± 218.50	1,532.70 ± 135.80	1,573.25 ± 128.63
VE-6973, 6974	Aug, 2001	K-40	4.21 ± 0.24	4.29 ± 0.64	4.25 ± 0.34
LW-7851, 7852	Aug, 2001	Gr. Beta	2.20 ± 0.48	2.12 ± 0.42	2.16 ± 0.32
MI-7001, 7002	Aug, 2001	K-40	1,453.80 ± 148.10	1,285.30 ± 190.50	1,369.55 ± 120.65
MI-7073, 7074	Aug, 2001	K-40	1,217.30 ± 80.83	1,218.30 ± 99.13	1,217.80 ± 63.95
LW-7145, 7146	Aug, 2001	Gr. Beta	2.77 ± 0.53	3.60 ± 0.59	3.19 ± 0.39
MI-7221, 7222	Aug, 2001	K-40	1,192.90 ± 95.40	1,388.90 ± 132.70	1,290.90 ± 81.72
MI-7221, 7222	Aug, 2001	Sr-90	2.10 ± 0.48	1.72 ± 0.47	1.91 ± 0.34
SWU-7527, 7528	Aug, 2001	Gr. Beta	17.51 ± 3.06	20.36 ± 3.31	18.93 ± 2.25
VE-7485, 7486	Aug, 2001	K-40	2.12 ± 0.47	2.47 ± 0.34	2.30 ± 0.29
DW-7506, 7507	Aug, 2001	Gr. Beta	4.25 ± 1.18	4.13 ± 1.12	4.19 ± 0.81
MI-7622, 7623	Sep, 2001	K-40	1,340.10 ± 111.10	1,290.80 ± 116.50	1,315.45 ± 80.49
MI-7664, 7665	Sep, 2001	K-40	1,408.10 ± 102.70	1,396.90 ± 114.30	1,402.50 ± 76.83
MI-7876, 7877	Sep, 2001	K-40	1,416.40 ± 192.30	1,318.00 ± 155.50	1,367.20 ± 123.65
G-7960, 7961	Sep, 2001	Be-7	1.27 ± 0.21	1.25 ± 0.25	1.26 ± 0.16

Table A-5. In-house "duplicate" samples.

Lab Codes	Sample Date	Analysis	Concentration in pCi/L[a] First Result	Second Result	Averaged Result
G-7960, 7961	Sep, 2001	K-40	5.21 ± 0.57	5.70 ± 0.63	5.45 ± 0.43
F-8011, 8012	Sep, 2001	Cs-137	0.06 ± 0.02	0.04 ± 0.02	0.05 ± 0.01
F-8011, 8012	Sep, 2001	Gr. Beta	3.68 ± 0.12	3.50 ± 0.11	3.59 ± 0.08
F-8011, 8012	Sep, 2001	K-40	3.47 ± 0.49	3.38 ± 0.47	3.43 ± 0.34
MI-8149, 8150	Sep, 2001	K-40	1,551.70 ± 118.00	1,489.90 ± 123.60	1,520.80 ± 85.44
MI-8343, 8344	Sep, 2001	K-40	1,550.30 ± 170.60	1,368.10 ± 126.70	1,459.20 ± 106.25
VE-8319, 8320	Sep, 2001	Gr. Beta	3.37 ± 0.10	3.42 ± 0.11	3.39 ± 0.07
VE-8319, 8320	Sep, 2001	K-40	2.14 ± 0.46	2.24 ± 0.37	2.19 ± 0.29
AP-9069, 9070	Sep, 2001	Be-7	0.07 ± 0.02	0.07 ± 0.01	0.07 ± 0.01
AP-9566, 9567	Sep, 2001	Be-7	0.08 ± 0.02	0.09 ± 0.03	0.09 ± 0.02
VE-8700, 8701	Oct, 2001	Be-7	0.24 ± 0.10	0.19 ± 0.10	0.22 ± 0.07
VE-8700, 8701	Oct, 2001	K-40	2.03 ± 0.24	2.03 ± 0.21	2.03 ± 0.16
VE-8700, 8701	Oct, 2001	Sr-90	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00
AP-9048, 9049	Oct, 2001	Be-7	0.07 ± 0.01	0.07 ± 0.00	0.07 ± 0.01
DW-8636, 8637	Oct, 2001	Gr. Beta	4.74 ± 1.06	5.08 ± 1.21	4.91 ± 0.80
DW-8615, 8616	Oct, 2001	Gr. Beta	4.65 ± 0.58	4.28 ± 0.54	4.47 ± 0.40
AP-9090, 9091	Oct, 2001	Be-7	0.07 ± 0.01	0.07 ± 0.01	0.07 ± 0.01
AP-9166, 9167	Oct, 2001	Be-7	0.08 ± 0.02	0.08 ± 0.02	0.08 ± 0.01
AP-9187, 9188	Oct, 2001	Be-7	0.07 ± 0.01	0.05 ± 0.01	0.06 ± 0.01
VE-10562, 10563	Oct, 2001	Be-7	309.90 ± 158.80	348.30 ± 168.10	329.10 ± 115.62
VE-10562, 10563	Oct, 2001	K-40	6,407.10 ± 620.70	6,057.50 ± 660.40	6,232.30 ± 453.15
WW-8636, 8637	Oct, 2001	Gr. Beta	5.08 ± 1.20	4.74 ± 1.06	4.91 ± 0.80
DW-8894, 8895	Oct, 2001	Gr. Beta	4.28 ± 0.89	3.40 ± 0.90	3.84 ± 0.63
MI-9232, 9233	Oct, 2001	K-40	1,440.70 ± 46.60	1,424.80 ± 76.40	1,432.75 ± 44.75
VE-9518, 9519	Oct, 2001	K-40	1.91 ± 0.22	1.97 ± 0.39	1.94 ± 0.22
WW-10257, 10258	Nov, 2001	H-3	755.90 ± 102.50	684.70 ± 99.90	720.30 ± 71.57
VE-10333, 10334	Nov, 2001	Be-7	0.68 ± 0.26	0.99 ± 0.26	0.84 ± 0.18
VE-10333, 10334	Nov, 2001	K-40	6.10 ± 0.72	5.83 ± 0.72	5.97 ± 0.51
MI-10588, 10589	Nov, 2001	K-40	1,428.40 ± 114.70	1,445.50 ± 129.40	1,436.95 ± 86.46
DW-10688, 10689	Nov, 2001	Gr. Beta	3.49 ± 0.91	2.36 ± 0.76	2.93 ± 0.60
WW-10905, 10906	Dec, 2001	H-3	233.90 ± 90.60	226.30 ± 90.20	230.10 ± 63.92
SS-10953, 10954	Dec, 2001	Ac-228	1.10 ± 0.25	0.91 ± 0.16	1.00 ± 0.15
SS-10953, 10954	Dec, 2001	Bi-214	0.69 ± 0.08	0.75 ± 0.08	0.72 ± 0.06
SS-10953, 10954	Dec, 2001	Co-58	0.21 ± 0.05	0.18 ± 0.04	0.19 ± 0.03
SS-10953, 10954	Dec, 2001	Co-60	0.93 ± 0.06	0.94 ± 0.06	0.93 ± 0.04
SS-10953, 10954	Dec, 2001	Cs-137	0.13 ± 0.03	0.16 ± 0.03	0.14 ± 0.02

Table A-5. In-house "duplicate" samples.

Lab Codes	Sample Date	Analysis	Concentration in pCi/L[a] First Result	Second Result	Averaged Result
SS-10953, 10954	Dec, 2001	K-40	9.91 ± 0.83	8.36 ± 0.80	9.13 ± 0.57
SS-10953, 10954	Dec, 2001	Pb-212	0.94 ± 0.05	0.91 ± 0.06	0.92 ± 0.04
SS-10953, 10954	Dec, 2001	Pb-214	0.83 ± 0.08	0.82 ± 0.07	0.83 ± 0.05
SS-10953, 10954	Dec, 2001	Ra-226	1.76 ± 0.37	1.67 ± 0.37	1.72 ± 0.26
SS-10953, 10954	Dec, 2001	Tl-208	0.34 ± 0.05	0.31 ± 0.05	0.32 ± 0.04
MI-11033, 11034	Dec, 2001	K-40	1,339.80 ± 128.70	1,435.80 ± 117.30	1,387.80 ± 87.07
MI-11033, 11034	Dec, 2001	Sr-90	1.31 ± 0.41	1.38 ± 0.37	1.35 ± 0.28
AP-11888, 11889	Dec, 2001	Be-7	0.06 ± 0.02	0.06 ± 0.02	0.06 ± 0.01

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

[a] Results are reported in units of pCi/L, except for elemental potassium (K) in milk (mg/L), air filters (pCi/Filter), food products and vegetation (pCi/g), soil and sediments (pCi/kg).

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

Lab Code	Sample Type	Date Collected	Analysis	Concentration[b] Laboratory result[c]	MAPEP Result[d] 1s, N=1	Control Limits
STSO-923	SOIL	Jan, 2001	Am-241			0.0 - 2.6
Included in the testing series as a "false positive". No activity expected. Result of analysis; < 0.8 Bq/L.						
STSO-923	SOIL	Jan, 2001	Co-57	100.2 ± 3.5	103.0± 10.3	72.1 - 133.9
STSO-923	SOIL	Jan, 2001	Co-60	1,285.1 ± 5.3	1,270.0± 127.0	889.0 - 1,651.0
STSO-923	SOIL	Jan, 2001	Cs-134	81.1 ± 1.8	91.1± 9.1	63.8 - 118.4
STSO-923	SOIL	Jan, 2001	Cs-137	1,210.6 ± 6.6	1,240.0± 124.0	868.0 - 1,612.0
STSO-923	SOIL	Jan, 2001	K-40	732.6 ± 21.2	652.0± 65.2	456.4 - 847.6
STSO-923	SOIL	Jan, 2001	Mn-54	212.6 ± 6.7	203.0± 20.3	142.1 - 263.9
STSO-923	SOIL	Jan, 2001	Pu-238	110.7 ± 7.2	115.0± 11.5	80.5 - 149.5
STSO-923	SOIL	Jan, 2001	Pu-239/40	79.6 ± 5.9	83.4± 8.3	58.4 - 108.4
STSO-923	SOIL	Jan, 2001	Sr-90	159.8 ± 9.5	209.0± 20.9	146.3 - 271.7
STSO-923	SOIL	Jan, 2001	U-233/4	45.0 ± 3.9	60.0± 6.0	42.0 - 78.0
STSO-923	SOIL	Jan, 2001	U-238	165.6 ± 7.4	191.0± 19.1	133.7 - 248.3
STSO-923	SOIL	Jan, 2001	Zn-65	428.5 ± 10.9	382.0± 38.2	267.4 - 496.6

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

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

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

Table A-7. Environmental Measurements Laboratory Quality Assessment Program (EML)[a].

Lab Code	Sample Type	Date Collected	Analysis	Concentration [b] Laboratory result	EML Result[c]	Control Limits[d]
STSO-904	SOIL	Mar, 2001	Ac-228	45.60 ± 4.0	42.70	0.80 - 1.50
STSO-904	SOIL	Mar, 2001	Am-241	14.40 ± 0.5	14.80	0.63 - 2.64
STSO-904	SOIL	Mar, 2001	Bi-212	53.20 ± 3.1	42.00	0.45 - 1.23
Naturally-occurring radium and thorium daughters are present in the shield background, and a probable cause of the higher bias seen for isotopes of lead and bismuth.						
STSO-904	SOIL	Mar, 2001	Bi-214	42.10 ± 7.7	32.60	0.78 - 1.50
STSO-904	SOIL	Mar, 2001	Cs-137	1,772.60 ± 79.8	1,740.00	0.80 - 1.29
STSO-904	SOIL	Mar, 2001	K-40	583.80 ± 52.6	468.00	0.80 - 1.37
STSO-904	SOIL	Mar, 2001	Pb-212	46.60 ± 8.5	41.50	0.74 - 1.36
STSO-904	SOIL	Mar, 2001	Pb-214	45.30 ± 8.6	34.30	0.76 - 1.53
STSO-904	SOIL	Mar, 2001	Pu-239/40	26.00 ± 0.8	25.60	0.71 - 1.33
STSO-904	SOIL	Mar, 2001	Sr-90	55.60 ± 2.2	69.00	0.61 - 3.91
STW-905	WATER	Mar, 2001	Am-241	2.15 ± 0.1	1.67	0.76 - 1.48
STW-905	WATER	Mar, 2001	Co-60	97.00 ± 0.8	98.20	0.80 - 1.20
STW-905	WATER	Mar, 2001	Cs-137	70.10 ± 4.0	73.00	0.80 - 1.20
STW-905	WATER	Mar, 2001	H-3	76.50 ± 5.5	79.30	0.74 - 2.29
STW-905	WATER	Mar, 2001	Pu-238	1.69 ± 0.1	1.58	0.74 - 1.22
STW-905	WATER	Mar, 2001	Pu-239/40	1.69 ± 0.1	1.64	0.75 - 1.26
STW-905	WATER	Mar, 2001	Sr-90	3.85 ± 0.1	4.40	0.64 - 1.50
STW-905	WATER	Mar, 2001	U-233/4	0.90 ± 0.1	1.04	0.80 - 1.40
STW-905	WATER	Mar, 2001	U-238	0.88 ± 0.1	1.04	0.80 - 1.29
STW-906	WATER	Mar, 2001	Gr. Alpha	1,724.60 ± 141.7	1,900.00	0.58 - 1.26
STW-906	WATER	Mar, 2001	Gr. Beta	1,246.40 ± 31.1	1,297.00	0.56 - 1.50
STAP-907	AIR FILTER	Mar, 2001	Am-241	0.47 ± 0.0	0.49	0.69 - 2.40
STAP-907	AIR FILTER	Mar, 2001	Co-60	20.11 ± 0.2	19.44	0.79 - 1.30
STAP-907	AIR FILTER	Mar, 2001	Cs-134	2.71 ± 0.2	2.83	0.74 - 1.21
STAP-907	AIR FILTER	Mar, 2001	Cs-137	9.86 ± 0.2	8.76	0.78 - 1.35
STAP-907	AIR FILTER	Mar, 2001	Mn-54	7.25 ± 0.2	6.52	0.80 - 1.36
STAP-907	AIR FILTER	Mar, 2001	Pu-238	0.23 ± 0.0	0.22	0.66 - 1.35
STAP-907	AIR FILTER	Mar, 2001	Pu-239/40	0.12 ± 0.0	0.14	0.69 - 1.29

Table A-7. Environmental Measurements Laboratory Quality Assessment Program (EML)[a].

Lab Code	Sample Type	Date Collected	Analysis	Concentration [b] Laboratory result	EML Result[c]	Control Limits[d]
STAP-907	AIR FILTER	Mar, 2001	Sr-90	7.41 ± 0.2	7.10	0.55 - 2.05
STAP-907	AIR FILTER	Mar, 2001	U-233/4	0.05 ± 0.0	0.05	0.80 - 1.92
STAP-907	AIR FILTER	Mar, 2001	U-238	0.05 ± 0.0	0.05	0.80 - 1.59
STAP-908	AIR FILTER	Mar, 2001	Gr. Alpha	2.66 ± 0.0	3.97	0.57 - 1.47
STAP-908	AIR FILTER	Mar, 2001	Gr. Beta	2.30 ± 0.0	2.58	0.76 - 1.52
STVE-909	VEGETATION	Mar, 2001	Am-241	6.10 ± 0.2	6.17	0.72 - 2.34
STVE-909	VEGETATION	Mar, 2001	Cm-244	3.50 ± 0.5	3.69	0.61 - 1.61
STVE-909	VEGETATION	Mar, 2001	Co-60	28.50 ± 2.1	30.40	0.75 - 1.51
STVE-909	VEGETATION	Mar, 2001	Cs-137	795.50 ± 76.4	842.00	0.80 - 1.37
STVE-909	VEGETATION	Mar, 2001	K-40	592.60 ± 42.5	603.00	0.78 - 1.43
STVE-909	VEGETATION	Mar, 2001	Pu-239/40	8.50 ± 0.6	9.58	0.67 - 1.49
STVE-909	VEGETATION	Mar, 2001	Sr-90	1,239.60 ± 130.0	1,330.00	0.52 - 1.23
STW-925	WATER	Sep, 2001	Am-241	0.70 ± 0.1	0.76	0.76 - 1.48
STW-925	WATER	Sep, 2001	Co-60	206.70 ± 4.7	209.00	0.80 - 1.20
STW-925	WATER	Sep, 2001	Cs-137	46.60 ± 0.8	45.13	0.80 - 1.24
STW-925	WATER	Sep, 2001	H-3	254.10 ± 3.6	207.00	0.74 - 2.29
STW-925	WATER	Sep, 2001	Ni-63	50.90 ± 3.0	45.25	0.70 - 1.30
STW-925	WATER	Sep, 2001	Pu-238	1.10 ± 0.1	1.09	0.74 - 1.22
STW-925	WATER	Sep, 2001	Pu-239/40	1.60 ± 0.1	1.63	0.75 - 1.26
STW-925	WATER	Sep, 2001	Sr-90	4.10 ± 0.3	3.73	0.64 - 1.50
STW-925	WATER	Sep, 2001	Uranium	2.20 ± 0.2	2.37	0.73 - 1.37
STW-926	WATER	Sep, 2001	Gr. Alpha	1,220.00 ± 32.0	1,150.00	0.58 - 1.26
STW-926	WATER	Sep, 2001	Gr. Beta	8,461.00 ± 206.0	7,970.00	0.56 - 1.50
STSO-927	SOIL	Sep, 2001	Ac-228	68.10 ± 1.4	59.57	0.80 - 1.50
STSO-927	SOIL	Sep, 2001	Am-241	5.20 ± 1.3	4.43	0.63 - 2.64
STSO-927	SOIL	Sep, 2001	Bi-212	65.10 ± 1.6	62.07	0.45 - 1.23
STSO-927	SOIL	Sep, 2001	Bi-214	47.30 ± 4.7	36.90	0.78 - 1.50
STSO-927	SOIL	Sep, 2001	Cs-137	659.20 ± 10.8	612.33	0.80 - 1.29
STSO-927	SOIL	Sep, 2001	K-40	737.70 ± 16.6	623.33	0.80 - 1.37

Table A-7. Environmental Measurements Laboratory Quality Assessment Program (EML)[a].

Lab Code	Sample Type	Date Collected	Analysis	Concentration [b] Laboratory result	EML Result[c]	Control Limits[d]
STSO-927	SOIL	Sep, 2001	Pb-212	64.70 ± 3.8	58.33	0.74 - 1.36
STSO-927	SOIL	Sep, 2001	Pb-214	53.70 ± 7.7	39.67	0.76 - 1.53
STSO-927	SOIL	Sep, 2001	Pu-239/40	9.30 ± 2.9	8.95	0.71 - 1.33
STSO-927	SOIL	Sep, 2001	Sr-90	27.40 ± 6.3	30.60	0.61 - 3.91
STSO-927	SOIL	Sep, 2001	Uranium	155.60 ± 7.8	194.23	0.62 - 1.35
STVE-928	VEGETATION	Sep, 2001	Am-241	7.00 ± 0.3	6.92	0.72 - 2.34
STVE-928	VEGETATION	Sep, 2001	Cm-244	4.30 ± 0.8	4.31	0.61 - 1.61
STVE-928	VEGETATION	Sep, 2001	Co-60	40.20 ± 0.9	35.30	0.75 - 1.51
STVE-928	VEGETATION	Sep, 2001	Cs-137	1,184.00 ± 2.8	1,030.00	0.80 - 1.37
STVE-928	VEGETATION	Sep, 2001	K-40	1,023.00 ± 44.1	898.67	0.78 - 1.43
STVE-928	VEGETATION	Sep, 2001	Pu-239/40	8.90 ± 1.4	11.02	0.67 - 1.49
STVE-928	VEGETATION	Sep, 2001	Sr-90	1,364.00 ± 18.4	1,612.80	0.52 - 1.23
STAP-929	AIR FILTER	Sep, 2001	Am-241	0.09 ± 30.0	0.09	0.69 - 2.40
STAP-929	AIR FILTER	Sep, 2001	Co-60	16.90 ± 0.3	17.50	0.79 - 1.30
STAP-929	AIR FILTER	Sep, 2001	Cs-134	11.80 ± 0.2	12.95	0.74 - 1.21
STAP-929	AIR FILTER	Sep, 2001	Cs-137	18.30 ± 0.3	17.10	0.78 - 1.35
STAP-929	AIR FILTER	Sep, 2001	Mn-54	85.40 ± 1.3	81.15	0.80 - 1.36
STAP-929	AIR FILTER	Sep, 2001	Pu-238	0.05 ± 0.0	0.07	0.66 - 1.35
STAP-929	AIR FILTER	Sep, 2001	Pu-239/40	0.22 ± 0.0	0.23	0.69 - 1.29
STAP-929	AIR FILTER	Sep, 2001	Sr-90	3.11 ± 0.1	3.48	0.55 - 2.05
STAP-929	AIR FILTER	Sep, 2001	Uranium	0.24 ± 0.1	0.22	0.80 - 2.54
STAP-930	AIR FILTER	Sep, 2001	Gr. Alpha	6.30 ± 0.1	5.36	0.57 - 1.47
STAP-930	AIR FILTER	Sep, 2001	Gr. Beta	13.80 ± 0.1	12.77	0.76 - 1.52

[a] The Environmental Measurements Laboratory provides the following nuclear species : Air Filters, Soil, Vegetation and Water.
[b] Results are reported in Bq/L with the following exceptions: Air Filter results are reported in Bq/Filter, Soil results are reported in Bq/Kg, Vegetation results are reported in Bq/Kg.
[c] The EML result listed is the mean of replicate determinations for each nuclide±the standard error of the mean.
[d] Control limits are reported by EML as the ratio of Reported Value / EML value.

APPENDIX B

REMP ANNUAL SUMMARY

TABLE B-1

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	529
				Gamma Isotopic	Quarterly Composite	40
Air Iodine	10	Weekly	519	Iodine131	Weekly	529
Direct Radiation (TLD)	54	Quarterly (continuous)	216	Gamma Exposure	Quarterly	216
Surface Water (Grab)	1	Monthly	12	Gamma Isotopic	Monthly	12
				Tritium	Quarterly Composite	4
				Gross Beta	Monthly	12
Surface Water (Effluent Composite)	1	Monthly	12	Gamma Isotopic	Monthly	12
				Gross Beta	Monthly	12
				Gross Alpha	Monthly	12
				Tritium	Quarterly Composite	4
				Iodine131	Monthly	12

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

TABLE B-1 (continued)

Sample Type	Number of Sampling Locations	Collection Frequency	Number of Samples Collected	Type of Analysis	Analysis Frequency	Number of Samples Analyzed*
Surface Water (Upstream Composite)	2	Monthly	22	Gamma Isotopic	Monthly	22
				Gross Beta	Monthly	22
				Gross Alpha	Monthly	22
				Tritium	Quarterly Composite	8
Well Water	2[a]	Quarterly	12	Iodine^{131}	Quarterly	12
				Gross Alpha	Quarterly	12
				Gross Beta	Quarterly	12
				Gamma Isotopic	Quarterly	12
				Tritium	Quarterly	12
Drinking Water	1	Monthly	12	Gross Alpha	Monthly	12
				Gross Beta	Monthly	12
				Gamma Isotopic	Monthly	12
				Tritium	Quarterly Composite	4

* 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.

TABLE B-1 (continued)

Sample Type	Number of Sampling Locations	Collection Frequency	Number of Samples Collected	Type of Analysis	Analysis Frequency	Number of Samples Analyzed*
Shoreline Sediment	2	Semi-Annually	4	Gross Alpha	Semi-Annually	4
				Gross Beta	Semi-Annually	4
				Gamma Isotopic	Semi-Annually	4
				Sr^{90}	Semi-Annually	4
Grass	4	Monthly / Semi-Monthly[b]	56	Gamma Isotopic (including I^{131})	Monthly / Semi-Monthly	56
Vegetables	4	Monthly (during growing season)	48	Gross Beta	Monthly	48
				Gamma Isotopic (including I^{131})	Monthly	48
Fish	2	Semi-Annually	16	Gamma Isotopic	Semi-Annually	16
Milk	1	Monthly / Semi-Monthly[b]	19	Gamma Isotopic	Monthly / Semi-Monthly	19
				$Iodine^{131}$	Monthly / Semi-Monthly	19
				Sr^{90}	Monthly / Semi-Monthly	19

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

b Samples are collected Monthly from November through April (as delineated within the Station ODCM) and Semi-Monthly May through October.

TABLE B-2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

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

Location of Facility: **DeWitt, Illinois** Reporting Period: **01 January – 31 December 2001**
(county, state)

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 – Direction --- Mean (f) - (Range)	Control Locations: Mean (f) --- (Range)	Number of Non-routine Reported Measurements
Direct Radiation --- (mRem/qtr)	Gamma dose --- 216	-	18.1 (200/200) --- (13.1 – 21.9)	CL-81 4.5 miles WNW --- 19.9 (4/4)[a] (17.6 – 21.0)	16.9 (16/16) --- (15.0 – 19.5)	0

a Highest quarterly mean

Medium or Pathway Sampled (Unit of Measurement)	Type of Analysis / Total Number Performed	LLD	All Indicator Locations: Mean (f) (Range)	Location with Highest Annual Mean	Control Locations: Mean (f) (Range)	Number of Non-routine Reported Measurements
Air Particulates --- (pCi/m^3)	Gross Beta --- 519	-	0.025 (467/467)[b] (.006 - .060) ---	CL-8 2.2 miles E --- .027 (52/52) (.008 - .060)	0.026 (52/52) (0.010 – 0.055) ---	0
	Gamma Spec --- 40					
	Cs^{134}	0.0012	LLD	-	LLD	0
	Cs^{137}	0.0013	LLD	-	LLD	0

b Values excluded due to insufficient volume collected. Refer to Appendix D for exceptions.

Medium or Pathway Sampled (Unit of Measurement)	Type of Analysis / Total Number Performed	LLD	All Indicator Locations	Location with Highest Annual Mean	Control Locations	Number of Non-routine Reported Measurements
Air Iodine --- (pCi/m^3)	I^{131} --- 519	0.07	LLD	-	LLD	0

Note: Column explanations are at the end of Table B-2.

TABLE B-2 (continued)

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 – Direction --- Mean (f) - (Range)	Control Locations: Mean (f) - --- (Range)	Number of Non-routine Reported Measurements
Surface Water Grab (pCi/l)	Gross Beta 12	-	2.9 (12/12) (2.3 – 3.7)	CL-13 3.6 miles SW --- 2.9 (12/12) (2.3 – 3.7)	NA	0
	Tritium 4	184	LLD	-	NA	0
	Gamma Spec 12			-		
	Mn^{54}	6.3	LLD	-	NA	0
	Fe^{59}	12.7	LLD	-	NA	0
	Co^{58}	6.9	LLD	-	NA	0
	Co^{60}	6.7	LLD	-	NA	0
	Zn^{65}	12.3	LLD	-	NA	0
	Nb^{95}	9.1	LLD	-	NA	0
	Zr^{95}	15.5	LLD	-	NA	0
	Cs^{134}	7.0	LLD	-	NA	0
	Cs^{137}	6.4	LLD	-	NA	0
	Ba^{140}	55.6	LLD	-	NA	0
	La^{140}	14.8	LLD		NA	0

Note: Column explanations are at the end of Table B-2.

TABLE B-2 (continued)

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 – Direction --- Mean (f) - (Range)	Control Locations: Mean (f) - --- (Range)	Number of Non-routine Reported Measurements
Surface Water Composite (pCi/l)	Gross Beta 34	4	3.0 (34/34) (1.1 – 7.8)	CL-99 3.5 Miles NNE --- 3.4 (11/11) (1.1 – 7.8)	NA	0
	Tritium 4	184	LLD	-	NA	0
	I^{131} 12	0.5	LLD	-	NA	0
	Gamma Spec 34					
	Mn^{54}	5.9	LLD	-	NA	0
	Fe^{59}	13.4	LLD	-	NA	0
	Co^{58}	5.6	LLD	-	NA	0
	Co^{60}	7.0	LLD	-	NA	0
	Zn^{65}	14.3	LLD	-	NA	0
	Nb^{95}	7.2	LLD	-	NA	0
	Zr^{95}	13.9	LLD	-	NA	0
	Cs^{134}	6.5	LLD	-	NA	0
	Cs^{137}	7.0	LLD	-	NA	0
	Ba^{140}	59.7	LLD	-	NA	0
	La^{140}	13.8	LLD	-	NA	0

Note: Column explanations are at the end of Table B-2.

TABLE B-2 (continued)

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 – Direction --- Mean (f) - (Range)	Control Locations: Mean (f) - --- (Range)	Number of Non-routine Reported Measurements
Drinking Water (pCi/l)	Gross Beta 12	4	1.4 (12/12) (0.9 – 2.1)	CL-14 0 Miles --- 1.4 (12/12) (0.9 – 2.1)	NA	0
	Tritium 4	184	LLD	-	NA	0
	Gamma Spec 12					
	Mn^{54}	5.3	LLD	-	NA	0
	Fe^{59}	11.5	LLD	-	NA	0
	Co^{58}	5.4	LLD	-	NA	0
	Co^{60}	6.6	LLD	-	NA	0
	Zn^{65}	10.4	LLD	-	NA	0
	Nb^{95}	6.0	LLD	-	NA	0
	Zr^{95}	12.6	LLD	-	NA	0
	Cs^{134}	6.2	LLD	-	NA	0
	Cs^{137}	5.9	LLD	-	NA	0
	Ba^{140}	59.7	LLD	-	NA	0
	La^{140}	13.0	LLD	-	NA	0

Note: Column explanations are at the end of Table B-2.

TABLE B-2 (continued)

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 – Direction --- Mean (f) - (Range)	Control Locations: Mean (f) - --- (Range)	Number of Non-routine Reported Measurements
Well Water (pCi/l)	Gross Beta 12	2.2	2.3 (4/12) (1.9 – 2.4)	CL-12T* 1.6 Miles E --- 2.4 (2/4) (2.4 – 2.4)	NA	0
	I^{131} 12	0.4	LLD	-	NA	0
	Tritium 4	182	LLD	-	NA	0
	Gamma Spec 12					
	Mn^{54}	6.0	LLD	-	NA	0
	Fe^{59}	13.4	LLD	-	NA	0
	Co^{58}	5.2	LLD	-	NA	0
	Co^{60}	5.4	LLD	-	NA	0
	Zn^{65}	8.0	LLD	-	NA	0
	Nb^{95}	9.7	LLD	-	NA	0
	Zr^{95}	9.9	LLD	-	NA	0
	Cs^{134}	5.0	LLD	-	NA	0
	Cs^{137}	6.2	LLD	-	NA	0
	Ba^{140}	57.7	LLD	-	NA	0
	La^{140}	12.4	LLD	-	NA	0

*(T) treated well water sample

Note: Column explanations are at the end of Table B-2.

TABLE B-2 (continued)

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 – Direction / Mean (f) - (Range)	Control Locations: Mean (f) - (Range)	Number of Non-routine Reported Measurements
Milk (pCi/l)	I^{131} 19	0.5	LLD	-	NA	0
	Gamma Spec 19					
	Cs^{134}	8.6	LLD	-	NA	0
	Cs^{137}	8.7	LLD	-	NA	0
	Ba^{140}	32.7	LLD	-	NA	0
	La^{140}	9.44	LLD	-	NA	0
Fish (pCi/g wet)	Gamma Spec 16					
	Mn^{54}	0.051	LLD	-	NA	0
	Fe^{59}	0.123	LLD	-	NA	0
	Co^{58}	0.062	LLD	-	NA	0
	Co^{60}	0.029	LLD	-	NA	0
	Zn^{65}	0.075	LLD	-	NA	0
	Cs^{134}	0.051	LLD	-	NA	0
	Cs^{137}	0.029	LLD	-	NA	0
Shoreline Sediments (pCi/g dry)	Gamma Spec 4					
	Cs^{134}	0.032	LLD	-	NA	0
	Cs^{137}	0.018	LLD	-	NA	0

Note: Column explanations at the end of Table B-2.

TABLE B-2 (continued)

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 – Direction Mean (f) - (Range)	Control Locations: Mean (f) - (Range)	Number of Non-routine Reported Measurements
Vegetables (pCi/g wet)	Gamma Spec 48					
	I^{131}	0.050	LLD	-	NA	0
	Cs^{134}	0.041	LLD	-	NA	0
	Cs^{137}	0.035	LLD	-	NA	0
Grass (pCi/g dry)	Gamma Spec 56					
	I^{131}	0.050	LLD	-	NA	0
	Cs^{134}	0.036	LLD	-	NA	0
	Cs^{137}	0.030	LLD	-	NA	0

Note: Column explanations at the end of Table B-2.

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 – Direction ------------- Mean (f) - (Range)	Control Locations: Mean (f) - ----------- (Range)	Number of Non-routine Reported Measurements
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7

TABLE 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 = pico-curie per cubic meter of sampled air; mRem/quarter = exposure measured for calendar quarter period; pCi/l = pico-curie per liter of sample; pCi/g = pico-curie 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) in sample by liquid scintillation counting method; TLD = direct measurement of gamma exposure using thermoluminescent dosimeters. Total number of analyses does not include duplicate analyses, recounts, or reanalysis. Only ODCM required LLDs and detectable activity (excluding some naturally occurring activity such as Bi^{212}) results are reported in this table. All sample results can be found in Appendix E of this report.

Column 3: The ODCM required LLD is given when applicable. LLD reported is the highest of those reported for each of the analyses during the year; if all analyses reported positive values, no LLD is reported. It should be noted that - in most cases - the CPS REMP uses lower detection limits than required.

TABLE B-2 (continued)

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 – Direction --------------- Mean (f) - (Range)	Control Locations: Mean (f) - ------------- (Range)	Number of Non-routine Reported Measurements
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7

TABLE EXPLANATIONS (continued):

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 a 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: Seven (7) results greater than LLD out of fifteen (15) samples taken would be reported as 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 name corresponding to 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, Revision. 1, November 1979) include a table of radioisotope concentrations that, if exceeded by confirmed sample measurements, indicate that a Non-routine Reported Measurement exists. Such measurements require further investigation to validate the source.

APPENDIX C

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 releases).

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 the Clinton Power Station so as not to be influenced by station operations.

Cosmic radiation - penetrating ionizing radiation originating from the sun and from outer space varying from altitude and latitude.

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 radio waves 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 dose 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 actually present.

Microcurie (µCi) - 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, and neutron) or waves (gamma).

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

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 **R**oentgen **E**quivalent **M**an.

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

Site boundary - the site boundary is the line beyond which the land is neither owned, nor leased, nor otherwise controlled by the licensee.

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).

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

APPENDIX D

Exceptions to the REMP During 2001

Data from the radiological analysis of environmental samples are routinely reviewed and evaluated by the Chemistry Department at the Clinton Power Station (CPS). 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 (ODCM) reporting levels. Reporting levels for radioactivity concentrations from environmental samples are required by the CPS-ODCM and are listed in Table 3-A of this report.

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

- Examine the collection data sheets for any indication of collection or delivery errors, tampering, vandalism, equipment calibration or any malfunction[s] as a result of electrical power failure[s], weather conditions, blown fuses, 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 Radiological Effluent Release Reports
- If possible, recount and / or reanalyze the sample
- Collect additional follow-up samples as warranted

During 2001, no investigations were performed as a result of reaching any ODCM reporting levels. All sample analysis required by the ODCM achieved the LLDs specified by the CPS ODCM (refer to Table 3-B of this report). Sampling and analysis exceptions are listed in this appendix.

SAMPLING AND ANALYSIS EXCEPTIONS FOR 2001

The exceptions described in this section are those that are considered deviations from the Radiological Environmental Monitoring Program as required by the ODCM. This section addresses the reporting requirements of Section 7.1 of the ODCM.

[1] 28 March 2001

- Although Surface Water Sample[s] CL-91 and CL-99 were properly collected, packaged and shipped to our Laboratory for analysis, both of these Water Samples were damaged during transit. Upon arrival at the Laboratory Facility, said samples arrived damaged [leaking] such that an adequate volume for analysis was not possible. CPS captured this event as part of their Corrective Actions Program under Condition Report Number 2-01-04-046.

[2] 28 November 2001

- Upon the weekly Air Sample / Filter Cartridge change-out at Air Sample Station CL-15, there was no electrical power. Additional testing at the station revealed that all electrical power was de-energized. After further troubleshooting, it was subsequently determined that a fuse had blown and was replaced. Because the minimum air volume was not obtained from this Air Sampling Station as a result of the blown fuse, this sample was not included in the 2001 Annual Report. CPS captured this event as part of their Corrective Actions Program under Condition Report Number 84348.

APPENDIX E

CPS Radiological Environmental Monitoring Results

During 2001

TABLE 1

GROSS BETA ACTIVITY IN AIR PARTICULATES FOR 2001
(pCi/m^3)

DATE COLLECTED	CL-1	CL-2	CL-3	CL-4	CL-6
10-Jan-01	0.035 ± 0.004	0.035 ± 0.004	0.036 ± 0.004	0.032 ± 0.004	0.033 ± 0.004
17-Jan-01	0.030 ± 0.004	0.029 ± 0.004	0.039 ± 0.004	0.027 ± 0.004	0.030 ± 0.004
24-Jan-01	0.041 ± 0.004	0.039 ± 0.004	0.043 ± 0.005	0.039 ± 0.005	0.039 ± 0.004
31-Jan-01	0.026 ± 0.004	0.023 ± 0.003	0.028 ± 0.004	0.026 ± 0.004	0.029 ± 0.004
07-Feb-01	0.032 ± 0.004	0.031 ± 0.004	0.029 ± 0.004	0.034 ± 0.004	0.032 ± 0.004
14-Feb-01	0.024 ± 0.003	0.022 ± 0.002	0.022 ± 0.003	0.025 ± 0.003	0.027 ± 0.004
21-Feb-01	0.033 ± 0.004	0.032 ± 0.003	0.033 ± 0.004	0.033 ± 0.004	0.040 ± 0.004
28-Feb-01	0.024 ± 0.004	0.026 ± 0.004	0.025 ± 0.004	0.029 ± 0.004	0.029 ± 0.004
07-Mar-01	0.028 ± 0.004	0.026 ± 0.004	0.026 ± 0.004	0.027 ± 0.004	0.027 ± 0.004
14-Mar-01	0.020 ± 0.003	0.021 ± 0.003	0.021 ± 0.003	0.021 ± 0.003	0.022 ± 0.003
22-Mar-01	0.017 ± 0.003	0.018 ± 0.003	0.017 ± 0.003	0.017 ± 0.003	0.015 ± 0.003
28-Mar-01	0.020 ± 0.004	0.025 ± 0.004	0.019 ± 0.004	0.021 ± 0.004	0.025 ± 0.004
04-Apr-01	0.023 ± 0.003	0.026 ± 0.003	0.023 ± 0.003	0.025 ± 0.003	0.025 ± 0.003
11-Apr-01	0.025 ± 0.004	0.021 ± 0.003	0.018 ± 0.003	0.019 ± 0.003	0.024 ± 0.003
18-Apr-01	0.019 ± 0.003	0.018 ± 0.003	0.017 ± 0.003	0.019 ± 0.004	0.018 ± 0.003
25-Apr-01	0.026 ± 0.003	0.027 ± 0.003	0.026 ± 0.003	0.022 ± 0.003	0.025 ± 0.003
02-May-01	0.026 ± 0.004	0.030 ± 0.004	0.027 ± 0.004	0.019 ± 0.004	0.027 ± 0.004
09-May-01	0.022 ± 0.003	0.024 ± 0.003	0.026 ± 0.004	0.021 ± 0.003	0.027 ± 0.004
16-May-01	0.021 ± 0.004	0.027 ± 0.004	0.024 ± 0.004	0.026 ± 0.004	0.026 ± 0.003
23-May-01	0.021 ± 0.003	0.019 ± 0.003	0.022 ± 0.004	0.025 ± 0.004	0.018 ± 0.003
30-May-01	0.009 ± 0.003	0.011 ± 0.003	0.010 ± 0.003	0.010 ± 0.003	0.007 ± 0.003
06-Jun-01	0.011 ± 0.003	0.011 ± 0.003	0.011 ± 0.003	0.013 ± 0.003	0.011 ± 0.003
13-Jun-01	0.026 ± 0.004	0.026 ± 0.004	0.026 ± 0.004	0.024 ± 0.004	0.025 ± 0.004
20-Jun-01	0.024 ± 0.003	0.025 ± 0.003	0.025 ± 0.004	0.025 ± 0.004	0.026 ± 0.004
27-Jun-01	0.022 ± 0.003	0.025 ± 0.003	0.022 ± 0.003	0.019 ± 0.003	0.020 ± 0.003
03-Jul-01	0.022 ± 0.004	0.026 ± 0.004	0.022 ± 0.004	0.019 ± 0.004	0.022 ± 0.004
11-Jul-01	0.023 ± 0.004	0.021 ± 0.003	0.018 ± 0.003	0.018 ± 0.003	0.023 ± 0.004
18-Jul-01	0.023 ± 0.004	0.025 ± 0.004	0.022 ± 0.004	0.017 ± 0.003	0.021 ± 0.004
25-Jul-01	0.026 ± 0.004	0.032 ± 0.004	0.029 ± 0.004	0.023 ± 0.003	0.026 ± 0.003
01-Aug-01	0.027 ± 0.004	0.027 ± 0.004	0.026 ± 0.004	0.026 ± 0.004	0.026 ± 0.004
08-Aug-01	0.031 ± 0.004	0.033 ± 0.004	0.031 ± 0.004	0.033 ± 0.004	0.030 ± 0.004
15-Aug-01	0.025 ± 0.004	0.022 ± 0.004	0.020 ± 0.004	0.021 ± 0.004	0.022 ± 0.004
22-Aug-01	0.022 ± 0.004	0.026 ± 0.004	0.028 ± 0.004	0.023 ± 0.004	0.023 ± 0.003
29-Aug-01	0.023 ± 0.004	0.026 + 0.004	0.026 ± 0.004	0.025 ± 0.004	0.025 ± 0.004
04-Sep-01	0.023 ± 0.004	0.020 ± 0.004	0.026 ± 0.005	0.033 ± 0.005	0.029 ± 0.005
12-Sep-01	0.021 ± 0.003	0.020 + 0.003	0.022 ± 0.003	0.020 ± 0.003	0.021 ± 0.003
19-Sep-01	0.031 ± 0.004	0.028 + 0.004	0.027 ± 0.004	0.027 ± 0.004	0.029 ± 0.004
26-Sep-01	0.027 ± 0.003	0.030 ± 0.003	0.028 ± 0.004	0.027 ± 0.003	0.028 ± 0.003
03-Oct-01	0.026 ± 0.004	0.028 ± 0.004	0.025 ± 0.004	0.025 ± 0.004	0.024 ± 0.004
11-Oct-01	0.028 ± 0.003	0.030 ± 0.003	0.027 ± 0.003	0.033 ± 0.003	0.030 ± 0.003
17-Oct-01	0.011 ± 0.004	0.012 ± 0.004	0.013 ± 0.004	0.013 ± 0.004	0.015 ± 0.004
24-Oct-01	0.025 ± 0.004	0.027 ± 0.004	0.026 ± 0.004	0.027 ± 0.004	0.030 ± 0.004
31-Oct-01	0.020 ± 0.004	0.020 + 0.003	0.020 ± 0.004	0.017 ± 0.003	0.018 ± 0.004
07-Nov-01	0.018 ± 0.004	0.019 ± 0.004	0.021 ± 0.004	0.015 ± 0.003	0.018 ± 0.004
14-Nov-01	0.030 ± 0.004	0.033 ± 0.004	0.034 ± 0.004	0.030 ± 0.004	0.031 ± 0.004
20-Nov-01	0.053 ± 0.005	0.055 + 0.005	0.056 ± 0.005	0.056 ± 0.005	0.055 ± 0.005
28-Nov-01	0.023 ± 0.003	0.022 + 0.003	0.021 ± 0.003	0.023 ± 0.003	0.023 ± 0.003
05-Dec-01	0.021 ± 0.003	0.022 ± 0.003	0.028 ± 0.004	0.025 ± 0.004	0.028 ± 0.004
12-Dec-01	0.033 ± 0.004	0.033 ± 0.004	0.031 ± 0.004	0.040 ± 0.004	0.037 ± 0.004
19-Dec-01	0.029 ± 0.004	0.028 ± 0.004	0.028 ± 0.004	0.029 ± 0.004	0.030 ± 0.004
26-Dec-01	0.030 ± 0.004	0.031 ± 0.004	0.033 ± 0.004	0.033 ± 0.004	0.033 ± 0.004
02-Jan-02	0.027 ± 0.004	0.031 ± 0.004	0.025 ± 0.004	0.024 ± 0.004	0.024 ± 0.004

TABLE 1 (continued)

DATE COLLECTED	CL-7	CL-8	CL-11[a]	CL-15	CL-94
10-Jan-01	0.032 ± 0.004	0.035 ± 0.004	0.036 ± 0.004	0.036 ± 0.004	0.032 ± 0.004
17-Jan-01	0.029 ± 0.004	0.030 ± 0.004	0.026 ± 0.004	0.031 ± 0.004	0.025 ± 0.003
24-Jan-01	0.035 ± 0.004	0.037 ± 0.004	0.041 ± 0.005	0.045 ± 0.005	0.044 ± 0.005
31-Jan-01	0.026 ± 0.003	0.026 ± 0.004	0.029 ± 0.004	0.026 ± 0.003	0.030 ± 0.004
07-Feb-01	0.029 ± 0.003	0.034 ± 0.004	0.029 ± 0.003	0.029 ± 0.003	0.031 ± 0.004
14-Feb-01	0.023 ± 0.003	0.027 ± 0.004	0.023 ± 0.003	0.027 ± 0.004	0.027 ± 0.004
21-Feb-01	0.030 ± 0.004	0.031 ± 0.004	0.031 ± 0.004	0.035 ± 0.004	0.033 ± 0.004
28-Feb-01	0.024 ± 0.004	0.028 ± 0.004	0.026 ± 0.004	0.026 ± 0.004	0.024 ± 0.004
07-Mar-01	0.025 ± 0.004	0.029 ± 0.004	0.027 ± 0.004	0.024 ± 0.004	0.026 ± 0.004
14-Mar-01	0.020 ± 0.003	0.021 ± 0.003	0.022 ± 0.003	0.018 ± 0.003	0.022 ± 0.003
22-Mar-01	0.015 ± 0.003	0.020 ± 0.003	0.016 ± 0.003	0.012 ± 0.003	0.019 ± 0.003
28-Mar-01	0.018 ± 0.003	0.021 ± 0.004	0.021 ± 0.004	0.020 ± 0.004	0.021 ± 0.004
04-Apr-01	0.022 ± 0.003	0.024 ± 0.003	0.024 ± 0.003	0.019 ± 0.003	0.025 ± 0.003
11-Apr-01	0.021 ± 0.003	0.021 ± 0.003	0.018 ± 0.003	0.019 ± 0.004	0.020 ± 0.003
18-Apr-01	0.015 ± 0.003	0.022 ± 0.004	0.021 ± 0.004	0.016 ± 0.003	0.019 ± 0.003
25-Apr-01	0.020 ± 0.003	0.026 ± 0.003	0.027 ± 0.003	0.020 ± 0.003	0.025 ± 0.003
02-May-01	0.024 ± 0.004	0.028 ± 0.004	0.027 ± 0.004	0.020 ± 0.004	0.026 ± 0.004
09-May-01	0.019 ± 0.003	0.026 ± 0.004	0.024 ± 0.003	0.017 ± 0.003	0.024 ± 0.003
16-May-01	0.021 ± 0.004	0.024 ± 0.004	0.022 ± 0.004	0.020 ± 0.004	0.024 ± 0.004
23-May-01	0.018 ± 0.003	0.021 ± 0.004	0.021 ± 0.003	0.021 ± 0.003	0.020 ± 0.003
30-May-01	0.008 ± 0.003	0.010 ± 0.003	0.010 ± 0.003	0.006 ± 0.003	0.011 ± 0.003
06-Jun-01	0.009 ± 0.003	0.009 ± 0.003	0.013 ± 0.003	0.009 ± 0.003	0.013 ± 0.003
13-Jun-01	0.025 ± 0.004	0.025 ± 0.004	0.021 ± 0.004	0.024 ± 0.004	0.026 ± 0.004
20-Jun-01	0.023 ± 0.003	0.027 ± 0.003	0.023 ± 0.003	0.025 ± 0.004	0.028 ± 0.004
27-Jun-01	0.017 ± 0.003	0.027 ± 0.004	0.023 ± 0.003	0.019 ± 0.003	0.023 ± 0.003
03-Jul-01	0.021 ± 0.004	0.026 ± 0.004	0.025 ± 0.004	0.022 ± 0.004	0.024 ± 0.004
11-Jul-01	0.022 ± 0.003	0.022 ± 0.003	0.023 ± 0.004	0.021 ± 0.004	0.021 ± 0.003
18-Jul-01	0.020 ± 0.004	0.027 ± 0.004	0.026 ± 0.004	0.021 ± 0.004	0.024 ± 0.004
25-Jul-01	0.027 ± 0.004	0.034 ± 0.004	0.027 ± 0.004	0.027 ± 0.004	0.030 ± 0.004
01-Aug-01	0.026 ± 0.004	0.031 ± 0.004	0.028 ± 0.004	0.026 ± 0.004	0.030 ± 0.004
08-Aug-01	0.029 ± 0.004	0.036 ± 0.004	0.031 ± 0.004	0.034 ± 0.004	0.033 ± 0.004
15-Aug-01	0.021 ± 0.004	0.023 ± 0.004	0.024 ± 0.004	0.018 ± 0.004	0.026 ± 0.004
22-Aug-01	0.021 ± 0.003	0.029 ± 0.004	0.028 ± 0.004	0.024 ± 0.004	0.026 ± 0.004
29-Aug-01	0.020 ± 0.004	0.020 ± 0.004	0.024 ± 0.004	0.022 ± 0.004	0.026 ± 0.004
04-Sep-01	0.020 ± 0.004	0.025 ± 0.004	0.028 ± 0.005	0.028 ± 0.005	0.030 ± 0.005
12-Sep-01	0.018 ± 0.003	0.022 ± 0.003	0.021 ± 0.003	0.025 ± 0.003	0.022 ± 0.003
19-Sep-01	0.027 ± 0.004	0.032 ± 0.004	0.029 ± 0.004	0.032 ± 0.004	0.028 ± 0.004
26-Sep-01	0.029 ± 0.003	0.027 ± 0.003	0.026 ± 0.003	0.027 ± 0.004	0.027 ± 0.003
03-Oct-01	0.026 ± 0.004	0.023 ± 0.004	0.024 ± 0.004	0.023 ± 0.004	0.023 ± 0.004
11-Oct-01	0.027 ± 0.003	0.031 ± 0.003	0.019 ± 0.003	0.026 ± 0.003	0.031 ± 0.003
17-Oct-01	0.014 ± 0.004	0.013 ± 0.004	0.016 ± 0.004	0.011 ± 0.003	0.010 ± 0.004
24-Oct-01	0.025 ± 0.004	0.030 ± 0.004	0.029 ± 0.004	0.016 ± 0.004	0.027 ± 0.004
31-Oct-01	0.019 ± 0.003	0.021 ± 0.004	0.019 ± 0.004	0.019 ± 0.004	0.018 ± 0.003
07-Nov-01	0.017 ± 0.004	0.019 ± 0.004	0.017 ± 0.004	0.020 ± 0.004	0.019 ± 0.004
14-Nov-01	0.031 ± 0.004	0.034 ± 0.004	0.041 ± 0.005	0.035 ± 0.004	0.031 ± 0.004
20-Nov-01	0.060 ± 0.005	0.057 ± 0.005	0.055 ± 0.005	0.056 ± 0.005	0.052 ± 0.005
28-Nov-01	0.019 ± 0.003	0.022 ± 0.003	0.020 ± 0.003	0.039 ± 0.008[b]	0.026 ± 0.003
05-Dec-01	0.028 ± 0.004	0.026 ± 0.004	0.024 ± 0.003	0.024 ± 0.004	0.025 ± 0.003
12-Dec-01	0.038 ± 0.004	0.037 ± 0.004	0.037 ± 0.004	0.034 ± 0.004	0.037 ± 0.004
19-Dec-01	0.026 ± 0.004	0.030 ± 0.004	0.030 ± 0.004	0.024 ± 0.003	0.031 ± 0.004
26-Dec-01	0.030 ± 0.004	0.036 ± 0.004	0.027 ± 0.004	0.029 ± 0.004	0.033 ± 0.004
02-Jan-02	0.030 ± 0.004	0.025 ± 0.004	0.024 ± 0.004	0.023 ± 0.004	0.022 ± 0.004

a Control Location, all other locations are Indicator Locations.
b Volume low due to blown fuse. Result not included.

TABLE 2

GAMMA ISOTOPIC ACTIVITY IN AIR PARTICULATES FOR 2001[c]

(pCi/m^3)

SITE	ISOTOPE	1^{ST} QTR	2^{ND} QTR	3^{RD} QTR	4^{TH} QTR
CL-1	Be^7	0.059 ± 0.017	0.074 ± 0.017	0.094 ± 0.018	0.064 ± 0.017
	K^{40}	< 0.033	< 0.023	< 0.027	< 0.024
	Co^{60}	< 0.0007	< 0.0008	< 0.0008	< 0.0005
	Nb^{95}	< 0.0006	< 0.0013	< 0.0008	< 0.0010
	Zr^{95}	< 0.0008	< 0.0010	< 0.0008	< 0.0009
	Ru^{103}	< 0.0011	< 0.0008	< 0.0012	< 0.0013
	Ru^{106}	< 0.0080	< 0.0063	< 0.0039	< 0.0072
	Cs^{134}	< 0.0006	< 0.0006	< 0.0009	< 0.0010
	Cs^{137}	< 0.0007	< 0.0005	< 0.0003	< 0.0009
	Ce^{141}	< 0.0021	< 0.0022	< 0.0009	< 0.0016
	Ce^{144}	< 0.0055	< 0.0061	< 0.0044	< 0.0049
CL-2	Be^7	0.069 ± 0.022	0.067 ± 0.014	0.067 ± 0.017	0.055 ± 0.014
	K^{40}	< 0.028	< 0.023	< 0.027	< 0.034
	Co^{60}	< 0.0007	< 0.0008	< 0.0008	< 0.0010
	Nb^{95}	< 0.0014	< 0.0014	< 0.0010	< 0.0008
	Zr^{95}	< 0.0008	< 0.0011	< 0.0021	< 0.0017
	Ru^{103}	< 0.0007	< 0.0007	< 0.0014	< 0.0013
	Ru^{106}	< 0.0091	< 0.0045	< 0.0041	< 0.0066
	Cs^{134}	< 0.0004	< 0.0004	< 0.0012	< 0.0005
	Cs^{137}	< 0.0005	< 0.0005	< 0.0007	< 0.0007
	Ce^{141}	< 0.0022	< 0.0015	< 0.0022	< 0.0007
	Ce^{144}	< 0.0059	< 0.0054	< 0.0058	< 0.0024
CL-3	Be^7	0.063 ± 0.021	0.069 ± 0.015	0.083 ± 0.019	0.057± 0.014
	K^{40}	< 0.029	< 0.024	< 0.028	< 0.019
	Co^{60}	< 0.0009	< 0.0008	< 0.0008	< 0.0011
	Nb^{95}	< 0.0013	< 0.0016	< 0.0010	< 0.0008
	Zr^{95}	< 0.0014	< 0.0015	< 0.0009	< 0.0012
	Ru^{103}	< 0.0004	< 0.0008	< 0.0013	< 0.0010
	Ru^{106}	< 0.0081	< 0.0050	< 0.0081	< 0.0068
	Cs^{134}	< 0.0006	< 0.0004	< 0.0011	< 0.0008
	Cs^{137}	< 0.0008	< 0.0003	< 0.0006	< 0.0008
	Ce^{141}	< 0.0023	< 0.0024	< 0.0021	< 0.0019
	Ce^{144}	< 0.0044	< 0.0043	< 0.0023	< 0.0022

c All I^{131} results were < 0.07 pCi/m^3

TABLE 2 (continued)[c]

SITE	ISOTOPE	1ST QTR	2ND QTR	3RD QTR	4TH QTR
CL-4	Be^7	0.069 ± 0.021	0.084 ± 0.016	0.087 ± 0.018	0.066± 0.016
	K^{40}	< 0.030	< 0.024	< 0.028	< 0.023
	Co^{60}	< 0.0009	< 0.0009	< 0.0008	< 0.0011
	Nb^{95}	< 0.0006	< 0.0014	< 0.0008	< 0.0016
	Zr^{95}	< 0.0019	< 0.0011	< 0.0014	< 0.0015
	Ru^{103}	< 0.0006	< 0.0009	< 0.0006	< 0.0011
	Ru^{106}	< 0.0068	< 0.0071	< 0.0068	< 0.0100
	Cs^{134}	< 0.0004	< 0.0004	< 0.0009	< 0.0007
	Cs^{137}	< 0.0006	< 0.0005	< 0.0004	< 0.0013
	Ce^{141}	< 0.0019	< 0.0018	< 0.0019	< 0.0029
	Ce^{144}	< 0.0064	< 0.0030	< 0.0050	< 0.0048
CL-6	Be^7	0.079 ± 0.016	0.075 ± 0.015	0.075 ± 0.020	0.047± 0.019
	K^{40}	< 0.028	< 0.023	< 0.027	< 0.031
	Co^{60}	< 0.0007	< 0.0008	< 0.0009	< 0.0013
	Nb^{95}	< 0.0006	< 0.0014	< 0.0011	< 0.0008
	Zr^{95}	< 0.0008	< 0.0016	< 0.0008	< 0.0019
	Ru^{103}	< 0.0006	< 0.0007	< 0.0008	< 0.0012
	Ru^{106}	< 0.0061	< 0.0055	< 0.0039	< 0.0045
	Cs^{134}	< 0.0006	< 0.0004	< 0.0010	< 0.0005
	Cs^{137}	< 0.0007	< 0.0004	< 0.0006	< 0.0008
	Ce^{141}	< 0.0013	< 0.0024	< 0.0019	< 0.0012
	Ce^{144}	< 0.0047	< 0.0052	< 0.0054	< 0.0054
CL-7	Be^7	0.070 ± 0.014	0.076 ± 0.018	0.084 ± 0.018	0.046± 0.016
	K^{40}	< 0.028	< 0.023	< 0.027	< 0.024
	Co^{60}	< 0.0007	< 0.0008	< 0.0008	< 0.0012
	Nb^{95}	< 0.0008	< 0.0012	< 0.0010	< 0.0012
	Zr^{95}	< 0.0015	< 0.0014	< 0.0013	< 0.0021
	Ru^{103}	< 0.0013	< 0.0010	< 0.0008	< 0.0017
	Ru^{106}	< 0.0073	< 0.0068	< 0.0054	< 0.0111
	Cs^{134}	< 0.0006	< 0.0004	< 0.0009	< 0.0012
	Cs^{137}	< 0.0013	< 0.0003	< 0.0007	< 0.0006
	Ce^{141}	< 0.0025	< 0.0025	< 0.0014	< 0.0023
	Ce^{144}	< 0.0060	< 0.0045	< 0.0052	< 0.0049
CL-8	Be^7	0.063 ± 0.021	0.080 ± 0.018	0.076 ± 0.013	0.050± 0.014
	K^{40}	< 0.031	< 0.024	< 0.027	< 0.022
	Co^{60}	< 0.0007	< 0.0008	< 0.0008	< 0.0008
	Nb^{95}	< 0.0010	< 0.0014	< 0.0007	< 0.0006
	Zr^{95}	< 0.0009	< 0.0011	< 0.0009	< 0.0010
	Ru^{103}	< 0.0018	< 0.0015	< 0.0007	< 0.0010
	Ru^{106}	< 0.0068	< 0.0051	< 0.0044	< 0.0082
	Cs^{134}	< 0.0005	< 0.0006	< 0.0008	< 0.0005
	Cs^{137}	< 0.0005	< 0.0010	< 0.0007	< 0.0005
	Ce^{141}	< 0.0013	< 0.0020	< 0.0008	< 0.0015
	Ce^{144}	< 0.0059	< 0.0047	< 0.0024	< 0.0038

c All I^{131} results were < 0.07 pCi/m^3

TABLE 2 (continued)

SITE	ISOTOPE	1ST QTR	2ND QTR	3RD QTR	4TH QTR
CL-11[d]	Be^7	0.075 0.016	0.079 0.019	0.072± 0.020	0.050± 0.013
	K^{40}	< 0.036	< 0.025	< 0.027	< 0.031
	Co^{60}	< 0.0007	< 0.0008	< 0.0009	< 0.0012
	Nb^{95}	< 0.0009	< 0.0013	< 0.0008	< 0.0011
	Zr^{95}	< 0.0015	< 0.0009	< 0.0008	< 0.0015
	Ru^{103}	< 0.0010	< 0.0013	< 0.0010	< 0.0007
	Ru^{106}	< 0.0063	< 0.0055	< 0.0062	< 0.0036
	Cs^{134}	< 0.0007	< 0.0007	< 0.0009	< 0.0010
	Cs^{137}	< 0.0011	< 0.0004	< 0.0007	< 0.0004
	Ce^{141}	< 0.0016	< 0.0017	< 0.0010	< 0.0011
	Ce^{144}	< 0.0052	< 0.0053	< 0.0061	< 0.0030
CL-15	Be^7	0.066± 0.018	0.065 0.016	0.074± 0.018	0.051 0.012
	K^{40}	< 0.028	< 0.025	< 0.028	< 0.027
	Co^{60}	< 0.0007	< 0.0009	< 0.0008	< 0.0005
	Nb^{95}	< 0.0007	< 0.0020	< 0.0010	< 0.0008
	Zr^{95}	< 0.0008	< 0.0028	< 0.0020	< 0.0017
	Ru^{103}	< 0.0009	< 0.0008	< 0.0009	< 0.0010
	Ru^{106}	< 0.0080	< 0.0087	< 0.0089	< 0.0047
	Cs^{134}	< 0.0005	< 0.0004	< 0.0010	< 0.0010
	Cs^{137}	< 0.0009	< 0.0005	< 0.0006	< 0.0005
	Ce^{141}	< 0.0021	< 0.0019	< 0.0008	< 0.0017
	Ce^{144}	< 0.0039	< 0.0029	< 0.0065	< 0.0036
CL-94	Be^7	0.067± 0.018	0.069 0.015	0.084 0.017	0.058 0.018
	K^{40}	< 0.029	< 0.023	< 0.027	< 0.023
	Co^{60}	< 0.0007	< 0.0008	< 0.0008	< 0.0005
	Nb^{95}	< 0.0012	< 0.0016	< 0.0008	< 0.0007
	Zr^{95}	< 0.0008	< 0.0013	< 0.0011	< 0.0021
	Ru^{103}	< 0.0008	< 0.0012	< 0.0011	< 0.0011
	Ru^{106}	< 0.0066	< 0.0066	< 0.0094	< 0.0048
	Cs^{134}	< 0.0008	< 0.0005	< 0.0009	< 0.0004
	Cs^{137}	< 0.0008	< 0.0004	< 0.0005	< 0.0008
	Ce^{141}	< 0.0015	< 0.0032	< 0.0019	< 0.0017
	Ce^{144}	< 0.0063	< 0.0052	< 0.0052	< 0.0057

c All I^{131} results were < 0.07 pCi/m^3

d Control Location, all other locations are Indicator Locations.

TABLE 3

2001 QUARTERLY TLD RESULTS
(mRem / quarter net exposure)

Location	1ST QTR	2ND QTR	3RD QTR	4TH QTR
CL-1	15.2 ± 0.2	18.3 ± 0.3	17.9 ± 0.2	18.2 ± 0.7
CL-2	17.8 ± 0.2	19.9 ± 0.2	20.4 ± 0.4	19.4 ± 0.3
CL-3	17.0 ± 0.2	19.1 ± 0.2	20.1 ± 0.2	19.0 ± 0.5
CL-4	17.0 ± 0.2	16.8 ± 0.2	19.5 ± 0.2	18.5 ± 0.2
CL-5	17.6 ± 0.3	19.2 ± 0.2	19.7 ± 0.2	18.5 ± 0.2
CL-6	14.6 ± 0.2	15.7 ± 0.2	16.9 ± 0.4	15.8 ± 0.4
CL-7	15.9 ± 0.2	16.5 ± 0.2	18.8 ± 0.2	17.4 ± 0.2
CL-8	16.7 ± 0.2	18.2 ± 0.3	18.8 ± 0.3	18.0 ± 0.3
CL-11[e]	15.2 ± 0.2	16.0 ± 0.2	17.1 ± 0.2	16.2 ± 0.3
CL-15	13.4 ± 0.2	15.6 ± 0.2	16.5 ± 0.2	15.8 ± 0.3
CL-22	15.3 ± 0.2	16.9 ± 0.2	16.9 ± 0.4	17.6 ± 0.3
CL-23	13.9 ± 0.2	16.8 ± 0.2	15.4 ± 0.2	17.1 ± 0.2
CL-24	15.2 ± 0.2	17.2 ± 0.2	18.9 ± 0.2	17.2 ± 0.2
CL-33[f]	16.3 ± 0.3	18.3 ± 0.4	18.5 ± 0.3	18.7 ± 0.3
CL-34	17.5 ± 0.3	19.5 ± 0.2	20.8 ± 0.3	19.5 ± 0.4
CL-35	16.3 ± 0.2	17.2 ± 0.2	17.1 ± 0.2	17.4 ± 0.2
CL-36	17.0 ± 0.2	18.3 ± 0.3	20.8 ± 0.5	19.0 ± 0.3
CL-37	17.6 ± 0.3	18.3 ± 0.4	20.7 ± 0.3	19.3 ± 0.5
CL-41	17.6 ± 0.3	18.7 ± 0.3	20.6 ± 0.3	19.4 ± 0.3
CL-42	16.7 ± 0.2	17.2 ± 0.2	19.9 ± 0.2	17.9 ± 0.2
CL-43	17.7 ± 0.4	19.5 ± 0.2	21.9 ± 0.2	19.5 ± 0.4
CL-44	17.6 ± 0.4	18.3 ± 0.4	20.8 ± 0.4	19.3 ± 0.3
CL-45	17.8 ± 0.2	19.9 ± 0.2	21.2 ± 0.2	19.7 ± 0.2
CL-46	17.0 ± 0.2	18.0 ± 0.4	19.5 ± 0.3	18.1 ± 0.2
CL-47	17.4 ± 0.2	18.3 ± 0.2	19.6 ± 0.2	18.8 ± 0.3
CL-48	20.7 ± 0.2	18.3 ± 0.2	18.6 ± 0.2	19.5 ± 0.5
CL-49	15.6 ± 0.2	19.8 ± 0.2	20.1 ± 0.2	19.6 ± 0.2
CL-51	16.0 ± 0.2	18.4 ± 0.2	20.3 ± 0.6	19.3 ± 0.3
CL-52	17.0 ± 0.2	19.5 ± 0.2	21.0 ± 0.4	19.5 ± 0.4
CL-53	15.6 ± 0.2	19.0 ± 0.2	19.0 ± 0.3	17.6 ± 0.2
CL-54	15.5 ± 0.2	19.0 ± 0.2	20.7 ± 0.3	19.5 ± 0.4
CL-55	17.6 ± 0.3	19.1 ± 0.2	20.9 ± 0.5	19.5 ± 0.2
CL-56	17.0 ± 0.2	19.9 ± 0.2	21.0 ± 0.2	21.0 ± 0.2
CL-57	15.6 ± 0.2	19.1 ± 0.2	21.5 ± 0.2	18.8 ± 0.2
CL-58	16.3 ± 0.2	18.4 ± 0.2	20.9 ± 0.2	19.4 ± 0.3
CL-60	17.0 ± 0.2	19.1 ± 0.2	20.7 ± 0.3	19.6 ± 0.4
CL-61	16.3 ± 0.2	19.4 ± 0.2	19.6 ± 0.2	20.5 ± 0.2
CL-63	16.3 ± 0.2	19.5 ± 0.2	20.2 ± 0.2	19.5 ± 0.3
CL-64	14.8 ± 0.2	19.5 ± 0.3	19.4 ± 0.2	19.3 ± 0.3
CL-65	17.8 ± 0.2	19.2 ± 0.2	20.6 ± 0.3	19.4 ± 0.3
CL-74	14.8 ± 0.2	15.2 ± 0.2	16.5 ± 0.3	16.7 ± 0.2
CL-75	15.9 ± 0.2	19.2 ± 0.2	19.2 ± 0.2	19.1 ± 0.3
CL-76	16.6 ± 0.2	19.8 ± 0.2	19.7 ± 0.2	19.5 ± 0.2
CL-77	16.0 ± 0.2	19.1 ± 0.2	18.8 ± 0.2	19.0 ± 0.4
CL-78	15.9 ± 0.2	19.5 ± 0.2	19.3 ± 0.2	19.7 ± 0.2

e ODCM Control Location
f Supplemental Control Locations

TABLE 3 (continued)

Location	1ST QTR	2ND QTR	3RD QTR	4TH QTR
CL-79	16.1 ± 0.2	19.8 ± 0.2	20.7 ± 0.4	18.6 ± 0.3
CL-80	17.0 ± 0.2	19.1 ± 0.2	20.8 ± 0.3	18.9 ± 0.2
CL-81	17.6 ± 0.3	21.0 ± 0.2	20.0 ± 0.2	20.9 ± 0.3
CL-84	16.3 ± 0.2	18.2 ± 0.3	18.2 ± 0.2	18.1 ± 0.2
CL-90	13.1 ± 0.2	15.1 ± 0.4	13.9 ± 0.2	14.6 ± 0.3
CL-91	14.8 ± 0.2	17.2 ± 0.2	17.0 ± 0.4	17.8 ± 0.3
CL-97[f]	16.3 ± 0.2	18.2 ± 0.2	18.5 ± 0.2	19.5 ± 0.3
CL-99	14.1 ± 0.2	14.7 ± 0.4	15.9 ± 0.2	15.9 ± 0.5
CL-114[f]	15.2 ± 0.2	15.7 ± 0.2	15.0 ± 0.3	15.8 ± 0.3

f Supplemental control locations

TABLE 4

CL-13 SURFACE WATER ACTIVITY
(pCi/l)

Date Collected	30 Jan 01	28 Feb 01	28 Mar 01	25 Apr 01	30 May 01	27 Jun 01
Gross Beta	3.2 ± 0.6	2.4 ± 0.5	2.3 ± 0.5	3.0 ± 0.7	3.7 ± 0.3	2.6 ± 0.4
Be^{7}	< 44.3	< 29.0	< 48.2	< 50.0	< 73.6	< 15.2
K^{40}	< 48.8	< 54.0	< 91.8	< 103.3	< 106.1	< 25.3
Mn^{54}	< 6.3	< 1.6	< 2.2	< 4.1	< 3.6	< 1.3
Fe^{59}	< 5.2	< 5.7	< 4.3	< 10.7	< 12.1	< 4.2
Co^{58}	< 5.6	< 2.8	< 2.7	< 5.7	< 6.9	< 1.4
Co^{60}	< 4.6	< 1.7	< 1.5	< 5.0	< 4.5	< 1.4
Zn^{65}	< 9.5	< 3.2	< 4.2	< 3.4	< 4.6	< 1.7
Nb^{95}	< 3.7	< 3.4	< 4.3	< 9.1	< 6.7	< 2.0
Zr^{95}	< 8.0	< 4.1	< 7.9	< 10.5	< 12.3	< 3.1
Cs^{134}	< 4.0	< 2.5	< 3.1	< 7.0	< 5.1	< 1.3
Cs^{137}	< 4.9	< 2.3	< 2.7	< 5.5	< 2.7	< 0.9
Ba^{140}	< 29.1	< 26.8	< 55.4	< 48.9	< 55.6	< 19.1
La^{140}	< 9.9	< 3.3	< 12.4	< 7.0	< 14.8	< 7.0
Ce^{144}	< 35.2	< 14.0	< 27.2	< 51.0	< 32.4	< 13.0

Date Collected	25 Jul 01	29 Aug 01	26 Sep 01	24 Oct 01	28 Nov 01	26 Dec 01
Gross Beta	3.2 ± 0.6	3.0 ± 0.4	2.9 ± 0.5	3.1 ± 0.5	3.0 ± 0.6	2.6 ± 0.3
Be^{7}	< 19.7	< 30.4	< 20.4	< 31.1	< 29.2	< 44.8
K^{40}	< 68.7	< 82.6	< 38.8	< 106.5	< 66.7	< 104.6
Mn^{54}	< 2.9	< 3.6	< 2.0	< 2.8	< 3.7	< 6.0
Fe^{59}	< 5.9	< 9.1	< 3.8	< 12.7	< 4.4	< 8.2
Co^{58}	< 3.3	< 3.2	< 1.2	< 4.9	< 3.3	< 5.3
Co^{60}	< 3.0	< 3.3	< 2.0	< 6.7	< 3.5	< 3.5
Zn^{65}	< 4.8	< 6.7	< 4.2	< 7.6	< 5.7	< 12.3
Nb^{95}	< 2.3	< 3.8	< 1.9	< 3.8	< 1.3	< 6.4
Zr^{95}	< 5.9	< 4.7	< 4.2	< 6.0	< 4.9	< 15.5
Cs^{134}	< 2.5	< 3.4	< 1.2	< 4.9	< 4.8	< 4.8
Cs^{137}	< 2.7	< 2.5	< 1.4	< 5.0	< 4.1	< 6.4
Ba^{140}	< 31.2	< 23.3	< 13.0	< 44.2	< 16.6	< 33.8
La^{140}	< 5.4	< 4.7	< 3.8	< 9.5	< 4.2	< 3.9
Ce^{144}	< 25.9	< 17.9	< 18.2	< 38.0	< 33.9	< 45.7

TABLE 5

CL-90 SURFACE WATER ACTIVITY (pCi/l)

Date Collected	30 Jan 01	28 Feb 01	28 Mar 01	25 Apr 01	30 May 01	27 Jun 01
Gross Alpha	0.6 ± 0.3	< 0.9	< 0.4	< 0.5	2.4 ± 0.5	0.8 ± 0.5
Gross Beta	1.9 ± 0.4	2.9 ± 0.4	2.6 ± 0.4	2.6 ± 0.5	4.5 ± 0.4	2.7 ± 0.5
I^{131}	< 0.3	< 0.4	< 0.3	< 0.3	< 0.4	< 0.4
Be^{7}	< 37.0	< 52.1	< 41.7	< 38.3	< 42.2	< 33.1
K^{40}	< 20.8	< 38.6	< 100.9	< 103.6	< 70.1	< 88.8
Mn^{54}	< 2.6	< 5.1	< 4.5	< 2.0	< 2.8	< 2.5
Fe^{59}	< 10.2	< 4.4	< 6.9	< 4.5	< 5.2	< 6.5
Co^{58}	< 3.0	< 3.8	< 4.8	< 2.0	< 3.3	< 2.5
Co^{60}	< 2.1	< 2.7	< 3.3	< 1.6	< 2.0	< 2.0
Zn^{65}	< 6.1	< 9.9	< 9.4	< 5.7	< 5.1	< 5.0
Nb^{95}	< 3.0	< 3.5	< 4.5	< 3.7	< 2.7	< 2.2
Zr^{95}	< 7.9	< 7.3	< 6.6	< 5.1	< 7.7	< 5.9
Cs^{134}	< 3.4	< 4.8	< 4.7	< 3.5	< 2.6	< 2.3
Cs^{137}	< 3.4	< 3.6	< 5.5	< 3.4	< 3.4	< 4.3
Ba^{140}	< 11.9	< 19.0	< 13.0	< 14.9	< 16.2	< 21.6
La^{140}	< 4.7	< 2.8	< 5.6	< 4.4	< 3.6	< 3.4
Ce^{144}	< 26.0	< 55.1	< 44.2	< 36.9	< 27.0	< 31.1
Date Collected	**25 Jul 01**	**29 Aug 01**	**26 Sep 01**	**24 Oct 01**	**28 Nov 01**	**26 Dec 01**
Gross Alpha	1.0 ± 0.4	0.9 ± 0.4	1.0 ± 0.4	< 0.4	1.1 ± 0.5	< 0.5
Gross Beta	2.3 ± 0.4	2.7 ± 0.4	3.0 ± 0.5	2.6 ± 0.5	2.6 ± 0.5	4.3 ± 0.5
I^{131}	< 0.2	< 0.4	< 0.2	< 0.5	< 0.3	< 0.5
Be^{7}	< 17.7	< 58.0	< 48.1	< 31.3	< 24.9	< 53.2
K^{40}	< 48.3	< 91.6	< 138.8	< 75.8	< 83.7	< 137.6
Mn^{54}	< 2.1	< 5.0	< 4.6	< 2.1	< 3.8	< 4.4
Fe^{59}	< 3.2	< 3.2	< 9.9	< 3.4	< 6.9	< 10.2
Co^{58}	< 2.5	< 5.0	< 5.3	< 1.9	< 3.4	< 2.2
Co^{60}	< 1.4	< 2.4	< 6.0	< 1.7	< 4.5	< 6.4
Zn^{65}	< 3.5	< 8.1	< 6.2	< 3.0	< 8.4	< 6.7
Nb^{95}	< 2.4	< 2.7	< 4.3	< 3.0	< 2.2	< 5.7
Zr^{95}	< 4.7	< 13.0	< 10.9	< 6.4	< 4.2	< 12.9
Cs^{134}	< 2.1	< 5.5	< 4.8	< 2.0	< 3.8	< 4.2
Cs^{137}	< 2.0	< 4.9	< 5.0	< 2.3	< 4.8	< 4.1
Ba^{140}	< 17.8	< 28.9	< 22.3	< 12.7	< 17.4	< 27.8
La^{140}	< 1.8	< 2.5	< 3.1	< 2.3	< 3.8	< 6.6
Ce^{144}	< 16.8	< 41.2	< 51.6	< 40.5	< 31.4	< 40.1

TABLE 6

CL-91 SURFACE WATER ACTIVITY
(pCi/l)

Date Collected	30 Jan 01	28 Feb 01	28 Mar 01[g]	25 Apr 01	30 May 01	27 Jun 01
Gross Alpha	0.7 ± 0.3	< 0.9 ± 0.6	-	0.8 ± 0.5	0.7 ± 0.4	0.9 ± 0.5
Gross Beta	2.6 ± 0.3	2.1 ± 0.6	-	2.0 ± 0.6	2.7 ± 0.5	2.4 ± 0.6
Be^{7}	< 35.7	< 44.8	-	< 57.0	< 26.0	< 33.9
K^{40}	< 30.2	< 98.9	-	< 105.4	< 66.1	< 52.2
Mn^{54}	< 2.4	< 4.4	-	< 5.4	< 2.2	< 3.2
Fe^{59}	< 9.6	< 12.4	-	< 13.4	< 4.3	< 3.9
Co^{58}	< 2.4	< 3.7	-	< 4.9	< 4.0	< 2.1
Co^{60}	< 2.5	< 4.3	-	< 4.7	< 1.7	< 2.6
Zn^{65}	< 3.0	< 3.8	-	< 3.3	< 6.0	< 4.1
Nb^{95}	< 3.1	< 7.2	-	< 5.8	< 4.5	< 5.6
Zr^{95}	< 7.3	< 13.9	-	< 12.1	< 7.8	< 7.1
Cs^{134}	< 5.5	< 3.6	-	< 4.0	< 2.5	< 2.4
Cs^{137}	< 3.3	< 4.9	-	< 4.7	< 2.6	< 2.8
Ba^{140}	< 11.8	< 34.0	-	< 36.4	< 35.1	< 59.7
La^{140}	< 4.4	< 6.5	-	< 13.8	< 4.7	< 7.0
Ce^{144}	< 27.4	< 51.1	-	< 50.5	< 16.8	< 24.6

Date Collected	25 Jul 01	29 Aug 01	26 Sep 01	24 Oct 01	28 Nov 01	26 Dec 01
Gross Alpha	1.3 ± 0.5	1.7 ± 0.5	3.0 ± 0.7[h]	1.0 ± 0.5	< 1.0	0.7 ± 0.5
Gross Beta	2.8 ± 0.6	3.3 ± 0.6	3.4 ± 0.7	2.7 ± 0.6	2.8 ± 0.6	2.9 ± 0.6
Be^{7}	< 38.9	< 35.2	< 39.9	< 44.3	< 43.4	< 50.1
K^{40}	< 73.8	< 69.1	< 72.9	< 128.7	< 110.3	< 108.6
Mn^{54}	< 2.4	< 2.6	< 4.0	< 3.9	< 3.3	< 5.6
Fe^{59}	< 6.6	< 4.2	< 7.2	< 4.8	< 9.9	< 8.9
Co^{58}	< 2.2	< 1.5	< 2.0	< 4.8	< 5.6	< 3.7
Co^{60}	< 1.9	< 2.4	< 3.3	< 2.4	< 6.1	< 7.0
Zn^{65}	< 2.6	< 2.9	< 2.6	< 9.4	< 14.3	< 7.2
Nb^{95}	< 4.8	< 2.9	< 5.1	< 5.9	< 4.1	< 5.5
Zr^{95}	< 7.0	< 5.0	< 6.5	< 12.4	< 5.9	< 9.1
Cs^{134}	< 1.6	< 3.4	< 2.4	< 6.4	< 4.8	< 6.4
Cs^{137}	< 2.7	< 3.7	< 3.9	< 4.1	< 6.2	< 6.8
Ba^{140}	< 41.9	< 24.1	< 27.6	< 50.9	< 14.6	< 33.5
La^{140}	< 8.2	< 7.4	< 10.1	< 5.4	< 5.0	< 5.2
Ce^{144}	< 34.0	< 26.7	< 32.6	< 48.0	< 35.3	< 39.9

g No sample; refer to Appendix D, Exceptions to REMP during 2001.
h Gross Alpha was repeated with a result of 2.8 ± 0.6 pCi/L.

TABLE 7

CL-99 SURFACE WATER ACTIVITY
(pCi/l)

Date Collected	30 Jan 01	28 Feb 01	28 Mar 01[g]	25 Apr 01	30 May 01	27 Jun 01
Gross Alpha	< 0.9	< 1.0	-	< 0.8	< 0.7	< 0.9
Gross Beta	1.3 ± 0.8	2.5 ± 0.8	-	1.8 ± 0.8	1.5 ± 0.6	1.1 ± 0.8
Be^7	< 22.1	< 51.7	-	< 41.0	< 59.5	< 44.0
K^{40}	< 26.2	< 98.3	-	< 108.1	< 88.2	< 73.3
Mn^{54}	< 1.6	< 4.7	-	< 5.9	< 4.4	< 3.1
Fe^{59}	< 3.7	< 5.5	-	< 9.5	< 8.1	< 8.9
Co^{58}	< 1.2	< 5.0	-	< 5.5	< 4.3	< 2.8
Co^{60}	< 1.9	< 4.6	-	< 4.5	< 1.6	< 2.4
Zn^{65}	< 2.4	< 8.0	-	< 6.7	< 5.5	< 2.4
Nb^{95}	< 2.1	< 4.7	-	< 5.4	< 4.6	< 3.5
Zr^{95}	< 4.0	< 11.9	-	< 9.1	< 7.1	< 4.3
Cs^{134}	< 2.6	< 6.5	-	< 6.1	< 3.2	< 4.2
Cs^{137}	< 1.4	< 4.5	-	< 6.5	< 3.3	< 1.3
Ba^{140}	< 10.0	< 48.6	-	< 49.1	< 50.1	< 46.1
La^{140}	< 4.5	< 9.6	-	< 9.2	< 8.5	< 8.9
Ce^{144}	< 26.7	< 45.3	-	< 50.7	< 41.9	< 31.5

Date Collected	25 Jul 01	29 Aug 01	26 Sep 01	24 Oct 01	28 Nov 01	26 Dec 01
Gross Alpha	1.4 ± 0.7	2.8 ± 0.8	1.2 ± 0.8	< 1.1	< 1.5	< 1.1
Gross Beta	3.3 ± 0.7	4.5 ± 0.9	7.4 ± 0.9[i]	6.4 ± 0.9	4.5 ± 0.9	2.7 ± 0.8
Be^7	< 39.1	< 30.1	< 27.3	< 50.9	< 18.3	< 41.9
K^{40}	< 85.3	< 66.7	< 41.4	< 99.2	< 79.3	< 115.4
Mn^{54}	< 3.7	< 1.8	< 1.8	< 5.7	< 4.1	< 5.9
Fe^{59}	< 6.6	< 8.5	< 3.2	< 7.2	< 6.2	< 9.8
Co^{58}	< 3.6	< 3.3	< 1.4	< 5.4	< 4.8	< 4.0
Co^{60}	< 2.5	< 1.6	< 1.7	< 3.9	< 3.6	< 4.5
Zn^{65}	< 8.2	< 5.0	< 3.0	< 4.9	< 4.3	< 6.2
Nb^{95}	< 3.3	< 2.5	< 2.5	< 5.6	< 2.7	< 6.3
Zr^{95}	< 4.5	< 5.4	< 3.8	< 9.9	< 6.5	< 6.8
Cs^{134}	< 3.0	< 3.3	< 2.2	< 5.0	< 4.4	< 2.9
Cs^{137}	< 3.1	< 2.8	< 2.0	< 5.1	< 5.7	< 7.0
Ba^{140}	< 32.6	< 22.7	< 26.1	< 44.2	< 20.9	< 24.2
La^{140}	< 10.0	< 10.6	< 1.9	< 4.8	< 5.1	< 4.1
Ce^{144}	< 42.1	< 31.0	< 14.5	< 52.4	< 27.2	< 44.0

g No sample; refer to Appendix D, Exceptions to REMP during 2001.
i Gross Beta was repeated with a result of 7.8 ± 0.9 pCi/L.

TABLE 8

SURFACE WATER and DRINKING WATER QUARTERLY TRITIUM COMPOSITE
(pCi/l)

Quarter	CL-13	CL-14	CL-90	CL-91	CL-99
1^{st}	< 184	< 184	< 184	< 184	< 184
2^{nd}	< 150	< 150	< 150	< 150	< 150
3^{rd}	< 160	< 160	< 160	< 160	< 160
4^{th}	< 164	< 164	< 164	< 164	< 164

TABLE E 9

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

Date Collected	28 Mar 01	27 Jun 01	26 Sep 01	26 Dec 01
Gross Alpha	< 0.8	< 0.8	1.1 ± 0.7	0.8 ± 0.6
Gross Beta	< 0.9	< 1.2	2.3 ± 0.8	< 1.2
H^{3}	< 182	< 168	< 153	< 164
I^{131}	< 0.3	< 0.4	< 0.2	< 0.4
Be^{7}	< 37.7	< 29.2	< 59.4	< 23.0
K^{40}	< 71.9	< 47.1	< 94.8	< 46.8
Mn^{54}	< 6.0	< 2.2	< 3.9	< 1.8
Fe^{59}	< 3.5	< 4.1	< 5.6	< 4.7
Co^{58}	< 4.4	< 3.3	< 5.2	< 1.5
Co^{60}	< 2.0	< 2.6	< 2.7	< 2.0
Zn^{65}	< 6.7	< 3.8	< 8.0	< 3.2
Nb^{95}	< 4.1	< 4.5	< 5.3	< 3.0
Zr^{95}	< 9.9	< 6.2	< 8.6	< 3.7
Cs^{134}	< 5.0	< 2.3	< 3.6	< 2.5
Cs^{137}	< 3.2	< 2.4	< 3.7	< 2.1
Ba^{140}	< 13.9	< 30.7	< 29.5	< 13.8
La^{140}	< 2.8	< 5.7	< 2.9	< 2.9
Ce^{144}	< 21.3	< 16.5	< 49.2	< 21.7

TABLE 10

CL-12 UNTREATED WELL WATER ACTIVITY

(pCi/l)

Date Collected	28 Mar 01	27 Jun 01	26 Sep 01	26 Dec 01
Gross Alpha	< 1.8	< 1.9	< 1.8	< 2.4
Gross Beta	1.9 ± 1.3	< 2.2	< 2.1	< 2.1
H^3	< 182	< 168	< 153	< 164
I^{131}	< 0.4	< 0.4	< 0.2	< 0.4
Be^7	< 45.5	< 30.4	< 20.4	< 35.5
K^{40}	< 120.0	< 41.8	< 41.2	< 73.2
Mn^{54}	< 5.1	< 2.4	< 1.7	< 2.9
Fe^{59}	< 13.4	< 6.5	< 3.7	< 5.4
Co^{58}	< 5.1	< 1.5	< 1.6	< 3.2
Co^{60}	< 5.4	< 1.7	< 1.6	< 3.6
Zn^{65}	< 5.1	< 2.3	< 2.4	< 3.3
Nb^{95}	< 9.7	< 3.4	< 2.6	< 4.3
Zr^{95}	< 6.9	< 7.2	< 2.7	< 7.9
Cs^{134}	< 3.2	< 2.6	< 1.0	< 4.0
Cs^{137}	< 6.2	< 2.1	< 1.7	< 3.6
Ba^{140}	< 57.7	< 53.9	< 10.1	< 22.7
La^{140}	< 9.1	< 12.4	< 2.6	< 4.6
Ce^{144}	< 36.7	< 22.8	< 16.8	< 48.7

TABLE 11

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

Date Collected	28 Mar 01	27 Jun 01	26 Sep 01	26 Dec 01
Gross Alpha	< 2.0	< 1.6	< 1.7	< 2.3
Gross Beta	< 1.8	< 2.1	2.4 ± 1.5	2.4 ± 1.7
H^3	< 182	< 168	< 153	< 164
I^{131}	< 0.3	< 0.4	< 0.2	< 0.4
Be^7	< 32.5	< 43.5	< 11.9	< 30.0
K^{40}	< 77.5	< 68.9	< 31.4	< 61.9
Mn^{54}	< 2.6	< 1.6	< 1.1	< 2.6
Fe^{59}	< 3.0	< 5.7	< 3.1	< 4.9
Co^{58}	< 3.2	< 1.9	< 1.3	< 2.7
Co^{60}	< 1.5	< 1.5	< 1.0	< 2.4
Zn^{65}	< 4.5	< 3.7	< 3.1	< 2.7
Nb^{95}	< 5.3	< 4.1	< 2.2	< 3.5
Zr^{95}	< 7.1	< 4.1	< 3.6	< 4.0
Cs^{134}	< 2.0	< 2.3	< 1.9	< 2.8
Cs^{137}	< 2.0	< 3.7	< 1.3	< 3.2
Ba^{140}	< 42.5	< 52.2	< 8.0	< 22.6
La^{140}	< 11.7	< 7.4	< 1.5	< 2.2
Ce^{144}	< 36.0	< 27.8	< 12.5	< 20.9

TABLE 12

CL-14 DRINKING WATER ACTIVITY
(pCi/l)

Date Collected	30 Jan 01	28 Feb 01	28 Mar 01	25 Apr 01	30 May 01	27 Jun 01
Gross Alpha	0.6 ± 0.4	< 0.4	0.7 ± 0.5	< 0.5	1.1 ± 0.3	< 0.5
Gross Beta	0.9 ± 0.3	1.3 ± 0.3	1.4 ± 0.3	1.4 ± 0.3	2.1 ± 0.3	1.4 ± 0.3
Be^{7}	< 53.3	< 38.0	< 77.7	< 41.6	< 26.5	< 31.6
K^{40}	< 75.2	< 76.9	< 125.9	< 79.4	< 69.6	< 72.4
Mn^{54}	< 5.3	< 3.1	< 5.2	< 2.4	< 3.6	< 3.4
Fe^{59}	< 4.9	< 6.4	< 4.5	< 5.6	< 6.9	< 7.3
Co^{58}	< 3.6	< 2.6	< 5.4	< 5.1	< 3.9	< 3.7
Co^{60}	< 2.3	< 4.4	< 4.0	< 1.9	< 3.7	< 2.6
Zn^{65}	< 2.8	< 4.7	< 6.1	< 6.0	< 4.9	< 5.1
Nb^{95}	< 3.8	< 5.0	< 5.7	< 5.4	< 4.0	< 5.3
Zr^{95}	< 7.8	< 7.9	< 12.6	< 6.8	< 5.0	< 6.2
Cs^{134}	< 3.3	< 2.2	< 6.2	< 2.2	< 3.3	< 3.5
Cs^{137}	< 4.4	< 3.1	< 3.7	< 5.9	< 3.2	< 2.8
Ba^{140}	< 28.5	< 36.5	< 33.3	< 38.5	< 25.8	< 59.7
La^{140}	< 4.5	< 5.8	< 7.5	< 5.6	< 3.0	< 13.0
Ce^{144}	< 46.7	< 24.4	< 56.0	< 34.9	< 32.7	< 34.4

Date Collected	25 Jul 01	29 Aug 01	26 Sep 01	24 Oct 01	28 Nov 01	26 Dec 01
Gross Alpha	< 0.6	0.7 ± 0.4	< 0.5	0.7 ± 0.4	0.8 ± 0.5	0.8 ± 0.4
Gross Beta	1.6 ± 0.3	1.2 ± 0.3	1.0 ± 0.3	1.1 ± 0.3	1.4 ± 0.3	1.5 ± 0.3
Be^{7}	< 28.4	< 25.7	< 33.7	< 41.3	< 44.6	< 52.9
K^{40}	< 47.5	< 74.7	< 58.2	< 111.4	< 95.3	< 110.4
Mn^{54}	< 2.5	< 2.2	< 2.9	< 2.6	< 3.4	< 3.1
Fe^{59}	< 6.9	< 4.8	< 4.5	< 11.5	< 4.5	< 7.4
Co^{58}	< 2.3	< 3.1	< 2.1	< 5.1	< 3.1	< 2.6
Co^{60}	< 2.0	< 3.7	< 2.6	< 6.6	< 2.1	< 5.8
Zn^{65}	< 2.5	< 3.1	< 5.2	< 5.8	< 5.5	< 10.4
Nb^{95}	< 3.4	< 3.9	< 3.2	< 5.6	< 4.5	< 6.0
Zr^{95}	< 4.3	< 6.0	< 4.2	< 6.8	< 5.6	< 8.8
Cs^{134}	< 3.1	< 2.6	< 2.4	< 4.1	< 5.1	< 4.2
Cs^{137}	< 3.1	< 2.9	< 2.4	< 5.6	< 5.1	< 5.2
Ba^{140}	< 53.4	< 23.5	< 28.1	< 33.0	< 34.2	< 29.2
La^{140}	< 12.2	< 5.4	< 5.9	< 10.4	< 3.3	< 7.6
Ce^{144}	< 16.5	< 12.7	< 24.4	< 47.8	< 49.6	< 28.9

TABLE 13

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

Date Collected	31 Jan 01	01 Mar 01	28 Mar 01	25 Apr 01	09 May 01
I^{131}	< 0.3	< 0.4	< 0.3	< 0.3	< 0.4
Sr^{90}	1.5 ± 0.4	2.1 ± 0.8	1.6 ± 0.4	1.1 ± 0.4	1.1 ± 0.3
Be^{7}	< 28.6	< 22.0	< 38.6	< 22.6	< 40.9
K^{40}	1271 ± 159	1291 ± 164	1074 ± 179	1147 ± 134	1251 ± 163
Mn^{54}	< 5.0	< 3.5	< 6.6	< 3.8	< 4.6
Fe^{59}	< 10.2	< 11.4	< 11.2	< 3.9	< 10.6
Co^{58}	< 2.5	< 2.0	< 3.9	< 3.6	< 3.4
Co^{60}	< 3.7	< 4.3	< 5.8	< 2.7	< 7.0
Zn^{65}	< 11.2	< 6.6	< 15.9	< 5.6	< 8.3
Nb^{95}	< 4.0	< 3.3	< 6.8	< 3.7	< 4.9
Zr^{95}	< 5.8	< 11.3	< 7.5	< 7.7	< 7.0
Cs^{134}	< 4.2	< 4.2	< 3.1	< 5.4	< 8.6
Cs^{137}	< 4.5	< 5.0	< 5.6	< 3.7	< 4.3
Ba^{140}	< 15.5	< 17.3	< 26.8	< 19.6	< 21.7
La^{140}	< 4.5	< 3.3	< 2.8	< 3.6	< 2.8
Ce^{144}	< 33.9	< 37.8	< 53.2	< 32.8	< 36.4

Date Collected	23 May 01	06 Jun 01	20 Jun 01	03 Jul 01	18 Jul 01
I^{131}	< 0.5	< 0.4	< 0.3	< 0.5	< 0.4
Sr^{90}	1.0 ± 0.4	1.2 ± 0.4	0.9 ± 0.4	1.2 ± 0.3	0.5 ± 0.3
Be^{7}	< 51.8	< 39.6	< 44.2	< 55.7	< 51.6
K^{40}	1351 ± 185	1320 ± 148	1289 ± 149	1342 ± 170	1482 ± 166
Mn^{54}	< 7.0	< 4.3	< 5.0	< 3.8	< 4.2
Fe^{59}	< 10.5	< 11.7	< 13.6	< 8.7	< 6.0
Co^{58}	< 4.8	< 5.0	< 2.8	< 3.7	< 5.8
Co^{60}	< 5.4	< 4.5	< 3.4	< 3.9	< 6.7
Zn^{65}	< 8.4	< 10.4	< 9.5	< 8.3	< 9.0
Nb^{95}	< 9.4	< 4.0	< 5.1	< 4.3	< 5.1
Zr^{95}	< 13.3	< 7.2	< 9.5	< 7.1	< 10.2
Cs^{134}	< 8.0	< 6.1	< 4.1	< 4.2	< 4.7
Cs^{137}	< 7.5	< 6.6	< 5.6	< 7.2	< 7.1
Ba^{140}	< 27.6	< 19.4	< 12.0	< 23.7	< 23.6
La^{140}	< 3.5	< 6.1	< 1.6	< 4.9	< 9.4
Ce^{144}	< 51.4	< 43.0	< 29.2	< 50.8	< 46.4

TABLE 13 (continued)

Date Collected	01 Aug 01	15 Aug 01	29 Aug 01	12 Sep 01	26 Sep 01
I^{131}	< 0.5	< 0.4	< 0.4	< 0.3	< 0.2
Sr^{90}	0.7 ± 0.3	0.5 ± 0.2	2.5 ± 0.5	3.1 ± 1.0	< 0.5
Be^{7}	< 42.9	< 31.0	< 51.1	< 24.4	< 51.1
K^{40}	1390 ± 154	1384 ± 126	1299 ± 165	1353 ± 106	1295 ± 168
Mn^{54}	< 3.4	< 3.7	< 3.2	< 2.4	< 5.6
Fe^{59}	< 11.7	< 5.0	< 11.1	< 7.2	< 10.5
Co^{58}	< 5.0	< 2.0	< 7.0	< 1.8	< 5.9
Co^{60}	< 2.1	< 3.6	< 6.0	< 3.2	< 4.2
Zn^{65}	< 7.1	< 9.5	< 9.4	< 6.8	< 12.2
Nb^{95}	< 5.1	< 4.2	< 6.2	< 2.9	< 3.5
Zr^{95}	< 11.0	< 5.8	< 8.6	< 7.1	< 14.5
Cs^{134}	< 7.4	< 2.3	< 6.0	< 5.1	< 5.5
Cs^{137}	< 6.2	< 4.2	< 5.4	< 3.8	< 8.7
Ba^{140}	< 29.0	< 13.0	< 17.8	< 10.8	< 18.9
La^{140}	< 3.7	< 4.4	< 2.9	< 2.4	< 2.7
Ce^{144}	< 37.7	< 33.4	< 48.3	< 29.9	< 36.3

Date Collected	11 Oct 01	24 Oct 01	28 Nov 01	26 Dec 01
I^{131}	< 0.4	< 0.5	< 0.4	< 0.4
Sr^{90}	0.7 ± 0.3	0.9 ± 0.3	0.7 ± 0.3	0.7 ± 0.3
Be^{7}	< 21.8	< 54.5	< 24.5	< 43.6
K^{40}	1093 ± 98	1253 ± 155	1319 ± 113	1280 ± 168
Mn^{54}	< 2.4	< 4.3	< 4.5	< 6.7
Fe^{59}	< 6.0	< 9.2	< 4.4	< 15.6
Co^{58}	< 3.3	< 6.0	< 3.0	< 5.0
Co^{60}	< 2.8	< 3.9	< 3.3	< 6.7
Zn^{65}	< 6.8	< 10.5	< 6.0	< 9.4
Nb^{95}	< 3.5	< 5.2	< 2.7	< 6.9
Zr^{95}	< 6.1	< 14.2	< 4.4	< 10.0
Cs^{134}	< 3.1	< 4.3	< 4.3	< 4.5
Cs^{137}	< 2.3	< 4.3	< 4.1	< 6.9
Ba^{140}	< 11.8	< 26.3	< 12.9	< 32.7
La^{140}	< 3.8	< 2.3	< 2.7	< 3.7
Ce^{144}	< 23.3	< 47.6	< 28.3	< 42.6

TABLE 14

CL-1 GRASS ACTIVITY
(pCi/g wet)

Date Collected	25 Apr 01	09 May 01	23 May 01	06 Jun 01	20 Jun 01
Be^{7}	1.01 ± 0.23	0.76 ± 0.20	0.61 ± 0.18	1.58 ± 0.22	1.02 ± 0.21
K^{40}	5.36 ± 0.57	9.44 ± 0.67	5.48 ± 0.46	4.30 ± 0.41	5.17 ± 0.40
Mn^{54}	< 0.015	< 0.012	< 0.015	< 0.014	< 0.012
Fe^{59}	< 0.020	< 0.038	< 0.023	< 0.019	< 0.022
Co^{58}	< 0.025	< 0.017	< 0.010	< 0.007	< 0.010
Co^{60}	< 0.019	< 0.019	< 0.013	< 0.016	< 0.008
Zn^{65}	< 0.035	< 0.035	< 0.027	< 0.020	< 0.026
Nb^{95}	< 0.011	< 0.012	< 0.008	< 0.008	< 0.009
Zr^{95}	< 0.035	< 0.024	< 0.032	< 0.025	< 0.032
I^{131}	< 0.038	< 0.039	< 0.020	< 0.018	< 0.018
Cs^{134}	< 0.025	< 0.022	< 0.018	< 0.010	< 0.014
Cs^{137}	< 0.017	< 0.017	< 0.012	< 0.010	< 0.012
Ba^{140}	< 0.108	< 0.077	< 0.046	< 0.050	< 0.053
La^{140}	< 0.018	< 0.014	< 0.006	< 0.012	< 0.011
Ce^{144}	< 0.141	< 0.103	< 0.113	< 0.110	< 0.095

Date Collected	03 Jul 01	18 Jul 01	01 Aug 01	15 Aug 01	29 Aug 01
Be^{7}	0.60 ± 0.22	0.19 ± 0.11	2.23 ± 0.30	1.02 ± 0.30	1.29 ± 0.24
K^{40}	4.77 ± 0.48	3.34 ± 0.42	5.67 ± 0.58	5.54 ± 0.72	4.93 ± 0.46
Mn^{54}	< 0.012	< 0.014	< 0.018	< 0.016	< 0.014
Fe^{59}	< 0.031	< 0.021	< 0.035	< 0.062	< 0.028
Co^{58}	< 0.015	< 0.013	< 0.018	< 0.016	< 0.013
Co^{60}	< 0.012	< 0.010	< 0.018	< 0.027	< 0.014
Zn^{65}	< 0.025	< 0.022	< 0.021	< 0.034	< 0.039
Nb^{95}	< 0.016	< 0.007	< 0.012	< 0.015	< 0.007
Zr^{95}	< 0.022	< 0.022	< 0.038	< 0.052	< 0.036
I^{131}	< 0.018	< 0.012	< 0.022	< 0.028	< 0.027
Cs^{134}	< 0.014	< 0.013	< 0.019	< 0.025	< 0.013
Cs^{137}	< 0.016	< 0.013	< 0.017	< 0.028	< 0.019
Ba^{140}	< 0.051	< 0.052	< 0.099	< 0.098	< 0.033
La^{140}	< 0.010	< 0.014	< 0.015	< 0.018	< 0.013
Ce^{144}	< 0.100	< 0.039	< 0.114	< 0.188	< 0.151

TABLE 14 (continued)

Date Collected	12 Sep 01	26 Sep 01	11 Oct 01	24 Oct 01
Be^{7}	1.26 ± 0.16	2.02 ± 0.27	1.61 ± 0.28	2.30 ± 0.22
K^{40}	5.45 ± 0.43	5.72 ± 0.49	5.10 ± 0.60	5.21 ± 0.43
Mn^{54}	< 0.016	< 0.016	< 0.022	< 0.016
Fe^{59}	< 0.021	< 0.026	< 0.037	< 0.015
Co^{58}	< 0.014	< 0.017	< 0.019	< 0.012
Co^{60}	< 0.006	< 0.011	< 0.012	< 0.012
Zn^{65}	< 0.019	< 0.025	< 0.038	< 0.033
Nb^{95}	< 0.013	< 0.021	< 0.024	< 0.010
Zr^{95}	< 0.024	< 0.038	< 0.036	< 0.030
I^{131}	< 0.018	< 0.018	< 0.020	< 0.021
Cs^{134}	< 0.016	< 0.014	< 0.018	< 0.012
Cs^{137}	< 0.014	< 0.020	< 0.014	< 0.014
Ba^{140}	< 0.078	< 0.068	< 0.081	< 0.060
La^{140}	< 0.010	< 0.015	< 0.011	< 0.013
Ce^{144}	< 0.045	< 0.153	< 0.093	< 0.066

TABLE 15

CL-2 GRASS ACTIVITY
(pCi/g wet)

Date Collected	25 Apr 01	09 May 01	23 May 01	06 Jun 01	20 Jun 01
Be^{7}	6.96 ± 0.44	0.42 ± 0.13	0.39 ± 0.10	1.32 ± 0.22	0.25 ± 0.13
K^{40}	3.47 ± 0.46	5.61 ± 0.42	4.82 ± 0.30	5.33 ± 0.44	5.16 ± 0.37
Mn^{54}	< 0.018	< 0.010	< 0.008	< 0.017	< 0.014
Fe^{59}	< 0.022	< 0.019	< 0.027	< 0.030	< 0.026
Co^{58}	< 0.010	< 0.007	< 0.005	< 0.008	< 0.013
Co^{60}	< 0.015	< 0.012	< 0.008	< 0.017	< 0.010
Zn^{65}	< 0.030	< 0.031	< 0.018	< 0.033	< 0.023
Nb^{95}	< 0.021	< 0.013	< 0.011	< 0.012	< 0.013
Zr^{95}	< 0.037	< 0.015	< 0.015	< 0.037	< 0.027
I^{131}	< 0.039	< 0.015	< 0.017	< 0.023	< 0.012
Cs^{134}	< 0.014	< 0.013	< 0.013	< 0.010	< 0.009
Cs^{137}	< 0.016	< 0.007	< 0.007	< 0.017	< 0.009
Ba^{140}	< 0.081	< 0.039	< 0.039	< 0.070	< 0.052
La^{140}	< 0.016	< 0.005	< 0.008	< 0.013	< 0.009
Ce^{144}	< 0.120	< 0.109	< 0.055	< 0.064	< 0.063

Date Collected	03 Jul 01	18 Jul 01	01 Aug 01	15 Aug 01	29 Aug 01
Be^{7}	0.19 ± 0.16	0.46 ± 0.27	1.07 ± 0.34	0.63 ± 0.32	0.98 ± 0.24
K^{40}	3.88 ± 0.60	4.13 ± 0.62	8.67 ± 0.96	6.39 ± 0.74	5.90 ± 0.51
Mn^{54}	< 0.018	< 0.023	< 0.027	< 0.027	< 0.014
Fe^{59}	< 0.024	< 0.034	< 0.042	< 0.035	< 0.026
Co^{58}	< 0.019	< 0.022	< 0.023	< 0.024	< 0.014
Co^{60}	< 0.023	< 0.017	< 0.038	< 0.025	< 0.017
Zn^{65}	< 0.032	< 0.053	< 0.076	< 0.045	< 0.019
Nb^{95}	< 0.021	< 0.022	< 0.027	< 0.018	< 0.011
Zr^{95}	< 0.017	< 0.026	< 0.047	< 0.044	< 0.017
I^{131}	< 0.030	< 0.032	< 0.032	< 0.042	< 0.017
Cs^{134}	< 0.019	< 0.017	< 0.036	< 0.032	< 0.012
Cs^{137}	< 0.020	< 0.020	< 0.014	< 0.026	< 0.017
Ba^{140}	< 0.091	< 0.113	< 0.082	< 0.112	< 0.062
La^{140}	< 0.013	< 0.011	< 0.015	< 0.012	< 0.008
Ce^{144}	< 0.126	< 0.111	< 0.212	< 0.219	< 0.079

TABLE 15 (continued)

Date Collected	12 Sep 01	26 Sep 01	11 Oct 01	24 Oct 01
Be^{7}	1.18 ± 0.35	1.61 ± 0.23	0.69 ± 0.20	1.54 ± 0.26
K^{40}	5.03 ± 0.72	7.61 ± 0.55	4.80 ± 0.53	5.15 ± 0.43
Mn^{54}	< 0.018	< 0.014	< 0.017	< 0.010
Fe^{59}	< 0.046	< 0.027	< 0.038	< 0.025
Co^{58}	< 0.019	< 0.010	< 0.011	< 0.009
Co^{60}	< 0.033	< 0.010	< 0.023	< 0.013
Zn^{65}	< 0.055	< 0.021	< 0.021	< 0.040
Nb^{95}	< 0.026	< 0.015	< 0.017	< 0.013
Zr^{95}	< 0.043	< 0.019	< 0.030	< 0.037
I^{131}	< 0.048	< 0.020	< 0.024	< 0.025
Cs^{134}	< 0.028	< 0.018	< 0.020	< 0.011
Cs^{137}	< 0.022	< 0.013	< 0.027	< 0.015
Ba^{140}	< 0.079	< 0.056	< 0.103	< 0.066
La^{140}	< 0.020	< 0.006	< 0.013	< 0.014
Ce^{144}	< 0.181	< 0.138	< 0.140	< 0.117

TABLE 16

CL-8 GRASS ACTIVITY
(pCi/g wet)

Date Collected	25 Apr 01	09 May 01	23 May 01	06 Jun 01	20 Jun 01
Be^{7}	0.69 ± 0.21	0.57 ± 0.18	0.61 ± 0.17	2.12 ± 0.30	1.02 ± 0.29
K^{40}	7.78 ± 0.69	10.55 ± 0.63	7.39 ± 0.55	6.02 ± 0.60	7.32 ± 0.75
Mn^{54}	< 0.016	< 0.014	< 0.011	< 0.024	< 0.032
Fe^{59}	< 0.061	< 0.038	< 0.038	< 0.023	< 0.058
Co^{58}	< 0.013	< 0.010	< 0.017	< 0.023	< 0.023
Co^{60}	< 0.016	< 0.014	< 0.013	< 0.019	< 0.023
Zn^{65}	< 0.042	< 0.033	< 0.035	< 0.017	< 0.035
Nb^{95}	< 0.023	< 0.015	< 0.015	< 0.018	< 0.020
Zr^{95}	< 0.032	< 0.021	< 0.033	< 0.059	< 0.044
I^{131}	< 0.034	< 0.023	< 0.027	< 0.029	< 0.041
Cs^{134}	< 0.013	< 0.018	< 0.015	< 0.021	< 0.029
Cs^{137}	< 0.024	< 0.017	< 0.018	< 0.022	< 0.026
Ba^{140}	< 0.087	< 0.087	< 0.103	< 0.078	< 0.083
La^{140}	< 0.012	< 0.011	< 0.012	< 0.023	< 0.016
Ce^{144}	< 0.123	< 0.115	< 0.139	< 0.177	< 0.130

Date Collected	03 Jul 01	18 Jul 01	01 Aug 01	15 Aug 01	29 Aug 01
Be^{7}	0.98 ± 0.22	0.73 ± 0.14	1.69 ± 0.33	2.62 ± 0.36	1.58 ± 0.25
K^{40}	6.42 ± 0.61	6.02 ± 0.21	6.57 ± 0.71	5.78 ± 0.56	5.84 ± 0.55
Mn^{54}	< 0.012	< 0.016	< 0.024	< 0.022	< 0.013
Fe^{59}	< 0.022	< 0.037	< 0.068	< 0.052	< 0.035
Co^{58}	< 0.009	< 0.017	< 0.013	< 0.015	< 0.010
Co^{60}	< 0.009	< 0.015	< 0.018	< 0.021	< 0.016
Zn^{65}	< 0.047	< 0.031	< 0.033	< 0.032	< 0.025
Nb^{95}	< 0.018	< 0.007	< 0.023	< 0.024	< 0.018
Zr^{95}	< 0.030	< 0.020	< 0.038	< 0.033	< 0.030
I^{131}	< 0.017	< 0.017	< 0.035	< 0.030	< 0.023
Cs^{134}	< 0.018	< 0.010	< 0.031	< 0.016	< 0.018
Cs^{137}	< 0.021	< 0.008	< 0.017	< 0.020	< 0.013
Ba^{140}	< 0.061	< 0.046	< 0.088	< 0.088	< 0.063
La^{140}	< 0.010	< 0.007	< 0.027	< 0.014	< 0.015
Ce^{144}	< 0.087	< 0.079	< 0.192	< 0.213	< 0.114

TABLE 16 (continued)

Date Collected	12 Sep 01	26 Sep 01	11 Oct 01	24 Oct 01
Be^{7}	2.91 ± 0.42	2.18 ± 0.24	4.46 ± 0.44	3.15 ± 0.34
K^{40}	9.19 ± 0.81	8.26 ± 0.58	5.57 ± 0.67	6.41 ± 0.52
Mn^{54}	< 0.025	< 0.010	< 0.027	< 0.017
Fe^{59}	< 0.033	< 0.030	< 0.047	< 0.029
Co^{58}	< 0.030	< 0.013	< 0.022	< 0.014
Co^{60}	< 0.023	< 0.014	< 0.034	< 0.019
Zn^{65}	< 0.051	< 0.027	< 0.045	< 0.026
Nb^{95}	< 0.026	< 0.012	< 0.024	< 0.017
Zr^{95}	< 0.035	< 0.019	< 0.054	< 0.042
I^{131}	< 0.050	< 0.023	< 0.042	< 0.026
Cs^{134}	< 0.027	< 0.019	< 0.031	< 0.013
Cs^{137}	< 0.026	< 0.016	< 0.030	< 0.018
Ba^{140}	< 0.156	< 0.055	< 0.134	< 0.071
La^{140}	< 0.018	< 0.010	< 0.025	< 0.011
Ce^{144}	< 0.153	< 0.073	< 0.188	< 0.106

TABLE 17

CL-116 GRASS ACTIVITY (control)

(pCi/g wet)

Date Collected	25 Apr 01	09 May 01	23 May 01	06 Jun 01	20 Jun 01
Be^7	1.56 ± 0.27	0.17 ± 0.10	0.51 ± 0.20	0.51 ± 0.17	0.47 ± 0.24
K^{40}	3.56 ± 0.50	5.56 ± 0.43	4.89 ± 0.57	5.21 ± 0.38	5.36 ± 0.59
Mn^{54}	< 0.009	< 0.010	< 0.019	< 0.012	< 0.012
Fe^{59}	< 0.025	< 0.029	< 0.052	< 0.029	< 0.024
Co^{58}	< 0.012	< 0.007	< 0.011	< 0.008	< 0.015
Co^{60}	< 0.008	< 0.011	< 0.020	< 0.013	< 0.015
Zn^{65}	< 0.027	< 0.016	< 0.027	< 0.022	< 0.051
Nb^{95}	< 0.011	< 0.009	< 0.019	< 0.013	< 0.018
Zr^{95}	< 0.043	< 0.031	< 0.047	< 0.021	< 0.039
I^{131}	< 0.025	< 0.016	< 0.027	< 0.016	< 0.028
Cs^{134}	< 0.015	< 0.009	< 0.015	< 0.008	< 0.017
Cs^{137}	< 0.011	< 0.009	< 0.026	< 0.013	< 0.019
Ba^{140}	< 0.054	< 0.049	< 0.091	< 0.063	< 0.068
La^{140}	< 0.021	< 0.010	< 0.014	< 0.008	< 0.022
Ce^{144}	< 0.089	< 0.076	< 0.131	< 0.127	< 0.118

Date Collected	03 Jul 01	18 Jul 01	01 Aug 01	15 Aug 01	29 Aug 01
Be^7	< 0.21	0.49 ± 0.12	2.69 ± 0.30	1.07 ± 0.26	1.41 ± 0.23
K^{40}	6.04 ± 0.75	5.28 ± 0.38	7.67 ± 0.58	8.19 ± 0.66	4.91 ± 0.50
Mn^{54}	< 0.020	< 0.012	< 0.018	< 0.017	< 0.016
Fe^{59}	< 0.027	< 0.017	< 0.035	< 0.029	< 0.014
Co^{58}	< 0.018	< 0.015	< 0.014	< 0.014	< 0.017
Co^{60}	< 0.015	< 0.015	< 0.011	< 0.021	< 0.021
Zn^{65}	< 0.049	< 0.030	< 0.029	< 0.026	< 0.045
Nb^{95}	< 0.024	< 0.011	< 0.016	< 0.020	< 0.011
Zr^{95}	< 0.041	< 0.027	< 0.019	< 0.043	< 0.024
I^{131}	< 0.022	< 0.022	< 0.027	< 0.031	< 0.027
Cs^{134}	< 0.025	< 0.016	< 0.014	< 0.021	< 0.014
Cs^{137}	< 0.027	< 0.010	< 0.019	< 0.020	< 0.021
Ba^{140}	< 0.089	< 0.041	< 0.085	< 0.062	< 0.061
La^{140}	< 0.016	< 0.015	< 0.011	< 0.008	< 0.007
Ce^{144}	< 0.185	< 0.065	< 0.120	< 0.134	< 0.130

TABLE 17 (continued)

Date Collected	12 Sep 01	26 Sep 01	11 Oct 01	24 Oct 01
Be^{7}	0.97 ± 0.26	0.96 ± 0.16	0.79 ± 0.16	1.48 ± 0.25
K^{40}	4.74 ± 0.60	7.08 ± 0.52	4.13 ± 0.48	6.08 ± 0.49
Mn^{54}	< 0.022	< 0.012	< 0.011	< 0.012
Fe^{59}	< 0.023	< 0.016	< 0.041	< 0.040
Co^{58}	< 0.018	< 0.015	< 0.012	< 0.013
Co^{60}	< 0.026	< 0.014	< 0.015	< 0.032
Zn^{65}	< 0.048	< 0.040	< 0.030	< 0.033
Nb^{95}	< 0.025	< 0.012	< 0.020	< 0.025
Zr^{95}	< 0.060	< 0.034	< 0.029	< 0.038
I^{131}	< 0.034	< 0.024	< 0.014	< 0.023
Cs^{134}	< 0.031	< 0.010	< 0.011	< 0.025
Cs^{137}	< 0.022	< 0.012	< 0.011	< 0.019
Ba^{140}	< 0.107	< 0.064	< 0.082	< 0.057
La^{140}	< 0.012	< 0.012	< 0.013	< 0.015
Ce^{144}	< 0.219	< 0.102	< 0.060	< 0.172

TABLE 18

CL-114 GREEN LEAFY VEGETABLE ACTIVITY (Control)

(pCi/g wet)

Date Collected	27 Jun 01	27 Jun 01	27 Jun 01	25 Jul 01	25 Jul 01	25 Jul 01
Sample Type	Lettuce	Cabbage	Swiss Chard	Cabbage	Kale	Swiss Chard
Gross Beta	5.63 ± 0.16	2.67 ± 0.07	5.63 ± 0.16	2.51 ± 0.03	4.18 ± 0.08	4.20 ± 0.09
Be^{7}	< 0.24	< 0.05	< 0.13	< 0.08	< 0.11	< 0.20
K^{40}	5.56 ± 0.66	2.53 ± 0.23	6.40 ± 0.42	3.08 ± 0.23	3.84 ± 0.36	3.54 ± 0.44
Mn^{54}	< 0.023	< 0.007	< 0.009	< 0.007	< 0.010	< 0.022
Fe^{59}	< 0.050	< 0.009	< 0.031	< 0.017	< 0.019	< 0.029
Co^{58}	< 0.015	< 0.006	< 0.016	< 0.007	< 0.012	< 0.011
Co^{60}	< 0.017	< 0.005	< 0.009	< 0.005	< 0.016	< 0.017
Zn^{65}	< 0.027	< 0.005	< 0.018	< 0.021	< 0.012	< 0.033
Nb^{95}	< 0.018	< 0.007	< 0.014	< 0.008	< 0.007	< 0.020
Zr^{95}	< 0.024	< 0.006	< 0.030	< 0.020	< 0.023	< 0.027
I^{131}	< 0.034	< 0.010	< 0.021	< 0.009	< 0.016	< 0.017
Cs^{134}	< 0.013	< 0.003	< 0.014	< 0.006	< 0.009	< 0.012
Cs^{137}	< 0.028	< 0.004	< 0.020	< 0.007	< 0.011	< 0.018
Ba^{140}	< 0.110	< 0.030	< 0.074	< 0.036	< 0.056	< 0.071
La^{140}	< 0.019	< 0.003	< 0.008	< 0.010	< 0.006	< 0.015
Ce^{144}	< 0.165	< 0.039	< 0.121	< 0.023	< 0.089	< 0.135

Date Collected	29 Aug 01	29 Aug 01	29 Aug 01	26 Sep 01	26 Sep 01	26 Sep 01
Sample Type	Cabbage	Kale	Swiss Chard	Cabbage	Kale	Swiss Chard
Gross Beta	2.91 ± 0.06	4.42 ± 0.09	4.58 ± 0.10	2.38 ± 0.07	4.26 ± 0.12	6.55 ± 0.19
Be^{7}	< 0.11	0.31 ± 0.14	0.29 ± 0.09	0.38 ± 0.16	0.32 ± 0.17	0.16 ± 0.07
K^{40}	2.55 ± 0.37	3.13 ± 0.30	3.50 ± 0.31	3.03 ± 0.46	3.75 ± 0.55	5.61 ± 0.32
Mn^{54}	< 0.008	< 0.009	< 0.007	< 0.013	< 0.027	< 0.008
Fe^{59}	< 0.014	< 0.021	< 0.012	< 0.024	< 0.055	< 0.010
Co^{58}	< 0.005	< 0.007	< 0.006	< 0.009	< 0.016	< 0.006
Co^{60}	< 0.012	< 0.007	< 0.009	< 0.024	< 0.015	< 0.006
Zn^{65}	< 0.025	< 0.010	< 0.020	< 0.037	< 0.046	< 0.011
Nb^{95}	< 0.013	< 0.009	< 0.007	< 0.014	< 0.022	< 0.007
Zr^{95}	< 0.017	< 0.023	< 0.016	< 0.032	< 0.036	< 0.013
I^{131}	< 0.013	< 0.014	< 0.014	< 0.018	< 0.034	< 0.014
Cs^{134}	< 0.010	< 0.007	< 0.008	< 0.016	< 0.024	< 0.010
Cs^{137}	< 0.006	< 0.006	< 0.008	< 0.008	< 0.023	< 0.010
Ba^{140}	< 0.040	< 0.034	< 0.045	< 0.062	< 0.110	< 0.039
La^{140}	< 0.013	< 0.007	< 0.004	< 0.013	< 0.021	< 0.008
Ce^{144}	< 0.038	< 0.065	< 0.071	< 0.067	< 0.078	< 0.047

TABLE 19

CL-115 GREEN LEAFY VEGETABLE ACTIVITY

(pCi/g wet)

Date Collected	27 Jun 01	27 Jun 01	27 Jun 01	25 Jul 01	25 Jul 01	25 Jul 01
Sample Type	Lettuce	Collards	Swiss Chard	Cabbage	Lettuce	Swiss Chard
Gross Beta	3.78 ± 0.13	4.68 ± 0.16	6.46 ± 0.20	2.35 ± 0.05	3.67 ± 0.09	5.89 ± 0.13
Be^{7}	< 0.17	< 0.17	< 0.12	< 0.16	< 0.42	< 0.17
K^{40}	3.84 ± 0.62	3.95 ± 0.41	6.05 ± 0.45	1.73 ± 0.44	3.62 ± 0.84	6.13 ± 0.51
Mn^{54}	< 0.017	< 0.013	< 0.017	< 0.013	< 0.043	< 0.016
Fe^{59}	< 0.051	< 0.020	< 0.022	< 0.024	< 0.044	< 0.041
Co^{58}	< 0.016	< 0.008	< 0.010	< 0.014	< 0.041	< 0.012
Co^{60}	< 0.020	< 0.013	< 0.013	< 0.009	< 0.029	< 0.020
Zn^{65}	< 0.052	< 0.016	< 0.026	< 0.020	< 0.064	< 0.040
Nb^{95}	< 0.012	< 0.011	< 0.013	< 0.015	< 0.037	< 0.019
Zr^{95}	< 0.013	< 0.031	< 0.021	< 0.029	< 0.065	< 0.031
I^{131}	< 0.026	< 0.022	< 0.014	< 0.017	< 0.047	< 0.022
Cs^{134}	< 0.011	< 0.016	< 0.013	< 0.011	< 0.031	< 0.015
Cs^{137}	< 0.016	< 0.015	< 0.013	< 0.015	< 0.028	< 0.020
Ba^{140}	< 0.091	< 0.069	< 0.042	< 0.062	< 0.127	< 0.070
La^{140}	< 0.028	< 0.012	< 0.006	< 0.016	< 0.057	< 0.018
Ce^{144}	< 0.103	< 0.101	< 0.066	< 0.064	< 0.179	< 0.064

Date Collected	29 Aug 01	29 Aug 01	29 Aug 01	26 Sep 01	26 Sep 01	26 Sep 01
Sample Type	Cabbage	Kale	Swiss Chard	Cabbage	Mustard Greens	Kale
Gross Beta	2.93 ± 0.06	4.67 ± 0.10	5.66 ± 0.16	3.39 ± 0.07	3.80 ± 0.13	5.25 ± 0.16
Be^{7}	< 0.11	< 0.17	0.22 ± 0.12	< 0.14	< 0.22	< 0.34
K^{40}	2.10 ± 0.30	4.11 ± 0.50	5.07 ± 0.54	2.19 ± 0.30	3.81 ± 0.58	4.88 ± 0.88
Mn^{54}	< 0.012	< 0.015	< 0.012	< 0.015	< 0.024	< 0.028
Fe^{59}	< 0.022	< 0.015	< 0.014	< 0.030	< 0.035	< 0.040
Co^{58}	< 0.011	< 0.011	< 0.010	< 0.016	< 0.023	< 0.027
Co^{60}	< 0.010	< 0.012	< 0.013	< 0.010	< 0.025	< 0.027
Zn^{65}	< 0.022	< 0.013	< 0.032	< 0.017	< 0.037	< 0.058
Nb^{95}	< 0.010	< 0.017	< 0.010	< 0.015	< 0.026	< 0.031
Zr^{95}	< 0.016	< 0.015	< 0.011	< 0.028	< 0.039	< 0.029
I^{131}	< 0.016	< 0.015	< 0.015	< 0.018	< 0.038	< 0.050
Cs^{134}	< 0.009	< 0.018	< 0.015	< 0.016	< 0.016	< 0.020
Cs^{137}	< 0.014	< 0.007	< 0.011	< 0.015	< 0.026	< 0.013
Ba^{140}	< 0.045	< 0.062	< 0.028	< 0.073	< 0.110	< 0.142
La^{140}	< 0.008	< 0.012	< 0.008	< 0.009	< 0.022	< 0.030
Ce^{144}	< 0.088	< 0.059	< 0.058	< 0.074	< 0.107	< 0.109

TABLE 20

CL-117 GREEN LEAFY VEGETABLE ACTIVITY

(pCi/g wet)

Date Collected	27 Jun 01	27 Jun 01	27 Jun 01	25 Jul 01	25 Jul 01	25 Jul 01
Sample Type	Lettuce	Cabbage	Swiss Chard	Cabbage	Lettuce	Swiss Chard
Gross Beta	3.75 ± 0.12	4.44 ± 0.16	9.06 ± 0.29	2.22 ± 0.04	6.56 ± 0.13	4.70 ± 0.09
Be^{7}	< 0.20	< 0.10	< 0.22	< 0.07	< 0.17	0.26 ± 0.14
K^{40}	3.47 ± 0.52	4.44 ± 0.40	6.90 ± 0.70	2.27 ± 0.29	6.51 ± 0.66	5.98 ± 0.39
Mn^{54}	< 0.020	< 0.015	< 0.020	< 0.006	< 0.020	< 0.013
Fe^{59}	< 0.028	< 0.028	< 0.054	< 0.025	< 0.027	< 0.026
Co^{58}	< 0.015	< 0.009	< 0.020	< 0.010	< 0.019	< 0.010
Co^{60}	< 0.015	< 0.012	< 0.026	< 0.005	< 0.014	< 0.067
Zn^{65}	< 0.020	< 0.012	< 0.036	< 0.019	< 0.046	< 0.025
Nb^{95}	< 0.017	< 0.009	< 0.028	< 0.010	< 0.022	< 0.006
Zr^{95}	< 0.014	< 0.017	< 0.034	< 0.010	< 0.034	< 0.011
I^{131}	< 0.018	< 0.021	< 0.028	< 0.014	< 0.036	< 0.018
Cs^{134}	< 0.015	< 0.010	< 0.015	< 0.006	< 0.022	< 0.011
Cs^{137}	< 0.014	< 0.007	< 0.027	< 0.011	< 0.024	< 0.014
Ba^{140}	< 0.092	< 0.053	< 0.119	< 0.038	< 0.070	< 0.060
La^{140}	< 0.014	< 0.007	< 0.018	< 0.008	< 0.018	< 0.006
Ce^{144}	< 0.122	< 0.095	< 0.138	< 0.036	< 0.142	< 0.091

Date Collected	29 Aug 01	29 Aug 01	29 Aug 01	26 Sep 01	26 Sep 01	26 Sep 01
Sample Type	Cabbage	Kale	Swiss Chard	Kale	Turnip Greens	Swiss Chard
Gross Beta	5.03 ± 0.13	3.37 ± 0.08	5.58 ± 0.11	3.61 ± 0.11	6.51 ± 0.20	5.89 ± 0.17
Be^{7}	0.26 ± 0.15	< 0.22	0.41 ± 0.23	0.55 ± 0.31	0.50 ± 0.18	0.16 ± 0.12
K^{40}	4.39 ± 0.54	3.46 ± 0.49	4.92 ± 0.56	3.24 ± 0.58	5.66 ± 0.46	5.11 ± 0.39
Mn^{54}	< 0.022	< 0.017	< 0.013	< 0.017	< 0.014	< 0.007
Fe^{59}	< 0.044	< 0.040	< 0.050	< 0.056	< 0.027	< 0.026
Co^{58}	< 0.018	< 0.016	< 0.017	< 0.020	< 0.009	< 0.012
Co^{60}	< 0.023	< 0.018	< 0.017	< 0.025	< 0.009	< 0.010
Zn^{65}	< 0.046	< 0.020	< 0.042	< 0.040	< 0.028	< 0.015
Nb^{95}	< 0.015	< 0.020	< 0.017	< 0.018	< 0.008	< 0.011
Zr^{95}	< 0.021	< 0.022	< 0.015	< 0.052	< 0.030	< 0.018
I^{131}	< 0.038	< 0.035	< 0.026	< 0.038	< 0.012	< 0.020
Cs^{134}	< 0.016	< 0.026	< 0.016	< 0.025	< 0.016	< 0.008
Cs^{137}	< 0.022	< 0.019	< 0.013	< 0.020	< 0.017	< 0.009
Ba^{140}	< 0.111	< 0.107	< 0.079	< 0.115	< 0.078	< 0.058
La^{140}	< 0.024	< 0.011	< 0.014	< 0.031	< 0.010	< 0.006
Ce^{144}	< 0.142	< 0.122	< 0.159	< 0.227	< 0.118	< 0.076

TABLE 21

CL-118 GREEN LEAFY VEGETABLE ACTIVITY

(pCi/g wet)

Date Collected	27 Jun 01	27 Jun 01	27 Jun 01	25 Jul 01	25 Jul 01	25 Jul 01
Sample Type	Collards	Kale	Turnip Greens	Cabbage	Turnip Greens	Kale
Gross Beta	5.93 ± 0.18	5.35 ± 0.17	4.94 ± 0.16	2.87 ± 0.06	4.64 ± 0.11	4.47 ± 0.10
Be^{7}	< 0.10	< 0.18	< 0.09	< 0.10	0.57 ± 0.23	< 0.17
K^{40}	5.89 ± 0.43	5.15 ± 0.73	3.87 ± 0.35	2.48 ± 0.37	4.50 ± 0.58	5.01 ± 0.71
Mn^{54}	< 0.008	< 0.021	< 0.009	< 0.008	< 0.015	< 0.021
Fe^{59}	< 0.027	< 0.031	< 0.020	< 0.015	< 0.023	< 0.038
Co^{58}	< 0.007	< 0.025	< 0.008	< 0.012	< 0.016	< 0.022
Co^{60}	< 0.009	< 0.019	< 0.007	< 0.010	< 0.012	< 0.011
Zn^{65}	< 0.013	< 0.031	< 0.013	< 0.030	< 0.033	< 0.062
Nb^{95}	< 0.011	< 0.024	< 0.011	< 0.013	< 0.021	< 0.025
Zr^{95}	< 0.014	< 0.024	< 0.015	< 0.019	< 0.041	< 0.039
I^{131}	< 0.014	< 0.035	< 0.017	< 0.012	< 0.022	< 0.021
Cs^{134}	< 0.006	< 0.016	< 0.006	< 0.009	< 0.011	< 0.026
Cs^{137}	< 0.011	< 0.026	< 0.011	< 0.007	< 0.017	< 0.015
Ba^{140}	< 0.052	< 0.138	< 0.038	< 0.048	< 0.075	< 0.090
La^{140}	< 0.005	< 0.031	< 0.005	< 0.016	< 0.017	< 0.021
Ce^{144}	< 0.057	< 0.081	< 0.038	< 0.066	< 0.073	< 0.080

Date Collected	29 Aug 01	29 Aug 01	29 Aug 01	26 Sep 01	26 Sep 01	26 Sep 01
Sample Type	Cabbage	Golden Cross	Turnip Greens	Cabbage	Collard Greens	Turnip Greens
Gross Beta	3.43 ± 0.07	4.20 ± 0.14	3.20 ± 0.14	4.33 ± 0.13	7.25 ± 0.21	6.23 ± 0.17
Be^{7}	< 0.085	< 0.17	0.37 ± 0.20	< 0.12	0.68 ± 0.34	< 0.34
K^{40}	1.92 ± 0.28	4.24 ± 0.63	4.55 ± 0.56	2.80 ± 0.32	5.46 ± 0.81	4.40 ± 0.84
Mn^{54}	< 0.008	< 0.026	< 0.014	< 0.010	< 0.020	< 0.036
Fe^{59}	< 0.011	< 0.025	< 0.026	< 0.018	< 0.063	< 0.030
Co^{58}	< 0.013	< 0.018	< 0.013	< 0.005	< 0.027	< 0.015
Co^{60}	< 0.008	< 0.019	< 0.015	< 0.010	< 0.052	< 0.014
Zn^{65}	< 0.015	< 0.029	< 0.015	< 0.018	< 0.031	< 0.077
Nb^{95}	< 0.008	< 0.027	< 0.016	< 0.009	< 0.038	< 0.032
Zr^{95}	< 0.015	< 0.050	< 0.008	< 0.011	< 0.053	< 0.083
I^{131}	< 0.013	< 0.030	< 0.020	< 0.011	< 0.049	< 0.046
Cs^{134}	< 0.012	< 0.022	< 0.017	< 0.013	< 0.034	< 0.041
Cs^{137}	< 0.005	< 0.026	< 0.011	< 0.008	< 0.032	< 0.035
Ba^{140}	< 0.027	< 0.122	< 0.076	< 0.036	< 0.093	< 0.129
La^{140}	< 0.006	< 0.018	< 0.009	< 0.006	< 0.026	< 0.021
Ce^{144}	< 0.041	< 0.111	< 0.113	< 0.074	< 0.210	< 0.131

TABLE 22

CL-19 FISH ACTIVITY

(pCi/g wet)

Date Collected	19 Apr 01	19 Apr 01	19 Apr 01	19 Apr 01
Type	Bluegill	Bass	Carp	Crappie
Be^{7}	< 0.10	< 0.15	< 0.16	< 0.011
K^{40}	2.70 ± 0.40	3.22 ± 0.40	3.06 ± 0.43	2.92 ± 0.34
Mn^{54}	< 0.011	< 0.014	< 0.011	< 0.011
Fe^{59}	< 0.033	< 0.021	< 0.043	< 0.027
Co^{58}	< 0.012	< 0.017	< 0.015	< 0.014
Co^{60}	< 0.009	< 0.009	< 0.012	< 0.010
Zn^{65}	< 0.023	< 0.035	< 0.015	< 0.024
Nb^{95}	< 0.013	< 0.018	< 0.031	< 0.018
Zr^{95}	< 0.027	< 0.027	< 0.046	< 0.025
Cs^{134}	< 0.012	< 0.013	< 0.011	< 0.011
Cs^{137}	< 0.013	< 0.015	< 0.012	< 0.013
Ba^{140}	< 0.130	< 0.121	< 0.313	< 0.317
La^{140}	< 0.026	< 0.034	< 0.040	< 0.033
Ce^{144}	< 0.026	< 0.041	< 0.056	< 0.095

Date Collected	04 Oct 01	04 Oct 01	04 Oct 01	04 Oct 01
Type	Bass	Bluegill	White Bass	Carp
Be^{7}	< 0.15	< 0.18	< 0.13	< 0.16
K^{40}	2.74 ± 0.48	2.23 ± 0.62	2.66 ± 0.35	2.46 ± 0.39
Mn^{54}	< 0.016	< 0.016	< 0.007	< 0.012
Fe^{59}	< 0.034	< 0.040	< 0.017	< 0.046
Co^{58}	< 0.018	< 0.025	< 0.014	< 0.012
Co^{60}	< 0.023	< 0.020	< 0.009	< 0.011
Zn^{65}	< 0.018	< 0.025	< 0.023	< 0.020
Nb^{95}	< 0.033	< 0.027	< 0.019	< 0.022
Zr^{95}	< 0.048	< 0.062	< 0.028	< 0.027
Cs^{134}	< 0.023	< 0.025	< 0.014	< 0.013
Cs^{137}	< 0.017	< 0.012	< 0.012	< 0.009
Ba^{140}	< 0.269	< 0.258	< 0.120	< 0.152
La^{140}	< 0.063	< 0.046	< 0.042	< 0.042
Ce^{144}	< 0.141	< 0.161	< 0.032	< 0.039

TABLE 23

CL-105 FISH ACTIVITY (Control)

(pCi/g wet)

Date Collected	19 Apr 01	19 Apr 01	19 Apr 01	19 Apr 01
Type	Bluegill	Bass	Carp	Crappie
Be^{7}	< 0.10	< 0.15	< 0.12	< 0.55
K^{40}	2.40 ± 0.28	2.97 ± 0.36	2.82 ± 0.39	3.38 ± 0.76
Mn^{54}	< 0.006	< 0.014	< 0.014	< 0.051
Fe^{59}	< 0.027	< 0.028	< 0.022	< 0.123
Co^{58}	< 0.010	< 0.009	< 0.018	< 0.062
Co^{60}	< 0.008	< 0.008	< 0.009	< 0.029
Zn^{65}	< 0.018	< 0.021	< 0.017	< 0.075
Nb^{95}	< 0.010	< 0.018	< 0.020	< 0.084
Zr^{95}	< 0.028	< 0.022	< 0.036	< 0.078
Cs^{134}	< 0.011	< 0.015	< 0.010	< 0.051
Cs^{137}	< 0.011	< 0.010	< 0.011	< 0.029
Ba^{140}	< 0.133	< 0.201	< 0.225	< 0.148
La^{140}	< 0.026	< 0.042	< 0.059	< 0.348
Ce^{144}	< 0.054	< 0.075	< 0.044	< 0.189

Date Collected	04 Oct 01	04 Oct 01	04 Oct 01	04 Oct 01
Type	Bass	Bluegill	Crappie	Carp
Be^{7}	< 0.13	< 0.20	< 0.16	< 0.11
K^{40}	2.95 ± 0.43	2.17 ± 0.54	2.17 ± 0.51	2.25 ± 0.26
Mn^{54}	< 0.011	< 0.023	< 0.017	< 0.010
Fe^{59}	< 0.024	< 0.040	< 0.042	< 0.027
Co^{58}	< 0.008	< 0.016	< 0.021	< 0.009
Co^{60}	< 0.010	< 0.022	< 0.017	< 0.012
Zn^{65}	< 0.013	< 0.046	< 0.031	< 0.022
Nb^{95}	< 0.017	< 0.029	< 0.025	< 0.010
Zr^{95}	< 0.021	< 0.072	< 0.031	< 0.022
Cs^{134}	< 0.008	< 0.022	< 0.011	< 0.008
Cs^{137}	< 0.014	< 0.021	< 0.007	< 0.008
Ba^{140}	< 0.230	< 0.323	< 0.295	< 0.077
La^{140}	< 0.053	< 0.045	< 0.113	< 0.023
Ce^{144}	< 0.054	< 0.143	< 0.077	< 0.042

TABLE 24

SHORELINE SEDIMENT ACTIVITY

(pCi/g dry)

Location Date Collected	CL-7B 19 Apr 01	CL-7B 04 Oct 01	CL-105 19 Apr 01	CL-105 04 Oct 01
Gross Alpha	< 3.5	3.0 ± 1.3	< 3.1	1.4 ± 1.0
Gross Beta	5.5 ± 2.3	12.1 ± 1.3	12.9 ± 2.4	8.7 ± 1.2
Sr^{90}	< 0.027	< 0.017	0.11 ± 0.023	< 0.017
Be^{7}	< 0.17	< 0.30	< 0.24	< 0.22
K^{40}	7.85 ± 0.63	8.55 ± 0.73	8.81 ± 0.70	7.12 ± 0.65
Mn^{54}	< 0.018	< 0.011	< 0.012	< 0.020
Fe^{59}	< 0.069	< 0.010	< 0.034	< 0.070
Co^{58}	< 0.026	< 0.033	< 0.021	< 0.027
Co^{60}	< 0.015	< 0.022	< 0.017	< 0.015
Zn^{65}	< 0.065	< 0.056	< 0.055	< 0.065
Nb^{95}	< 0.034	< 0.055	< 0.036	< 0.037
Zr^{95}	< 0.035	< 0.055	< 0.045	< 0.049
Cs^{134}	< 0.026	< 0.032	< 0.028	< 0.024
Cs^{137}	< 0.014	< 0.018	< 0.015	< 0.018
Ba^{140}	< 0.269	< 0.648	< 0.440	< 0.985
La^{140}	< 0.104	< 0.167	< 0.070	< 0.116
Ce^{144}	< 0.056	< 0.137	< 0.057	< 0.068