Surveillance2010

Vermont Yankee Nuclear Power Station

Report on Public Health Monitoring
December 2011

VERMONT
DEPARTMENT OF HEALTH
Agency of Human Services

108 Cherry Street, PO Box 70
Burlington, VT 05402

healthvermont.gov

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Executive Summary

The Vermont Department of Health has been monitoring and reporting on radiation emissions and radiological effluents (discharges) from the Vermont Yankee Nuclear Power Station since 1971. The purpose of this environmental surveillance is to assure that the public's health is protected from excess amounts of radiation. We do this by taking environmental measurements at various locations throughout the year, and comparing these to background radiation, past measurements and state regulatory limits.

This *2010 Surveillance Report* details more than 3,200 separate measurements of more than 1,600 samples of air, water, milk, soil, vegetation, sediment and fish taken during the year at the Vermont Yankee site boundary (property line), on-site at Vermont Yankee, from the Connecticut River, and from the towns surrounding the station.

The Vermont Department of Health enforces the state's Radiological Health Rule, which limits the amount of ionizing radiation that a member of the public could be exposed to if standing at the site boundary of the station. The Rule also limits the amount of gaseous, liquid, radioiodine and radioactive particulate effluents that a member of the public could possibly be exposed to as a result of operations at Vermont Yankee.

The Rule specifically limits the annual direct gamma radiation from Vermont Yankee to a measured exposure value of 20 milliroentgen above background radiation at the site boundary on land. This measured exposure value represents a 5 millirem effective dose equivalent to any member of the general public. The Rule also limits specific emissions or discharges from Vermont Yankee to an effective dose of no more than 5 millirem from each pathway to any member of the general public.

The Connecticut River site boundary around Vermont Yankee is regulated by the U.S. Nuclear Regulatory Commission, which limits the annual direct gamma radiation to any member of the general public at this boundary to 100 millirem.

2010 Surveillance Results:

- Measurements in this report confirm no dose in excess of any limit established by the Vermont Department of Health's Radiological Health Rule.

- The numerous samples and measurements of the environment on-site and around Vermont Yankee in 2010 show that there were no instances of non-compliance with the Radiological Health Rule from either operations at Vermont Yankee or the tritium-contaminated plume of groundwater first reported in January 2010. (See the following summary of the investigation into tritium contamination.)

- The Health Department's continuing analysis of cancer statistics for people who live in the communities surrounding Vermont Yankee shows that cancer incidence and mortality do not differ significantly from people in the rest of Windham County, elsewhere in Vermont, or the U.S. as a whole.

Investigation into Tritium Contamination

On January 7, 2010, Vermont Yankee officials notified the Health Department that a sample taken in November 2009 from a groundwater monitoring well on its property contained tritium. This finding signaled an unintended release of radioactive material, and it meant that other radioactive materials may have contaminated the environment. The Health Department organized a team of state health and environmental experts from multiple agencies to independently monitor, test, and report on the investigation into the source of the leak, the possible risks to the public associated with the leak, and remediation actions. The 2010 test results are presented in this report. Results of this investigation have been reported since January 2010 on the Health Department's website: http://healthvermont.gov/enviro/rad/yankee/tritium.aspx.

Strontium-90 in Fish

The Health Department tests and reports on fish from two locations in the Connecticut River. Results for 2010 are similar to those previously reported. Fish had measurable amounts of potassium-40, a naturally-occurring radioactive material, strontium-90 and cesium-137, both human-made radioactive materials. Levels of cesium-137 detected are within the historical range for Vermont of below the lower limit of detection to 100 picocuries per kilogram (pCi/kg). No historical range has been established for strontium-90 in Vermont fish. However, one finding was notable: strontium-90 was detected just above the lower limit of detection in the edible portion of one fish sample collected in June. This was the first time that strontium-90 has been detected in the edible portion of any of the fish samples. While the scientific literature includes evidence that edible portions of fish can retain (bioaccumulate) strontium-90 over time, this finding in the Connecticut River requires more sample data to better understand what it means. The levels of radioactive materials measured in these fish do not pose a health risk. The 2010 test results are presented in this report, and have been reported to date on the Health Department's website: http://healthvermont.gov/enviro/rad/yankee/tritium.aspx

Fukushima Nuclear Power Station

In March 2011, a strong earthquake and tsunami occurred off the coast of Japan. These events caused extensive structural and electrical damage throughout Japan, including at the Fukushima Nuclear Power Station. Multiple failures resulted in nuclear meltdowns at multiple reactors and caused the release of radioactive material into the air and water. The Health Department conducted more frequent environmental sampling during April through June 2011. Trace amounts of cesium-137 and iodine-131 were detected in samples taken in Vermont. These results were expected following the events in Japan. There is no health risk to Vermonters. These test results will be presented in the 2011 surveillance report, and are reported on the Health Department's website: http://www.healthvermont.gov/enviro/rad/japan2011.aspx.

For questions or more information – The information presented in this report is sometimes complex. We invite interested readers to contact the Health Department's Radiological and Toxicological Sciences program at 802-863-7730 with any questions. The Health Department's Radiological Health Rule is online at: http://www.healthvermont.gov/regs/documents/radio_health_amended_rule.pdf

Introduction

This *2010 Surveillance Report* describes the amount and types of radiation found on and near the Vermont Yankee Nuclear Power Station. As a working nuclear power station, Vermont Yankee generates and emits ionizing radiation in the form of direct gamma radiation, and discharges radioactive materials that emit alpha-, beta- and gamma-radiations. A person may be exposed to radiation released from Vermont Yankee in air or liquid discharges from the station, or from unmonitored releases or leaks.

The Vermont Department of Health enforces the state's Radiological Health Rule, which limits the amount of ionizing radiation that a member of the public could be exposed to if standing at the site boundary (property line) of the station. The Rule also limits the amount of gaseous, liquid, radioiodine and radioactive particulate effluents that a member of the public could possibly be exposed to as a result of operations at Vermont Yankee.

The Rule specifically limits the annual direct gamma radiation from Vermont Yankee to a measured exposure value of 20 milliroentgen above background radiation at the site boundary on land. This measured exposure value represents a 5 millirem effective dose equivalent to any member of the general public. The Rule also limits specific emissions or discharges from Vermont Yankee to an effective dose of no more than 5 millirem from each pathway to any member of the general public.

The Health Department monitors radiation levels at and near Vermont Yankee. Because both naturally occurring and human-made radiation is all around us in the environment, the Health Department also tests other areas of the state to provide background data on types and amounts of environmental radiation. Background values are compared to the types and amounts of radiation found on-site and in areas near Vermont Yankee. The two sets of values are compared to determine if Vermont Yankee's operations are resulting in an increased radiation risk to the public.

This report presents more than 3,200 measurements taken on more than 1,600 samples that were obtained at Vermont Yankee and from the communities surrounding the station during 2010. Air, water, milk, soil, vegetation, fish, and sediment samples were collected. Maps of locations where samples or measurements were taken, as well as the testing procedures, are also provided throughout.

Most samples are tested by the Health Department Laboratory located in Burlington, Vermont. Measurements of direct gamma radiation exposures using thermoluminescent dosimeters (TLDs) are tested by a National Voluntary Laboratory Accreditation Program vendor of dosimetry. Analyses for the hard-to-detect radioactive metals strontium-89, strontium-90, iron-55 and nickel-63 are performed by only a small number of laboratories in the U.S. The Health Department contracted with a qualified laboratory to perform these tests on our environmental samples.

The primary human health concern with chronic low-level exposure to ionizing radiation is the potential to develop cancer. For this reason, the Health Department also presents cancer incidence and cancer mortality data for the area near Vermont Yankee, compared to the same type of data for Vermont as a whole, and for the U.S. population.

Investigation into Tritium Contamination

On January 7, 2010, Vermont Yankee officials notified the Health Department that samples taken in November 2009 from a groundwater monitoring well on the property contained tritium, a form of radioactive hydrogen. This finding signaled an unintended release of radioactive material, and it meant that other radioactive materials may have contaminated the environment. The Health Department organized a team of state health and environmental experts from multiple agencies to independently monitor, test and report on the investigation into the source of the leak, the possible risks to the public associated with the leak, and remediation actions.

To track the leak, Vermont Yankee installed an additional 29 groundwater monitoring wells. Sampling and testing the water from these wells allowed Vermont Yankee staff to identify the sources of the leaks, track the contaminated plume and monitor for other leaks. Two separate leaks, between the Advanced Off-Gas Building and the Turbine Building, were found. One was identified in mid-February, the other in May 2010. Over the course of 2010, the Health Department received split samples from Vermont Yankee to independently test water from the groundwater monitoring wells, and track the movement of the plume of tritium-contaminated groundwater as it traveled to the Connecticut River. Decreasing measurements of tritium in the groundwater wells over time showed that at least these two sources of leaks had been stopped.

Soil closest to the leak points was sampled, tested, excavated and removed from the site. Approximately 310,000 pounds of soil from the excavation was sent to a licensed disposal facility. Several extraction wells were drilled on-site to remove a portion of the contaminated groundwater. In 2010, approximately 309,000 gallons of groundwater were extracted. Most of the water, about 300,000 gallons, was shipped to a licensed disposal facility. The remaining 9,000 gallons were re-used in the station by Vermont Yankee.

During 2010, the Health Department increased both on- and off-site surveillance of ground and surface waters and other sample types to ensure that there was no increased radiation exposure to members of the public. The Health Department has reported on the investigation with extensive information, maps, lab test results, charts and graphics at: http://www.healthvermont.gov/enviro/rad/yankee/tritium.aspx
The 2010 test results are presented in this report.

Results Presented in this Report:

- Direct gamma radiation measured continuously from more than 70 sites
- Air samples tested for radioactive particulates, gases, vapors and radioactive iodine collected by continuous air samplers
- Groundwater, drinking water wells and river water from the Connecticut River near Vermont Yankee tested for tritium, gamma-emitting materials, total alpha radioactivity, total beta radioactivity, and hard-to-detect radioactive metals (iron-55, nickel-63, strontium-89 and strontium-90)
- Milk from local dairy farms, wild and cultivated vegetation, river sediments, fish and off-site soil tested for natural and human-made radioactive materials
- Soil collected from the Advanced Off-Gas leak area tested for natural and human-made radioactive materials

These data show no radiation dose in excess of the Health Department's limits as a result of Vermont Yankee operations in 2010.

The full *Surveillance 2010* report is published at the Vermont Department of Health web site: www.healthvermont.gov. For questions about the content, call the Health Department's Radiological and Toxicological Sciences program at 802-865-7730.

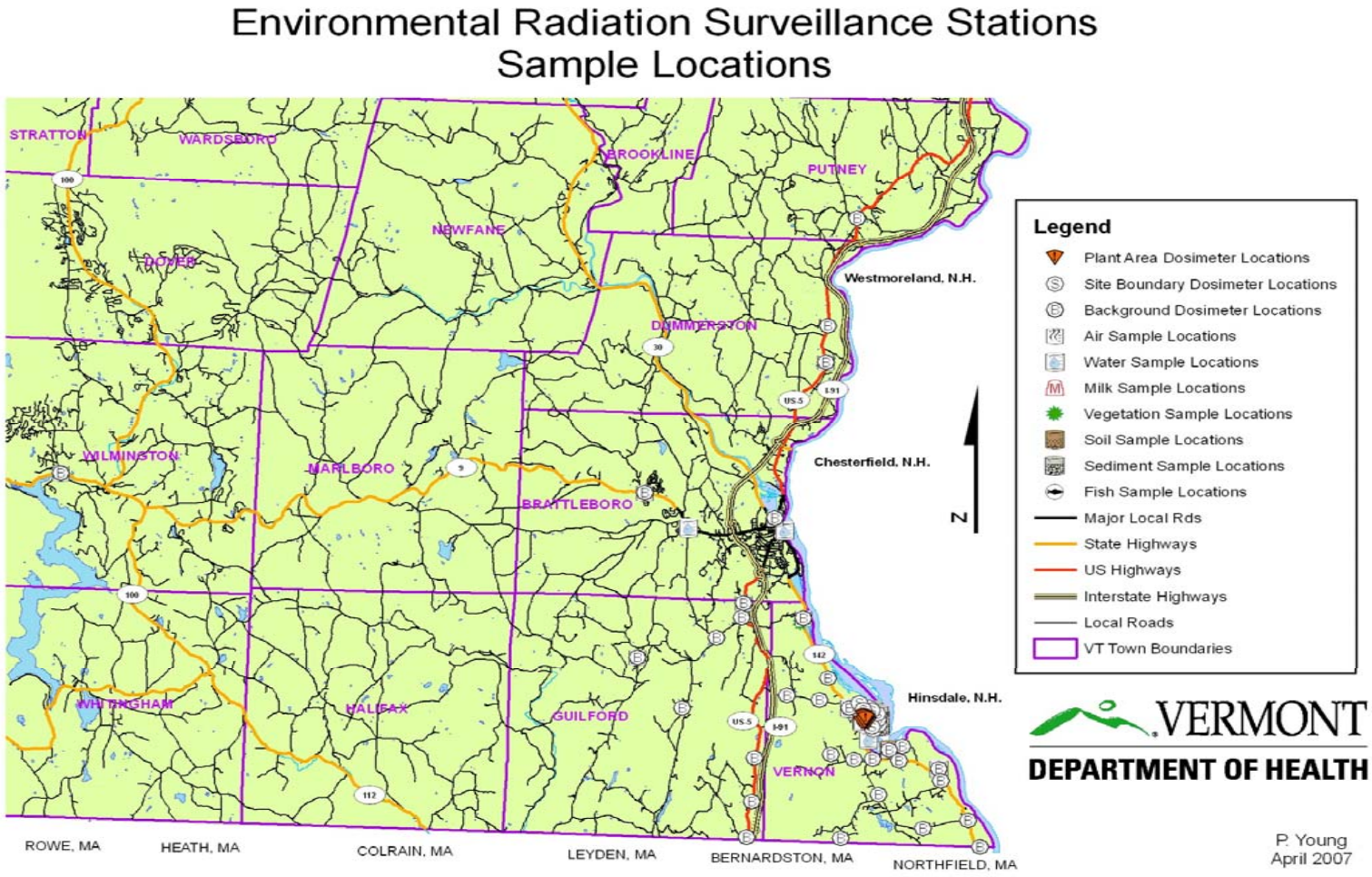
Program Results Summary

An overview of the 2010 sample data is presented in this summary. Detailed descriptions of sample measurement techniques and analyses are presented in further sections of this report. The total number, type of sample collected, type of analysis performed and summary results are reported in Table 1. Routine environmental sampling sites are shown in Maps 1 and 2. Map 1 shows all of the locations where routine samples were taken. Map 2 shows the locations in Vernon where samples were taken. Due to the scale and detail on each map, some maps may be more easily viewed in the online version of this report.

Table 1. 2010 Summary of Samples, Tests and Results

Sample Type	Sites	Number of Tests	Test Type	Results
Direct Gamma Radiation	72	288	Thermoluminescent dosimeters	Less than 20 milliroentgen per year at the site boundary; no single quarter exceeded 10 milliroentgen.
Air: Particulates, Gases and Vapors	9	98	Total Alpha Radioactivity	Alpha radioactivity within the historical range. No increase observed as a result of operations at Vermont Yankee.
		98	Total Beta Radioactivity	Beta radioactivity within the historical range. No increase observed as a result of operations at Vermont Yankee.
		98	Iodine-131	All samples less than the lower limit of detection.
		98	Gamma (gas/vapors) Radioactivity	All detected gamma radioactivity of natural origin.
		4	Gamma (particulates) Radioactivity	All detected gamma radioactivity of natural origin.
Water	10	118	Total Alpha Radioactivity	Alpha radioactivity within the historical range. No increase observed as a result of operations at Vermont Yankee.
		118	Total Beta Radioactivity	Beta radioactivity within the historical range. No increase observed as a result of operations at Vermont Yankee.
	56	1131	Tritium	All off-site, on-site active drinking water, and Connecticut River locations less than the lower limit of detection. 14 on-site groundwater monitoring wells test positive for tritium. Range of well results: 523 to 2,651,000 pCi/L.
		893	Gamma Radioactivity	All detected gamma radioactivity of natural origin.
	53	169	Iron-55, Nickel-63, Strontium-89, Strontium-90	All samples less than the lower limit of detection.
Milk	2	22	Iodine-131	All samples less than the lower limit of detection.
		22	Gamma Radioactivity	All detected gamma radioactivity of natural origin.
Vegetation	7	8	Gamma Radioactivity	All detected gamma radioactivity of natural origin.
Soil (routine)	7	7	Gamma Radioactivity	Off-site soil: all detected gamma radioactivity attributable to natural, Chernobyl or above-ground nuclear weapons testing origin.
Soil (AOG investigation)	13	40	Gamma Radioactivity	Detected gamma-emitting materials indicated a reactor condensate leak on-site.
Sediments	20	38	Gamma Radioactivity	All detected gamma radioactivity attributable to natural, Chernobyl or above-ground nuclear weapons testing origin.
Fish	2	12	Gamma Radioactivity	All detected gamma radioactivity attributable to natural, Chernobyl or above-ground nuclear weapons testing origin.
		15	Iron-55, Nickel-63, Strontium-89	All samples less than the lower limit of detection.
		19	Strontium-90	All detected gamma radioactivity attributable to natural, Chernobyl or above-ground nuclear weapons testing origin.
Sum	**251**	**3296**		

Map 1


Environmental Radiation Surveillance Stations
Sample Locations
STRATTON
WARDSBORO
BROOKLINE
PUTNEY
NEWFANE
DOVER
Westmoreland, N.H.
DUMMERSTON
WILMINGTON
MARLBORO
Chesterfield, N.H.
BRATTLEBORO
N
WHITINGHAM
HALIFAX
GUILFORD
Hinsdale, N.H.
VERNON
ROWE, MA
HEATH, MA
COLRAIN, MA
LEYDEN, MA
BERNARDSTON, MA
NORTHFIELD, MA
Legend
Plant Area Dosimeter Locations
Site Boundary Dosimeter Locations
Background Dosimeter Locations
Air Sample Locations
Water Sample Locations
Milk Sample Locations
Vegetation Sample Locations
Soil Sample Locations
Sediment Sample Locations
Fish Sample Locations
Major Local Rds
State Highways
US Highways
Interstate Highways
Local Roads
VT Town Boundaries
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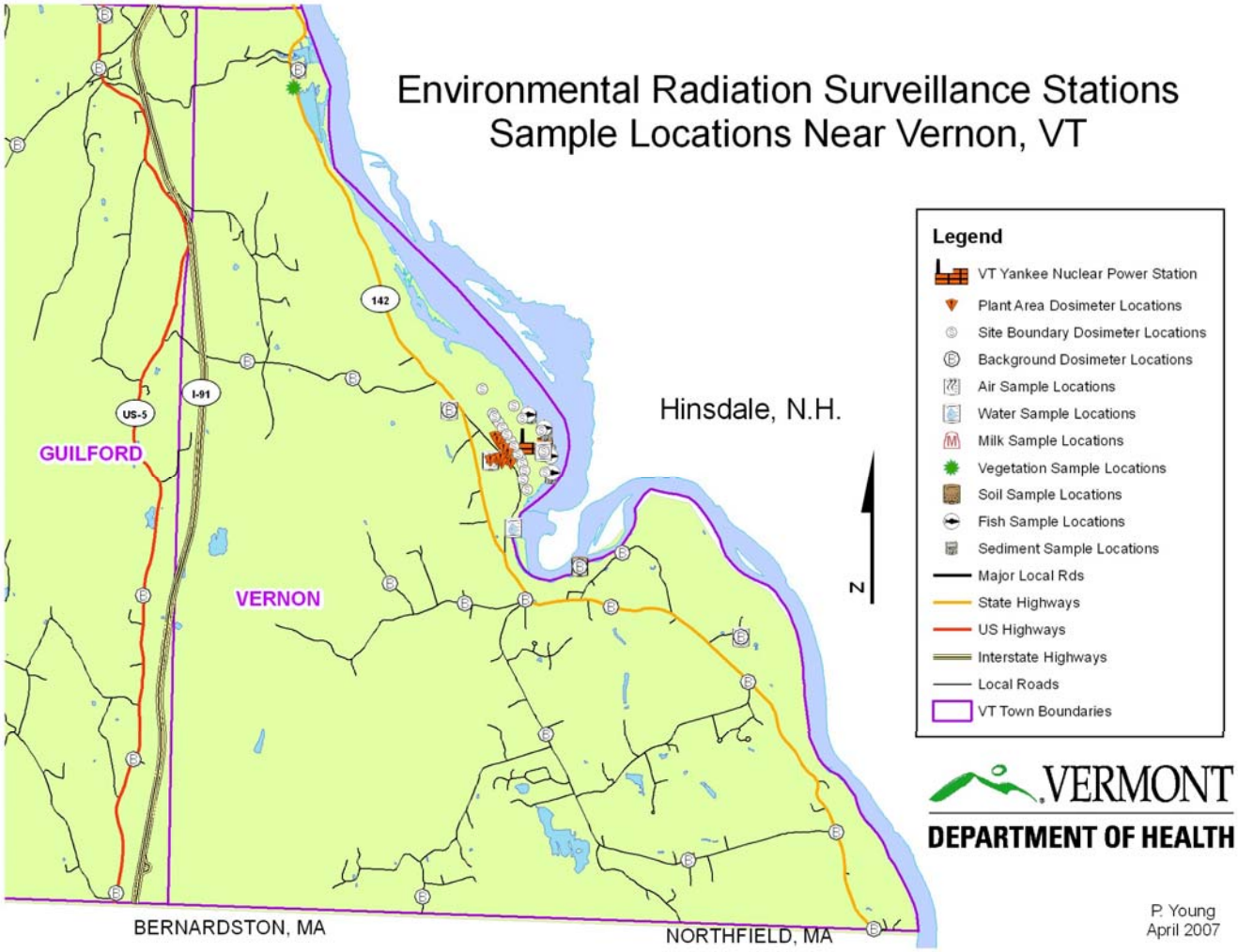
Map 2


Environmental Radiation Surveillance Stations
Sample Locations Near Vernon, VT
Hinsdale, N.H.
GUILFORD
VERNON
BERNARDSTON, MA
NORTHFIELD, MA
142
I-91
US-5
N
Legend
VT Yankee Nuclear Power Station
Plant Area Dosimeter Locations
Site Boundary Dosimeter Locations
Background Dosimeter Locations
Air Sample Locations
Water Sample Locations
Milk Sample Locations
Vegetation Sample Locations
Soil Sample Locations
Fish Sample Locations
Sediment Sample Locations
Major Local Rds
State Highways
US Highways
Interstate Highways
Local Roads
VT Town Boundaries
VERMONT
DEPARTMENT OF HEALTH
P. Young
April 2007

Types of Ionizing Radiation

There are three main types of ionizing radiation that may be released from Vermont Yankee: alpha particles, beta particles and gamma rays. The risk of adverse health effects from ionizing radiation is linked to the type and energy of radiation and the length and method of exposure to the radiation. The Health Department tests for these forms of radiation in many sample types.

Alpha and Beta (particle) Radiation

Alpha and beta radiation are particle forms of radiation energy. Alpha- and beta-charged particles can only travel a short distance and are completely blocked by simple materials.

Alpha radiation is the most biologically hazardous form of ionizing radiation. For the same amount of alpha, beta and gamma radiation energy, the alpha radiation causes about 20 times more tissue damage. It is also the type of radiation that people can most easily shield against. A sheet of paper can stop an alpha particle, and so can the dead layer of skin that covers the outer surface of our bodies. Alpha particles can only cause harm if alpha-emitting materials are inhaled, ingested or otherwise taken into the body. The most common alpha radiation exposure for people is from radon gas in their homes.

Table 2. Examples of Radioactive Elements that Produce Alpha-Radiations

Naturally-occurring alpha emitters	
Uranium-238	Radon-222
Thorium-232	Polonium-210
Radium-226	Bismuth-212
Human-made alpha emitters	
Americium-241	Plutonium-239

Beta radiation is also easily stopped by simple materials like plastics, aluminum and wood. Beta radiations may be able to go through the first few millimeters of human skin. Beta radiation can cause damage to internal tissues and organs if a beta-emitting material is inhaled, ingested or otherwise taken into the body.

Alpha and beta-emitting materials are released from the station's air stack at Vermont Yankee. They may also be emitted in liquid discharges from contaminated reactor systems.

Figure 1. Relative Ability of Ionizing Radiations to go through Materials

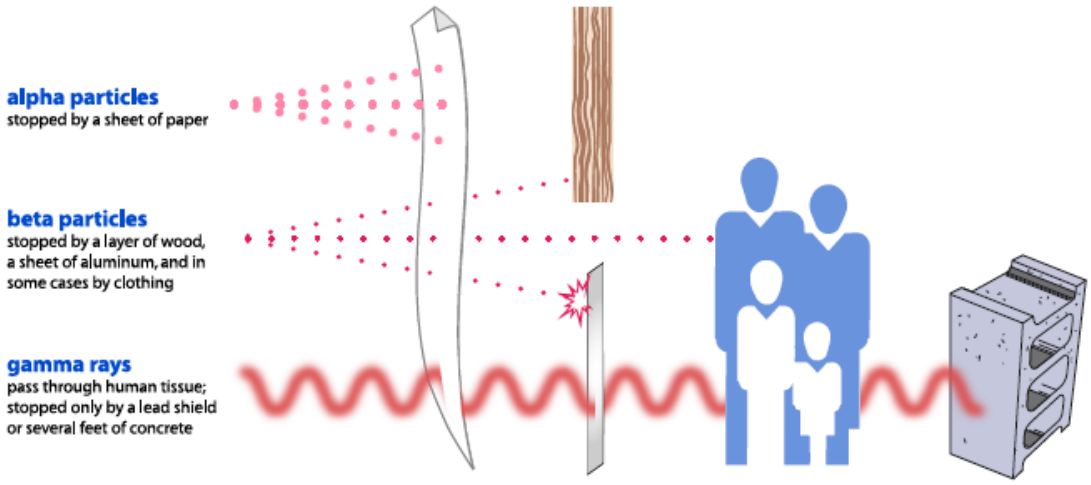


Table 3. Examples of Radioactive Elements that Produce Beta-Radiations

Naturally-occurring beta emitters	
Carbon-14	Potassium-40
Radium-228	Hydrogen-3, "tritium" (also human-made)
Human-made beta emitters	
Iodine-131	Technetium-99
Strontium-90	Hydrogen-3, "tritium" (also naturally-occurring)
Nickel-63	Iron-59

Gamma Radiation

Direct gamma radiation is an electromagnetic wave of energy similar to light, except that it passes through most materials in the form of an energy wave. Gamma radiation can also scatter off of materials. Direct gamma radiation loses strength as it travels away from the source. It is also reduced after large numbers of collisions with electrons in the atom.

Gamma radiation passes through the skin and may pass through the whole body. If gamma radiation passes through the body, it may damage tissues. People can be affected by gamma radiation if they are located in an area where direct gamma radiation exists, or if they ingest a gamma-emitting material.

Direct gamma radiation is emitted from reactor and turbine systems such as those at Vermont Yankee. Gamma-emitting materials may also be released as gases or particles from the station's air stack.

Table 4. Examples of Radioactive Elements that Produce Gamma-Radiations

Naturally-occurring gamma emitters		
Beryllium-7	Potassium-40	Thallium-208
Bismuth-212	Bismuth-214	Lead-210
Lead-212	Lead-214	Polonium-210
Actinium-228	Radium-224	Radium-226
Radium-228	Thorium-228	Thorium-229
Thorium-230	Thorium-231	Thorium-232
Thorium-234	Uranium-233	Uranium-234
Uranium-235	Uranium-238	
Human-made gamma emitters		
Antimony-124	Antimony-126	Barium-140/ Lanthanum-140
Cerium-144/ Promethium-144	Cesium-134	Cesium-136
Cesium-137	Chromium-51	Cobalt-56
Cobalt-58	Cobalt-60	Iodine-131
Iodine-132	Iodine-133	Iodine-135
Krypton-85	Krypton-88	Manganese-54
Neptunium-239	Plutonium-239	Plutonium-240
Ruthenium-103	Strontium-85	Strontium-89
Tellurium-132	Xenon-133	Xenon-133m
Xenon-135	Zinc-65	Zirconium-95/Niobium-95

Ionizing Radiation Risks

The radiations to which people may be exposed as a result of Vermont Yankee operations are ionizing radiations. According to the International Agency for Research on Cancer (IARC), ionizing radiation can cause cancer in humans. The energy released by ionizing radiation may directly or indirectly damage the DNA of human cells and cause cancer. It has been shown that people who are exposed to high doses of ionizing radiation, in excess of 10,000 millirem, have a statistically higher risk of cancer. As with other cancer-causing agents, it is not possible to prove that low doses of ionizing radiation are without risk. At very low doses such as those presented in this report, the risk of developing cancer from chronic exposure to radiation is considered to be very low, if it exists at all.

The risk management approach used for public health protection with ionizing radiation is called the ALARA Principle. The ALARA Principle states that every reasonable effort must be made to maintain radiation exposures ***A**s **L**ow **A**s **R**easonably **A**chievable*. The Health Department's Radiological Health Rule not only requires that exposures to ionizing radiation be less than specific limits, but also that Vermont Yankee and all other radiation users in industry, medicine and education use the ALARA Principle.

For more information about ionizing radiation risk:

- The National Academies of Science: http://books.nap.edu/openbook.php?isbn=030909156X
- The Health Physics Society: http://hps.org/documents/risk_ps010-2.pdf
- The International Agency for Research on Cancer monographs series: http://monographs.iarc.fr/ENG/Monographs/PDFs/index.php

Cancer Prevalence, Incidence & Mortality

The primary health concern with chronic low-level exposure to ionizing radiation is the potential to develop cancer. Starting with the *Surveillance 2006 Report on Public Health Monitoring*, the Vermont Department of Health began presenting cancer-related health outcome data for the population in the area of Vermont Yankee. The Health Department tabulates, analyzes and provides data for cancer incidence (new cancer cases diagnosed) and cancer mortality (people dying from cancer) for Windham County and for the six towns nearest Vermont Yankee that make up the Emergency Planning Zone. The Health Department evaluates trends in all cancer types (all ages, all sites) and evaluates invasive thyroid cancers, leukemia and pediatric (childhood) cancers separately because these types of cancers are associated with excess radiation exposure or radiation exposure during fetal development.

Cancer Prevalence

Cancer is not one disease, but a group of more than 100 different diseases. Cancer is very common. Roughly one out of every two men and one out of every three women will develop some type of cancer in their lifetime. A cancer usually develops gradually as a result of a complex mix of factors related to personal behaviors, environment and genetics. Each type of cancer is caused by a different set of factors, some well established, some uncertain, and some unknown.

Cancer *prevalence* means the number of people alive today who have ever been diagnosed with cancer. According to 2010 Behavioral Risk Factor Surveillance System (BRFSS) data, approximately 30,000 or 6 percent of Vermonters age 18 and older have ever been told by a doctor they had cancer. This includes people who are newly diagnosed, in active treatment, or have completed active treatment, and people living with progressive symptoms of their disease.

With 9 percent of people age 50 and older living with cancer in the U.S., it is not unusual to know several people who have cancer. As a population ages, the occurrence of new

cancer cases can be expected to increase. With treatment advances, people are living longer with a cancer diagnosis. The number of cancer survivors has doubled in the past 20 years.

Cancer Incidence

Cancer *incidence* means the number of newly diagnosed cases during a specific time period. Incidence data in Table 5 were compiled from Vermont Cancer Registry data. Incidence rates are shown for all cancers, invasive thyroid cancers, leukemia, and childhood (pediatric) cancers for the 10 year period 1999 to 2008.

The data in Table 5 indicate that:

- Incidence rates for invasive thyroid cancer and leukemia in the Emergency Planning Zone are not different from Windham County, Vermont as a whole, or the U.S. white population.
- The incidence of thyroid cancer in Windham County is not different from Vermont, but it is lower than the U.S. white rate.
- Incidence rates for pediatric cancers in the six towns could not be calculated as there were too few cases (fewer than six) over the time period studied.
- For all cancer types combined, the rate of cancer incidence in the six towns near Vermont Yankee (Brattleboro, Dummerston, Guilford, Halifax, Marlboro and Vernon) is actually lower than rates in Windham County, Vermont as a whole, and the U.S. white population.

Table 5. Cancer Incidence Rates Near Vermont Yankee, in Vermont & U.S.

Age Adjusted Vermont and U.S. Cancer Incidence, All Sites, Males and Females per 100,000 population, 1999-2008. (Urinary Bladder includes malignant and in situ)

	Rate	Lower CL	Upper CL	Avg. cases per year
U.S. White	491.3	490.3	492.2	107,140
Vermont	499.9	494.5	505.3	3,362
Windham County	484.5	465.5	504.2	250
Emergency Planning Zone	435.0	408.4	463.2	102

Age Adjusted Vermont and U.S. Cancer Incidence, Thyroid, Males and Females per 100,000 population, 1999-2008.

	Rate	Lower CL	Upper CL	Avg. cases per year
U.S. White	10.6	10.4	10.7	2,279
Vermont	10.1	9.3	10.9	66
Windham County	7.2	4.9	10.2	4
Emergency Planning Zone	7.1	3.9	12.2	2

Age Adjusted Vermont and U.S. Cancer Incidence, Leukemia, Males and Females per 100,000 population, 1999-2008.

	Rate	Lower CL	Upper CL	Avg. cases per year
U.S. White	13.9	13.7	14.0	3,005
Vermont	13.6	12.7	14.6	88
Windham County	16.3	12.9	20.4	8
Emergency Planning Zone	11.4	7.4	17.2	3

Age Adjusted Vermont and U.S. Cancer Incidence, Pediatric Cancers (Ages 0-19), Males and Females per 100,000 population, 1999-2008. (Urinary Bladder includes malignant and in situ)

	Rate	Lower CL	Upper CL	Avg. cases per year
U.S. White	17.9	17.5	18.2	1,005
Vermont	19.2	17.1	21.5	31
Windham County	17.2	10.3	27.1	2
Emergency Planning Zone	--	--	--	--

-- Rates are only presented when the number of cases is 6 or greater.
Emergency Planning Zone towns: Brattleboro, Dummerston, Guilford, Halifax, Marlboro, and Vernon.
All rates are age adjusted to the 2000 U.S. standard population and are per 100,000 population.

Cancer Mortality

In Table 6, mortality rates from the U.S., Vermont, Windham County, and the Emergency Planning Zone towns are presented for the 10 years 1999 to 2008. The Vermont data are from the Vermont Department of Health's Vital Statistics System. Data for U.S. cancer mortality rates are from the Vital Statistics System of the United States. Cancer mortality data are presented for all cancers, invasive thyroid cancers, leukemia, and pediatric cancers.

The data in Table 6 indicate:

- For the years 1999 to 2008, cancer mortality rates in the six towns of the Emergency Planning Zone around Vermont Yankee do not differ from those for Windham County, Vermont or the U.S.
- Similar results were seen in mortality rates in the 2009 report.

Table 6. Cancer Mortality Rates Near Vermont Yankee, in Vermont & U.S.

Age Adjusted Vermont and U.S. Cancer Mortality, All Sites, Males and Females per 100,000 population, 1999-2008.

	Rate	Lower CL	Upper CL	Avg. deaths per year
U.S. White	186.5	186.4	186.7	481,355
Vermont	185.3	182.1	188.6	1,238
Windham County	194.8	182.9	207.4	101
Emergency Zone	203.5	185.6	223.1	49

Age Adjusted Vermont and U.S. Cancer Mortality, Invasive Thyroid, Males and Females per 100,000 population, 1999-2008.

	Rate	Lower CL	Upper CL	Avg. deaths per year
U.S. White	0.5	0.5	0.5	1,231
Vermont	0.4	0.3	0.6	3
Windham County	0.4	0.1	1.6	<1
Emergency Zone	0.4	0.0	3.3	<1

Age Adjusted Vermont and U.S. Cancer Mortality, Leukemia, Males and Females per 100,000 population, 1999-2008.

	Rate	Lower CL	Upper CL	Avg. deaths per year
U.S. White	7.6	7.5	7.6	19,411
Vermont	7.4	6.8	8.1	49
Windham County	7.4	5.2	10.3	4
Emergency Zone	7.4	4.2	12.4	2

Age Adjusted Vermont and U.S. Cancer Mortality, Pediatric Cancers (Ages 0-19), Males and Females per 100,000 population, 1999-2008.

	Rate	Lower CL	Upper CL	Avg. deaths per year
U.S. White	2.7	2.7	2.8	1,725
Vermont	2.6	1.9	3.6	4
Windham County	1.0	0.0	5.5	<1
Emergency Zone	2.3	0.0	17.0	<1

Emergency Zone towns include: Brattleboro, Dummerston, Guilford, Halifax, Marlboro, and Vernon.
All rates are age adjusted to the 2000 U.S. standard population and are per 100,000 population.

Cancer Surveillance Methodology

The rates in this report are calculated at a 95 percent confidence level. This means, for example, given a reported incidence rate of 491.3 per 100,000 for the U.S. in 1999-2008, that we are 95 percent confident (not due to chance alone) that the true 1999 to 2008 U.S. white rate is in the range of 490.3 to 492.2 per 100,000. In the six towns near Vermont Yankee, the cancer incidence rate for all types of cancer combined is 435.0 cases per 100,000 people. Statistically speaking, this means we are 95 percent confident that the actual rate is between 408.4 cases and 463.2 cases per 100,000 people. Because the *ranges* for these populations do not overlap, we conclude that there is a meaningful statistical difference between the two rates.

In Table 6, it may appear that the cancer mortality rate, all sites, all ages, in the Emergency Planning Zone around Vermont Yankee is higher than in Windham County or Vermont. However, the confidence intervals (ranges) for these rates do overlap, and therefore the cancer mortality rates are not statistically different. In Windham County, the death rate from cancer, all sites, males and females, was 194.8 deaths per 100,000 people, while the death rate in the six towns near Vermont Yankee was 203.5 deaths per 100,000 people. The same conclusion is drawn for Vermont as a whole. All sites, all ages cancer mortality rates are not significantly different.

Data Limitations

One limitation of these data is that the numbers of cancer cases and the number of cancer deaths in the six towns near Vermont Yankee are small. There are challenges associated with computing rates for small geographical areas, such as the Vermont Yankee Emergency Planning Zone, with an estimated population of 19,800 people. When the rates are based on a small number of cases, it is almost impossible to distinguish random fluctuation from true changes in the underlying risk of disease. This is an issue in a state like Vermont, which has many communities with small populations. To improve rate stability, the cases have been combined for the 10 year period from 1999 through 2008.

For more information about cancer and for resources to assist those living with cancer in Vermont: http://healthvermont.gov/prevent/cancer/cancer_programs.aspx#stats.

Environmental Surveillance Methods

The types of surveys and analyses performed by the Vermont Department of Health are described here in relationship to their role in protecting the public's health from ionizing radiation resulting from operations at Vermont Yankee.

Direct Gamma Radiation Monitoring

Direct gamma radiation in air is measured by the Health Department by using thermoluminescent dosimeters (TLDs). Gamma radiation energy interacts with and changes the materials inside the TLDs. The more gamma energy, the more change occurs in the materials. The TLDs are then tested in a laboratory, by reversing the physical changes. When this occurs, light is emitted, and the amount of light measured in the process is directly related to the amount of gamma radiation energy the TLD received in the environment. These instruments are calibrated to provide a measure of radiation *exposure,* reported in milliroentgen.

TLDs are placed to measure how much direct gamma radiation is being given off from Vermont Yankee, and how much exists from natural or other human-made sources in background areas of Vermont. The Health Department's dosimeters are located on the site boundary (property line), in the area of the station and at background locations in Windham County. A total of 72 locations are monitored. Samples are collected quarterly and sent to a certified laboratory.

Vermont Yankee emits direct gamma radiation from components and nuclear reactor systems, as well as the station's air stack. Measuring the amount emitted is to ensure that no member of the public is exposed to increased levels as a result of operations at Vermont Yankee.

Continuous Flow Air Sampling

Continuous air samplers are located in Vernon, Guilford, Dummerston, Wilmington and Brattleboro. These air samplers have a mechanical pump that pulls air through two types of sample media. The samplers have an in-line flow meter that tracks the volume of air pulled through the sample. The air samplers run continuously.

The samplers collect alpha-, beta- and gamma-emitting materials in air. Each sampler has two collection media to capture these radioactive materials. The first medium is a glass fiber filter. As outdoor air is pulled through the sampler, particulates are collected on the glass fiber filter. Particulates that contain alpha-, beta- and gamma-emitting materials are collected on the glass fiber filter.

Located behind the glass fiber filter is the second medium, a charcoal cartridge. The cartridge is treated with triethylenediamine (TEDA), a compound that attracts radioactive iodine vapors. As air passes through, radioactive iodine as well as other gamma-emitting gases and vapors are collected.

The filter is sent to the Health Department Laboratory where the alpha- and beta-emitting materials are counted on a gas flow proportional counter. The charcoal cartridge is tested by the Health Department Laboratory on a gamma spectrometer. Samples are collected and tested monthly. In addition, every three months the filters are grouped together and tested by gamma spectroscopy. These grouped samples are called quarterly composites.

Measurements of total alpha and beta radiation, gamma radiation and specifically iodine-131 ensure that operations at—and discharges from—Vermont Yankee are within limits and do not result in an increased radiation exposure to the public.

Water Monitoring

Water samples are collected both on-site at Vermont Yankee and off-site at nearby locations. Off-site water samples include drinking water wells, a municipal water supply, and samples from the Connecticut River. These locations allow the Health Department to determine if radioactive materials have left the Vermont Yankee site and entered these waters. On-site groundwater monitoring wells are sampled and tested to determine if any radioactive materials are leaking from systems at Vermont Yankee. On-site drinking water wells are also sampled and tested to ensure that the drinking water supplies are not contaminated.

Water samples can be tested for total alpha and beta radioactivity, and gamma-emitting materials. Alpha and beta radioactivity are tested with a gas proportional counter. Gamma-emitting materials are measured with a gamma spectrometer.

Water samples are also tested for tritium. Tritium is a radioactive form of hydrogen, and a weak beta-emitter. Tritium is created when water passes through the reactor core and the hydrogen atoms in the water molecules absorb neutrons from the fission of the reactor fuel. Tritiated water may leave the power station in the same ways that non-radioactive water leaves the station: in the air, in groundwater, and through discharges into surface waters like the Connecticut River. Tritium is also created from atmospheric radiation. Tritium is tested with a liquid scintillation counter. In January 2010, the confirmation of a positive detection of tritium in groundwater monitoring well GZ-03 identified an unmonitored release of radioactive materials eventually found to be from the Advanced Off-Gas (AOG) Building at Vermont Yankee.

In 2010, water samples were also tested for four hard-to-detect radioactive metals: strontium-89, strontium-90, iron-55, and nickel-63. The Health Department contracted a certified laboratory to perform these water analyses. Strontium-90 is associated with nuclear fission, but was also released in significant quantities in the 1940s, 50s and 60s during above-ground weapons testing, and as a result of global nuclear events like

Chernobyl. Nickel-63 and iron-55 are associated with nuclear facility operations. These radioactive metals can be released from leaking reactor systems or through permitted discharges. They are not identifiable by routine laboratory test methods.

Monitoring Food Chain Inputs

The Health Department also tests milk, sediment, soil, vegetation and fish in the Vernon and Brattleboro area.

Milk Sampling

Milk samples are collected from two farms located in the vicinity of Vermont Yankee. Raw cows' milk samples are taken twice a month and tested for gamma-emitting materials and specifically for iodine-131 (I-131).

Sediment Sampling

Sediments from the bottom of the Connecticut River are collected twice a year. They are tested for gamma-emitting materials.

Soil and Vegetation Sampling

Soil and vegetation are collected in areas near Vermont Yankee and tested for gamma-emitting materials. A variety of natural and cultivated plants are sampled to determine if radioactive materials are accumulating in the food chain. Vegetation samples are taken both in the immediate vicinity of Vermont Yankee and in the surrounding community. Soil samples are collected at the same locations that vegetation samples are collected.

In 2010, soil was excavated as part of the investigation into the leaks near the Advanced Off-Gas Building. This soil was removed from the site and disposed of in a licensed disposal facility. The soil was removed to prevent contaminants from entering the Connecticut River.

Fish Sampling

Fish are collected monthly at two sites in the Connecticut River by an environmental contractor. One site is outside the Vermont Yankee discharge and the other site is about nine miles upstream from Vermont Yankee, where the Route 9 bridge crosses the Connecticut River. Fish are caught by a method known as electro-fishing. This involves putting a slight electric current in the water. Fish exposed to the current are stunned and float to the surface where they are collected. Sport and pan fish species are caught and tested: large and small mouth bass, yellow perch and pumpkinseed.

Fish can be tested either as a whole fish, or divided into edible and inedible portions. The extent of the testing that can be done depends on the mass of fish caught and the testing laboratory's procedures. The Health Department Laboratory tests whole fish for gamma-emitting materials. A contracted laboratory tested fish for strontium-90 and other hard-to-detect radioactive metals strontium-89, nickel-63, iron-55. These were tested for in separate edible and inedible portions.

Laboratory Testing and Measurements

Laboratory instruments at the Health Department that are used to test samples are able to measure very small amounts of radioactivity. Each instrument has a limit as to how low it can measure or identify radioactivity. This limit is determined by the Health Department radiochemists and reported as the *Lower Limit of Detection* (LLD). Lower Limits of Detection are calculated for each sample, taking into account the specific instrument and sample characteristics such as type (*e.g.* water, soil, milk, air), length of time the sample is tested, and the amount of the sample tested. The Health Department's Lower Limits of Detection for gamma spectroscopy tests are presented in Table 8.

All the Health Department's instruments meet strict quality control checks. Data reported by the Health Department is thoroughly reviewed by both the radiochemists and data review personnel.

Units of Measurement

For most results in this report, radioactivity is reported in units of *picocuries per mass or volume* of sample. One picocurie is one trillionth of a curie or 0.000000000001 curie. Curies and picocuries are units that measure the amount of "activity" in the sample.

Direct gamma exposure is measured and reported in milliroentgens. Milliroentgen is a unit of exposure to ionizing radiation. One milliroentgen is equal to one thousandth of a roentgen or 0.001 roentgens.

Table 7. Units of Measurement

Type	Unit	Abbreviation	Measures (amount of)	Equivalent to
Radiation units	curie	Ci	activity of a radioactive material	1000000000000 picocuries (pCi)
	picocurie	pCi	activity of a radioactive material	0.000000000001 curie (Ci)
	roentgen	R	*exposure* to ionizing radiation	1000 milliroentgens (mR)
	milliroentgen	mR	*exposure* to ionizing radiation	0.001 roentgen (R)
	roentgen **e**quivalent **m**an	rem	*dose* equivalent of ionizing radiation	1000 millirems (mrem)
	milli**rem**	mrem	*dose* equivalent of ionizing radiation	0.001 roentgen equivalent man (rem)
Mass & Volume units	gram	g	mass	0.001 kilogram (kg)
	kilogram	kg	mass	1000 grams (g)
	liter	L	volume of liquid	1000 milliliters (mL)
	milliliter	mL	volume of liquid	0.001 liter (L)
	cubic meter	m^3	volume of air	

Roentgens are units of environmental exposure. To determine the effect that the exposure would have on a person, roentgens are converted to **rem** ("**r**oentgen **e**quivalent **m**an"). A rem accounts for both the amount of radiation energy absorbed by a person and the potential biological effects of that energy in the human body. The Health Department's Radiological Health Rule provides limits for gamma radiation emitted from Vermont Yankee in units of measured exposure and relates it to a *biological dose*. As the Vermont Yankee site boundary TLDs measure in milliroentgens, the corresponding limit in milliroentgens applies. Personal TLDs, like those worn by workers in nuclear power, medical or research facilities, are calibrated to provide a measure of *biological dose* for the wearer and are reported in millirems.

Uncertainty of Radiation Measurements

Measurements reported by a laboratory have an amount of *uncertainty* associated with them. Uncertainty is sometimes called error. Uncertainty results from variability in sampling and testing. The smaller the uncertainty associated with a measurement, the more accurate the number reported is likely to be. The uncertainty associated with a value is calculated by radiochemists and reported as a plus/minus (+/-) value. All of the measurements in this report are presented at the 95 percent confidence level. This means it is 95 percent certain (not due to chance alone) that the results are within the value and error range reported. Uncertainty can be minimized by increasing instrument efficiency, sample size and counting time.

Uncertainty of Thermoluminescent Dosimeter (TLD) Measurements

Dosimeter measurements over time are estimates and are also subject to uncertainty. The error for the sum of the quarterly results is the total propagated error at the 95 percent confidence level. The formula for the propagation of error is a root-mean-square formula:

$$[(\sigma_1^2) + (\sigma_2^2) + (\sigma_3^2) + (\sigma_4^2)]^{1/2}$$

Where (σ_1^2) is the uncertainty for quarter 1, (σ_2^2) is the uncertainty for quarter 2, (σ_3^2) is the uncertainty for quarter 3 and (σ_4^2) is the uncertainty for quarter 4. The Health Department regulates the direct gamma radiation exposure on the reported value.

Table 8. Health Department Gamma Spectroscopy Calculated Lower Limit of Detections

Radioactive element	Calculated Lower Limit of Detection: fish, water, vegetation & milk (pCi/L or pCi/kg)	Calculated Lower Limit of Detection: soil, sediment (pCi/kg)
Antimony-124	3	23
Antimony-126	3	23
Barium-133	4	30
Beryllium-7	24	183
Cadmium-109	48	349
Cerium-139	3	18
Cerium-141	4	29
Cerium-144	16	115
Cesium-134	4	18
Cesium-136	3	23
Cesium-137	4	24
Chromium-51	24	182
Cobalt-57	2	14
Cobalt-58	3	23
Cobalt-60	3	23
Iodine-131	3	23
Manganese-54	4	24
Mercury-203	3	22
Potassium-40	48	367
Ruthenium-103	3	22
Ruthenium-106	29	220
Silver-110m	3	23
Strontium-85	4	26
Tin-113	4	31
Yttrium-88	4	26
Zinc-65	6	46

Direct Gamma Radiation Results

Thermoluminescent dosimeters (TLDs) are located along the Vermont Yankee site boundary (property line) and in public areas in Vernon and in other Windham County towns. Thirteen TLDs placed at the Vermont Yankee site boundary are evaluated for compliance with the regulations detailed in the Health Department's Radiological Health Rule. The Health Department limits the measured exposure at the site boundary to no more than 20 milliroentgens per year above background radiation, and no more than 10 milliroentgens per calendar quarter above background radiation. The limit corresponds to the annual effective dose equivalent limit of 5 millirems for any member of the public in an unrestricted area.

Site boundary TLDs:

- VY North Fence
- VY North Fence #2
- VY SW Fence
- VY SW Fence #2
- VY Parking Lot A
- VDH T07A
- Governor Hunt Road # 39
- VDH T07B
- VDH DR42
- VDH DR48
- VDH DR51A
- VDH DR52A
- VDH DR53A

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Five additional TLDs—VDH DR43, DR44, DR45, DR46 and DR47—are located on the Connecticut River site boundary and are subject to the U.S. Nuclear Regulatory Commission limit of 100 millirems per year.

Additional Health Department TLDs are located in other areas of Vernon, and in Guilford, Brattleboro, Dummerston, Putney and Wilmington. These provide the background measurements of direct gamma radiation from both natural and human-made sources unrelated to the operation of Vermont Yankee.

All TLDs are collected and tested every three months (quarterly).

Comparison to Background Levels

To determine the amount of direct gamma radiation exposure attributed to emissions from Vermont Yankee, the background gamma radiation is subtracted from the site boundary (property line) measurements. Background gamma radiation unrelated to Vermont Yankee may be from naturally-occurring sources, other industrial applications, and global contaminants remaining from above-ground weapons testing during the 1940s, 50s and 60s and global nuclear incidents like Chernobyl.

To measure the background of direct gamma radiation, 34 TLDs are placed in locations beyond the immediate area of Vermont Yankee's operations. These locations are as far west as Wilmington, as far north as Putney, and as far south as the Massachusetts state line in Guilford and Vernon. Each quarter's average exposure to these 34 TLDs is calculated and used to estimate environmental background radiation. Background gamma radiation levels for the four quarters of 2010 are presented in Table 9.

The exposures reported in Tables 10 and 11 show the total (gross) dosimeter measurement and the net value. The net value is calculated by subtracting the background radiation measurement from the total radiation measurement. For regulatory purposes, the net values are compared to the quarterly and annual limits. The net background exposure results are in Table 9.

Table 9. 2010 Average Direct Gamma Background Radiation Results

Calendar **Quarter**	Average Background Exposure Measurements (milliroentgen)
January 1 to March 31	14.6 ± 2.1
April 1 to June 30	14.7 ± 2.5
July 1 to September 30	15.3 ± 2.7
October 1 to December 31	14.6 ± 5.7
Total for Calendar Year **2010**	59.2 ± 7.1
Calendar Year 2009	57. 9 ± 4.8
Calendar Year 2008	56.4 ± 4.6
Calendar Year 2007	56.2 ± 5.2

2010 Direct Gamma Radiation Exposure Results

The following tables are the results of the Health Department's TLD measurements of direct gamma radiation. Table 10 contains the results for the Vermont Yankee site boundary, and the dosimeters in the immediate area around the power station. Table 11 contains the results for the 34 dosimeters placed in locations beyond the immediate area of Vermont Yankee.

In 2010:

- 288 TLDs were tested for direct gamma radiation.
  - 136 of those provided background exposure measurements
  - 152 of those provided exposure measurements at the site boundary and in the immediate area of Vermont Yankee

Dosimeter locations on the site boundary bordered by land and used for direct gamma radiation compliance measurements reflect Vermont Yankee property purchases on or before August 1, 2008. These dosimeter locations are highlighted in pink in Table 10.

For 2010, site boundary dosimeters used for verifying compliance for the year ranged from 0 to 16.1 milliroentgens.

Map 3 shows the locations of the site boundary and station area dosimeters. Maps 4 and 5 show the locations of the background dosimeters. The ID numbers on the maps can be matched to the locations in tables 10 and 11.

For 2010, the quarterly limit of 10 milliroentgen and the annual limit of 20 milliroentgen were not exceeded. As neither exposure limit was exceeded at the site boundary bordered by land, Vermont's annual effective dose equivalent limit of 5 millirem for any member of the general public in an unrestricted area was not exceeded for 2010.

Map 3

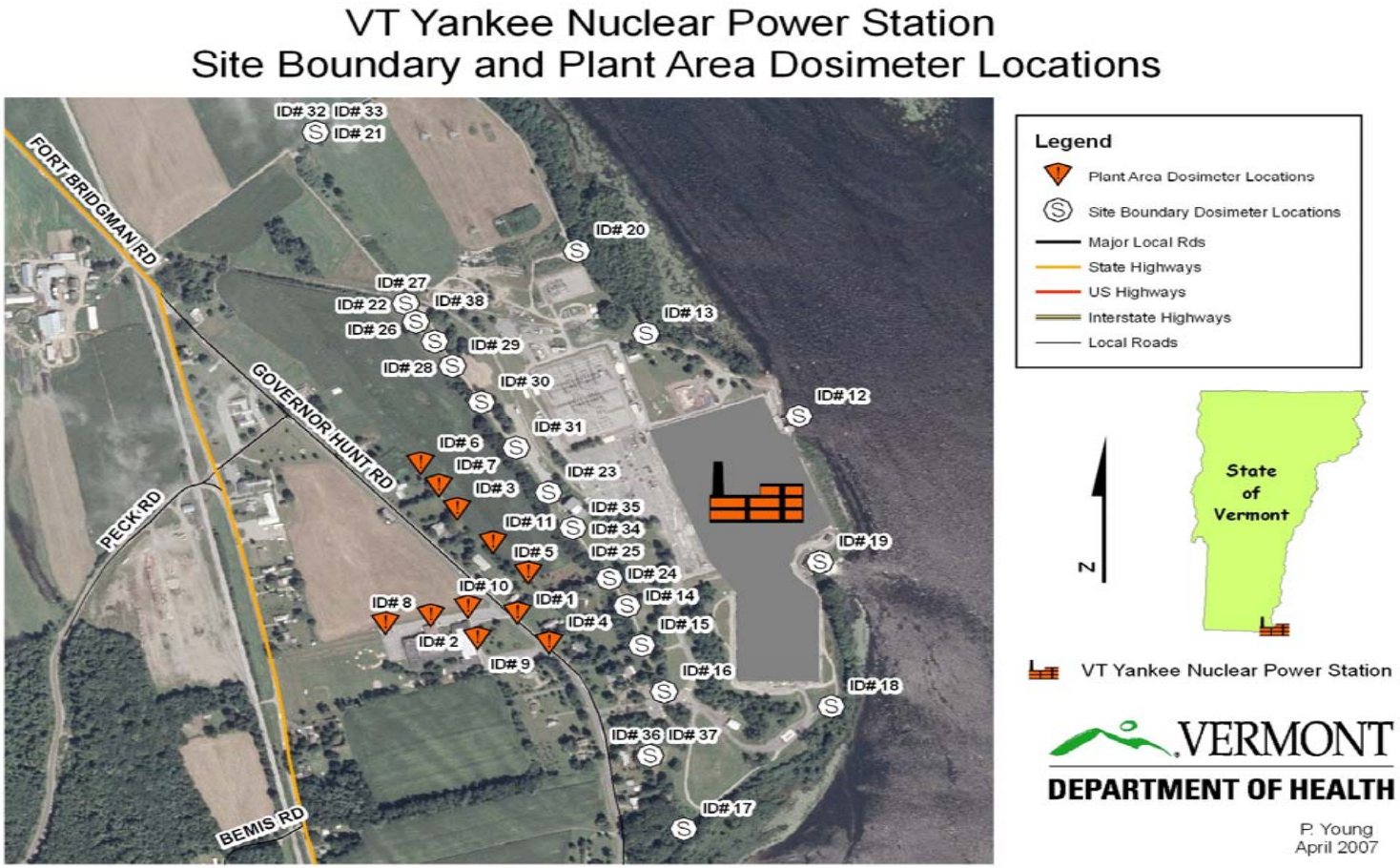

VT Yankee Nuclear Power Station
Site Boundary and Plant Area Dosimeter Locations
FORT BRIDGMAN RD
GOVERNOR HUNT RD
PECK RD
BEMIS RD
ID# 32
ID# 33
ID# 21
ID# 20
ID# 27
ID# 22
ID# 38
ID# 26
ID# 29
ID# 28
ID# 30
ID# 31
ID# 6
ID# 7
ID# 23
ID# 3
ID# 35
ID# 11
ID# 34
ID# 5
ID# 25
ID# 24
ID# 10
ID# 1
ID# 14
ID# 8
ID# 4
ID# 15
ID# 2
ID# 9
ID# 16
ID# 36
ID# 37
ID# 17
ID# 13
ID# 12
ID# 19
ID# 18
Legend
Plant Area Dosimeter Locations
Site Boundary Dosimeter Locations
Major Local Rds
State Highways
US Highways
Interstate Highways
Local Roads
N
State of Vermont
VT Yankee Nuclear Power Station
VERMONT
DEPARTMENT OF HEALTH
P. Young
April 2007

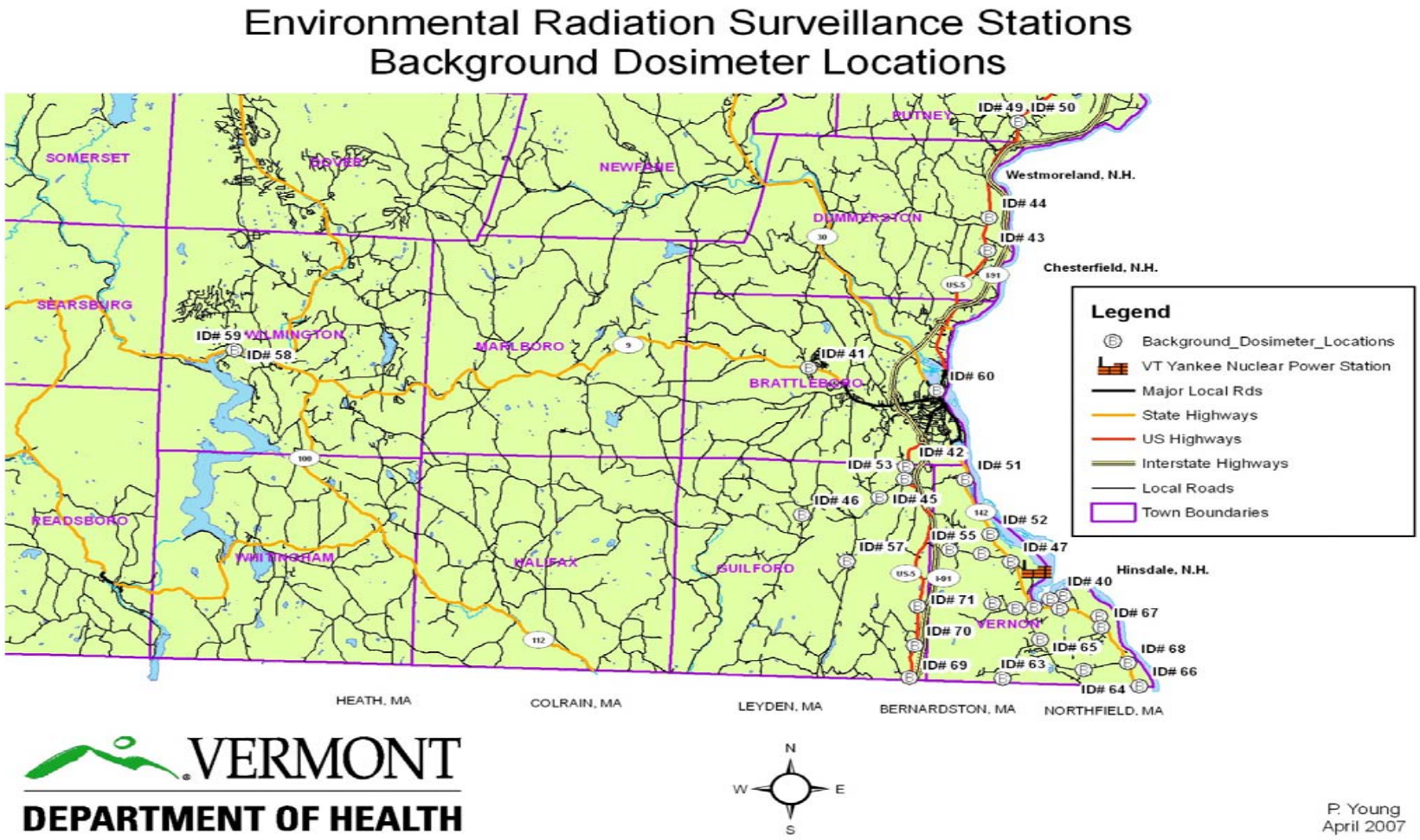
Table 10. 2010 Thermoluminescent Dosimeter Exposure Measurements and Net Gamma Radiation: Station Area & Site Boundary Locations

2010 Site Boundary and Station Area Dosimeter Exposure (milliroentgen)																											
Location	Map	Qtr1	1SD	Avg	Qtr1	Net	2SD	Qrtr2	1SD	Avg	Qtr2	Net	2SD	Qrtr3	1SD	Avg	Qtr3	Net	2SD	Qrtr4	1SD	Avg	Qtr4	Net	2SD	2010	2SD
	ID	Gross	Error	BKGD	Net	>=0	Error	Gross	Error	BKGD	Net	>=0	Error	Gross	Error	BKGD	Net	>=0	Error	Gross	Error	BKGD	Net	>=0	Error	Net	Error
VDH T01	ID#22	14.6	0.8	14.6	0.0	0.0	1.6	15.0	0.8	14.7	0.3	0.3	1.6	15.7	0.6	15.3	0.4	0.4	1.1	14.8	0.8	14.6	0.2	0.2	1.5	0.8	2.9
VDH T02	ID#38	14.8	0.76	14.6	0.2	0.2	1.5	14.5	1.0	14.7	-0.3	0.0	1.9	15.9	0.6	15.3	0.6	0.6	1.1	15.8	0.7	14.6	1.2	1.2	1.3	2.1	3.0
VDH T03	ID#26	15.0	0.6	14.6	0.4	0.4	1.2	15.1	1.2	14.7	0.3	0.3	2.3	16.1	0.6	15.3	0.8	0.8	1.2	15.5	0.7	14.6	0.9	0.9	1.3	2.4	3.2
VDH T04	ID#29	15.7	0.9	14.6	1.1	1.1	1.7	15.3	1.3	14.7	0.6	0.6	2.5	16.6	0.7	15.3	1.2	1.2	1.3	16.5	1.0	14.6	1.9	1.9	1.9	4.9	3.8
VDH T05	ID#28	17.0	0.7	14.6	2.4	2.4	1.3	16.5	0.9	14.7	1.8	1.8	1.7	17.3	0.6	15.3	2.0	2.0	1.2	17.0	0.8	14.6	2.4	2.4	1.6	8.6	2.9
VDH T06	ID#30	17.4	0.6	14.6	2.8	2.8	1.2	17.2	1.1	14.7	2.5	2.5	2.1	18.9	1.0	15.3	3.6	3.6	2.0	18.0	1.0	14.6	3.4	3.4	2.0	12.3	3.7
VDH DR07	ID#31	18.6	1.2	14.6	4.0	4.0	2.3	17.7	0.9	14.7	3.0	3.0	1.7	19.6	0.8	15.3	4.3	4.3	1.6	18.7	1.0	14.6	4.2	4.2	2.0	15.4	3.8
VDH DR08	ID#15	20.6	0.7	14.6	6.0	6.0	1.3	18.6	1.1	14.7	3.9	3.9	2.2	21.7	1.6	15.3	6.4	6.4	3.2	20.2	1.1	14.6	5.6	5.6	2.1	22.0	4.6
VDH DR41	ID#16	16.9	0.9	14.6	2.3	2.3	1.8	16.1	0.8	14.7	1.4	1.4	1.5	17.2	0.7	15.3	1.9	1.9	1.4	16.8	0.9	14.6	2.2	2.2	1.7	7.8	3.2
VY SW Fence	ID#36	13.9	0.8	14.6	-0.7	0.0	1.6	14.2	0.9	14.7	-0.5	0.0	1.7	16.0	0.9	15.3	0.7	0.7	1.7	14.3	1.1	14.6	-0.2	0.0	2.2	0.7	3.6
VY SW Fence #2	ID#37	14.0	0.8	14.6	-0.6	0.0	1.6	14.2	0.9	14.7	-0.5	0.0	1.8	15.2	0.6	15.3	-0.1	0.0	1.2	15.1	0.9	14.6	0.6	0.6	1.8	0.6	3.3
VDH DR42	ID#17	14.6	0.7	14.6	0.0	0.0	1.3	16.3	0.9	14.7	1.6	1.6	1.7	16.0	0.6	15.3	0.7	0.7	1.1	16.2	1.2	14.6	1.7	1.7	2.3	4.0	3.3
VDH DR43	ID#18	17.2	0.7	14.6	2.6	2.6	1.3	17.2	0.6	14.7	2.5	2.5	1.2	18.4	1.0	15.3	3.1	3.1	1.9	18.0	0.9	14.6	3.5	3.5	1.8	11.7	3.1
VDH DR44	ID#19	20.8	1.1	14.6	6.2	6.2	2.1	20.3	0.9	14.7	5.6	5.6	1.8	22.8	0.8	15.3	7.5	7.5	1.5	22.8	1.5	14.6	8.2	8.2	2.9	27.5	4.3
VDH DR45	ID#12	29.3	1.4	14.6	14.7	14.7	2.8	28.5	2.1	14.7	13.8	13.8	4.1	28.7	1.3	15.3	13.4	13.4	2.5	35.3	3.1	14.6	20.7	20.7	6.1	62.7	8.2
VDH DR46	ID#13	22.9	1.1	14.6	8.3	8.3	2.1	19.9	1.5	14.7	5.2	5.2	2.8	22.0	0.9	15.3	6.7	6.7	1.7	21.4	1.0	14.6	6.8	6.8	1.9	27.0	4.4
VDH DR47	ID#20	17.8	0.6	14.6	3.2	3.2	1.2	17.9	0.7	14.7	3.1	3.1	1.4	18.3	0.8	15.3	3.0	3.0	1.5	17.9	0.9	14.6	3.3	3.3	1.7	12.7	3.0
VDH DR48	ID#22	13.4	0.5	14.6	-1.2	0.0	1.0	13.1	0.7	14.7	-1.6	0.0	1.3	14.0	0.5	15.3	-1.4	0.0	1.0	13.1	0.9	14.6	-1.5	0.0	1.8	0.0	2.6
VY North Fence	ID#32	15.1	0.8	14.6	0.5	0.5	1.5	15.4	0.6	14.7	0.7	0.7	1.2	16.2	0.6	15.3	0.9	0.9	1.2	15.3	0.8	14.6	0.7	0.7	1.6	2.8	2.8
VY North Fence #2	ID#33	15.3	0.7	14.6	0.7	0.7	1.5	15.7	0.8	14.7	1.0	1.0	1.5	16.4	0.7	15.3	1.1	1.1	1.3	15.7	0.8	14.6	1.1	1.1	1.5	3.9	2.9
VDH DR49	ID#27	14.6	0.7	14.6	0.0	0.0	1.4	14.4	0.8	14.7	-0.3	0.0	1.6	15.0	0.9	15.3	-0.3	0.0	1.8	15.3	0.8	14.6	0.7	0.7	1.6	0.7	3.2
VDH DR51	ID#23	20.4	0.7	14.6	5.8	5.8	1.4	18.4	1.3	14.7	3.6	3.6	2.6	21.3	0.9	15.3	6.0	6.0	1.8	19.5	1.2	14.6	4.9	4.9	2.3	20.4	4.1
VDH DR52	ID#24	21.7	0.8	14.6	7.1	7.1	1.5	19.4	1.3	14.7	4.7	4.7	2.6	22.1	1.1	15.3	6.8	6.8	2.2	22.0	1.7	14.6	7.4	7.4	3.3	26.0	5.0
VY Parking Lot	ID#35	22.1	1.3	14.6	7.5	7.5	2.5	20.6	0.8	14.7	5.9	5.9	1.6	22.2	0.8	15.3	6.8	6.8	1.6	22.5	1.1	14.6	7.9	7.9	2.2	28.1	4.1

Table 10 (continued). 2010 Thermoluminescent Dosimeter Exposure Measurements and Net Gamma Radiation: Station Area & Site Boundary Locations

2010 Site Boundary and Station Area Dosimeter Exposure (milliroentgen)																											
Location	Map	Qtr1	1SD	Avg	Qtr1	Net	2SD	Qrtr2	1SD	Avg	Qtr2	Net	2SD	Qrtr3	1SD	Avg	Qtr3	Net	2SD	Qrtr4	1SD	Avg	Qtr4	Net	2SD	2010	2SD
	ID	Gross	Error	BKGD	Net	>=0	Error	Gross	Error	BKGD	Net	>=0	Error	Gross	Error	BKGD	Net	>=0	Error	Gross	Error	BKGD	Net	>=0	Error	Net	Error
VY Parking Lot #2	ID#34	22.0	0.9	14.6	7.4	7.4	1.8	19.7	1.1	14.7	5.0	5.0	2.1	22.2	1.0	15.3	6.9	6.9	1.9	22.2	0.8	14.6	7.6	7.6	1.5	26.9	3.7
VDH DR53	ID#25	23.1	0.7	14.6	8.5	8.5	1.5	20.7	0.7	14.7	6.0	6.0	1.4	23.6	1.4	15.3	8.3	8.3	2.8	22.7	1.4	14.6	8.1	8.1	2.8	30.8	4.5
VDH T07A	ID#6	16.4	0.6	14.6	1.8	1.8	1.3	16.4	0.9	14.7	1.6	1.6	1.8	17.1	0.9	15.3	1.8	1.8	1.7	16.3	0.9	14.6	1.7	1.7	1.8	7.0	3.3
VDH T07B	ID#7	15.6	0.8	14.6	1.0	1.0	1.5	16.4	1.1	14.7	1.7	1.7	2.2	18.4	0.8	15.3	3.1	3.1	1.6	17.3	0.8	14.6	2.7	2.7	1.5	8.5	3.5
VDH DR51A	ID#3	17.6	1.7	14.6	3.0	3.0	3.3	16.0	1.1	14.7	1.3	1.3	2.1	18.3	1.0	15.3	3.0	3.0	1.9	17.4	0.9	14.6	2.8	2.8	1.7	10.1	4.7
VY PARKING LOT A	ID#11	17.2	0.7	14.6	2.6	2.6	1.4	17.5	1.1	14.7	2.7	2.7	2.1	19.1	1.2	15.3	3.8	3.8	2.3	18.6	0.9	14.6	4.1	4.1	1.7	13.2	3.9
VDH DR53A	ID#5	18.4	1.0	14.6	3.8	3.8	2.0	18.0	1.5	14.7	3.3	3.3	2.9	20.0	1.0	15.3	4.7	4.7	2.0	18.9	0.7	14.6	4.3	4.3	1.4	16.1	4.3
Gov Hunt Road # 39	ID#1	17.3	0.8	14.6	2.7	2.7	1.5	16.8	0.7	14.7	2.1	2.1	1.4	17.7	1.2	15.3	2.3	2.3	2.3	17.0	0.6	14.6	2.4	2.4	1.3	9.5	3.3
Vernon Schl Nurse	ID#9	19.1	0.7	14.6	4.5	4.5	1.4	18.1	1.2	14.7	3.4	3.4	2.3	17.8	0.8	15.3	2.5	2.5	1.5	19.0	1.1	14.6	4.4	4.4	2.2	14.9	3.8
VDH DR06	ID#2	15.3	0.6	14.6	0.7	0.7	1.2	15.3	0.6	14.7	0.6	0.6	1.2	16.0	0.8	15.3	0.7	0.7	1.5	15.2	1.0	14.6	0.6	0.6	1.9	2.6	2.9
Vernon School A/S	ID#8	15.1	0.6	14.6	0.5	0.5	1.2	15.8	0.7	14.7	1.1	1.1	1.4	16.5	0.7	15.3	1.2	1.2	1.4	16.2	0.6	14.6	1.6	1.6	1.2	4.4	2.6
VDH DR52A	ID#4	17.6	0.7	14.6	3.0	3.0	1.3	17.1	1.0	14.7	2.4	2.4	1.9	18.2	0.7	15.3	2.9	2.9	1.3	17.2	0.8	14.6	2.6	2.6	1.6	10.8	3.1
Vernon School Pole	ID#10	15.1	0.8	14.6	0.5	0.5	1.5	15.0	0.7	14.7	0.2	0.2	1.3	15.7	1.0	15.3	0.4	0.4	2.0	15.6	0.9	14.6	1.0	1.0	1.8	2.1	3.4
Meteorology Tower		15.2	0.8	14.6	0.6	0.6	1.6	15.6	1.2	14.7	0.8	0.8	2.4	16.1	0.5	15.3	0.8	0.8	1.0	15.6	0.7	14.6	1.0	1.0	1.3	3.3	3.3
Dosimeters on the Site Boundary Bounded by Land																											

Map 4


Environmental Radiation Surveillance Stations
Background Dosimeter Locations
SOMERSET
READSBORO
SEARSBURG
WILMINGTON
WHITINGHAM
MARLBORO
HALIFAX
NEWFANE
PUTNEY
DUMMERSTON
BRATTLEBORO
GUILFORD
VERNON
Westmoreland, N.H.
Chesterfield, N.H.
Hinsdale, N.H.
ID# 49
ID# 50
ID# 44
ID# 43
ID# 41
ID# 60
ID# 59
ID# 58
ID# 42
ID# 53
ID# 51
ID# 46
ID# 45
ID# 52
ID# 55
ID# 57
ID# 47
ID# 40
ID# 71
ID# 67
ID# 70
ID# 65
ID# 68
ID# 69
ID# 63
ID# 66
ID# 64
HEATH, MA
COLRAIN, MA
LEYDEN, MA
BERNARDSTON, MA
NORTHFIELD, MA
Legend
Background_Dosimeter_Locations
VT Yankee Nuclear Power Station
Major Local Rds
State Highways
US Highways
Interstate Highways
Local Roads
Town Boundaries
VERMONT
DEPARTMENT OF HEALTH
N
W
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S
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Map 5

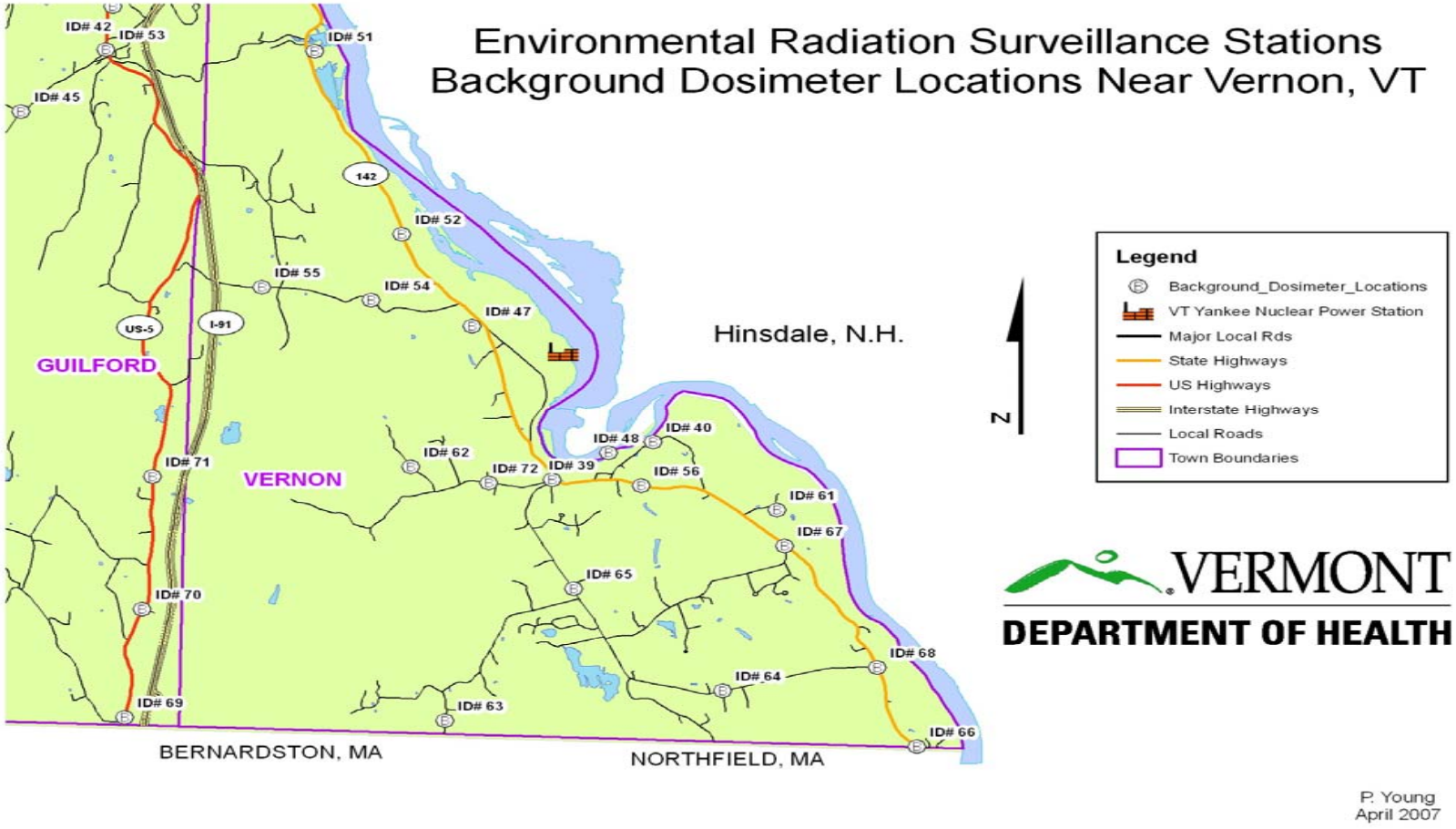

Environmental Radiation Surveillance Stations
Background Dosimeter Locations Near Vernon, VT
ID# 42
ID# 53
ID# 51
ID# 45
142
ID# 52
ID# 55
ID# 54
ID# 47
US-5
I-91
GUILFORD
Hinsdale, N.H.
ID# 48
ID# 40
ID# 62
ID# 71
VERNON
ID# 72
ID# 39
ID# 56
ID# 61
ID# 67
ID# 65
ID# 70
ID# 68
ID# 64
ID# 69
ID# 63
ID# 66
BERNARDSTON, MA
NORTHFIELD, MA
N
Legend
Background_Dosimeter_Locations
VT Yankee Nuclear Power Station
Major Local Rds
State Highways
US Highways
Interstate Highways
Local Roads
Town Boundaries
VERMONT
DEPARTMENT OF HEALTH
P. Young
April 2007

Table 11. 2010 Thermoluminescent Dosimeter Exposure Measurements and Net Gamma Radiation: Background Locations

2010 Background Dosimeter Exposure (milliroentgen)

Location	Map	Qtr1	1SD	Mean	Qtr1	Net	2SD	Qrtr2	1SD	Mean	Qtr2	Net	2SD	Qrtr3	1SD	Mean	Qtr3	Net	2SD	Qrtr4	1SD	Mean	Qtr4	Net	2SD	2010	2SD
	ID	Gross	Error	BKGD	Net	>=0	Error	Gross	Error	BKGD	Net	>=0	Error	Gross	Error	BKGD	Net	>=0	Error	Gross	Error	BKGD	Net	>=0	Error	Net	Error
Putney Town Clerk	ID#50	13.5	0.6	14.6	-1.1	0.0	1.2	13.3	0.6	14.7	-1.4	0.0	1.2	13.6	0.7	15.3	-1.7	0.0	1.5	12.8	0.6	14.6	-1.8	0.0	1.1	0.0	2.5
Putney Pole	ID#49	15.9	0.8	14.6	1.3	1.3	1.6	15.5	1.0	14.7	0.8	0.8	2.0	16.4	1.0	15.3	1.1	1.1	1.9	15.9	0.8	14.6	1.3	1.3	1.6	4.5	3.5
Dummerston School	ID#44	14.8	0.5	14.6	0.2	0.2	1.0	15.1	0.6	14.7	0.4	0.4	1.2	16.1	0.6	15.3	0.8	0.8	1.1	15.2	0.8	14.6	0.6	0.6	1.5	1.9	2.4
Dummerston AOT	ID#43	14.9	0.7	14.6	0.3	0.3	1.4	15.0	0.8	14.7	0.3	0.3	1.6	15.7	0.9	15.3	0.4	0.4	1.7	15.4	0.9	14.6	0.9	0.9	1.8	1.8	3.2
Windham Cnty Crt	ID#60	16.2	1.0	14.6	1.6	1.6	2.0	15.9	0.6	14.7	1.2	1.2	1.2	16.0	0.8	15.3	0.7	0.7	1.6	15.5	0.7	14.6	0.9	0.9	1.4	4.4	3.2
Renaud Brothers	ID#51	17.4	0.7	14.6	2.8	2.8	1.3	15.9	0.6	14.7	1.2	1.2	1.2	17.0	0.8	15.3	1.7	1.7	1.6	17.2	1.2	14.6	2.6	2.6	2.3	8.3	3.3
Rt 142 N Trans Line	ID#52	14.8	0.8	14.6	0.2	0.2	1.6	14.9	0.8	14.7	0.2	0.2	1.5	14.7	0.7	15.3	-0.6	0.0	1.4	0.0	0.0	14.6	-14.6	0.0	0.0	0.4	2.7
Tyler Hill Road	ID#54	15.2	0.6	14.6	0.6	0.6	1.2	15.5	0.8	14.7	0.8	0.8	1.6	16.1	0.8	15.3	0.7	0.7	1.5	15.5	0.7	14.6	0.9	0.9	1.4	3.1	2.8
Miller Farm	ID#47	13.7	0.6	14.6	-0.9	0.0	1.2	13.3	0.7	14.7	-1.4	0.0	1.3	13.3	0.8	15.3	-2.1	0.0	1.5	12.7	0.8	14.6	-1.8	0.0	1.6	0.0	2.8
142/Pond Road N	ID#39	14.0	0.6	14.6	-0.6	0.0	1.2	13.6	0.8	14.7	-1.1	0.0	1.6	15.5	0.7	15.3	0.2	0.2	1.4	14.3	1.2	14.6	-0.3	0.0	2.4	0.2	3.4
Fairman Road	ID#62	14.1	0.6	14.6	-0.5	0.0	1.2	14.2	1.2	14.7	-0.5	0.0	2.4	15.6	0.7	15.3	0.2	0.2	1.4	15.4	0.9	14.6	0.8	0.8	1.8	1.0	3.5
West Rd/Edgewood	ID#72	13.4	0.5	14.6	-1.2	0.0	1.0	14.2	1.1	14.7	-0.5	0.0	2.1	15.0	0.7	15.3	-0.4	0.0	1.4	15.5	0.9	14.6	1.0	1.0	1.7	1.0	3.2
Vernon Fire Station	ID#56	13.7	0.7	14.6	-0.9	0.0	1.4	13.7	0.8	14.7	-1.0	0.0	1.5	14.5	0.7	15.3	-0.9	0.0	1.4	15.1	0.7	14.6	0.5	0.5	1.5	0.5	2.9
Power Line R Crssng	ID#48	15.1	0.9	14.6	0.5	0.5	1.7	14.8	0.7	14.7	0.1	0.1	1.3	15.2	0.9	15.3	-0.1	0.0	1.8	14.7	1.1	14.6	0.1	0.1	2.2	0.7	3.6
A&M Auto/Smead Rd	ID#40	14.1	0.6	14.6	-0.5	0.0	1.2	14.3	0.6	14.7	-0.4	0.0	1.1	14.5	0.7	15.3	-0.8	0.0	1.3	14.7	0.9	14.6	0.1	0.1	1.7	0.1	2.7
Blodgett Farm	ID#61	15.1	1.0	14.6	0.5	0.5	1.9	14.8	0.8	14.7	0.1	0.1	1.5	14.4	0.7	15.3	-1.0	0.0	1.4	14.7	0.9	14.6	0.1	0.1	1.7	0.7	3.2
Rt 142 & Newton Rd	ID#67	13.3	0.6	14.6	-1.3	0.0	1.1	12.6	0.8	14.7	-2.1	0.0	1.6	13.1	0.8	15.3	-2.2	0.0	1.5	13.2	0.9	14.6	-1.4	0.0	1.7	0.0	3.0
Rt 142 & Pond Rd S	ID#68	14.7	0.9	14.6	0.1	0.1	1.8	14.9	0.7	14.7	0.2	0.2	1.4	15.1	0.7	15.3	-0.2	0.0	1.3	13.8	0.9	14.6	-0.8	0.0	1.7	0.3	3.1
Rt 142 & Depot St	ID#66	15.1	0.7	14.6	0.5	0.5	1.3	14.3	1.2	14.7	-0.4	0.0	2.4	14.8	0.7	15.3	-0.6	0.0	1.3	14.6	0.9	14.6	0.1	0.1	1.8	0.5	3.5
Pond Rd & Houghton	ID#64	13.7	0.8	14.6	-0.9	0.0	1.5	15.5	0.6	14.7	0.8	0.8	1.2	15.5	0.9	15.3	0.2	0.2	1.8	14.1	0.7	14.6	-0.5	0.0	1.4	1.0	3.0
Pond Rd/Vernon Rec	ID#65	13.1	0.6	14.6	-1.5	0.0	1.1	12.7	0.8	14.7	-2.0	0.0	1.5	12.9	0.5	15.3	-2.4	0.0	0.9	12.4	0.9	14.6	-2.2	0.0	1.8	0.0	2.8
Huckle Hill Rd.VT Ln	ID#63	15.5	0.8	14.6	0.9	0.9	1.5	17.4	0.8	14.7	2.7	2.7	1.6	18.3	0.8	15.3	3.0	3.0	1.5	17.8	1.0	14.6	3.2	3.2	1.9	9.8	3.3
Route 5/Wolosko Rd	ID#69	15.6	0.7	14.6	1.0	1.0	1.3	17.1	1.4	14.7	2.4	2.4	2.7	18.4	0.8	15.3	3.1	3.1	1.6	16.7	1.2	14.6	2.1	2.1	2.3	8.5	4.1
Rt 5/Andrews Cmtry	ID#70	14.4	0.8	14.6	-0.2	0.0	1.5	14.9	0.9	14.7	0.2	0.2	1.8	16.0	1.0	15.3	0.7	0.7	2.0	15.5	0.9	14.6	0.9	0.9	1.8	1.8	3.6
Rt 5/Tkaczyk Frm Rd	ID#71	15.3	0.8	14.6	0.7	0.7	1.6	14.9	1.3	14.7	0.2	0.2	2.5	15.4	0.7	15.3	0.1	0.1	1.4	15.6	0.8	14.6	1.0	1.0	1.5	1.9	3.6
Tyler Rd/Franklin Rd	ID#55	14.6	0.7	14.6	0.0	0.0	1.4	15.8	0.8	14.7	1.0	1.0	1.5	16.9	0.9	15.3	1.6	1.6	1.8	15.3	1.7	14.6	0.7	0.7	3.3	3.4	4.3
D&E Tree/Rt 5-Glfrd	ID#42	13.4	0.6	14.6	-1.2	0.0	1.2	13.2	0.9	14.7	-1.5	0.0	1.8	14.2	0.8	15.3	-1.1	0.0	1.5	14.1	0.7	14.6	-0.4	0.0	1.3	0.0	2.9
Rt 5/Guilford Ctr Rd	ID#53	14.6	0.5	14.6	0.0	0.0	1.0	14.2	0.8	14.7	-0.5	0.0	1.5	14.6	0.9	15.3	-0.7	0.0	1.8	14.8	0.7	14.6	0.3	0.3	1.4	0.3	2.9
Glfrd Ctr Rd/Tater Rd	ID#45	14.6	0.6	14.6	0.0	0.0	1.2	14.7	1.7	14.7	0.0	0.0	3.4	15.2	1.0	15.3	-0.2	0.0	1.9	14.8	0.9	14.6	0.3	0.3	1.7	0.3	4.4
Weatherhead Hll Rd	ID#57	13.2	0.6	14.6	-1.4	0.0	1.2	13.3	0.8	14.7	-1.5	0.0	1.5	13.8	0.9	15.3	-1.6	0.0	1.8	14.1	0.8	14.6	-0.5	0.0	1.6	0.0	3.1
Guilford Twn Garage	ID#46	15.6	0.8	14.6	1.0	1.0	1.6	15.7	0.6	14.7	1.0	1.0	1.2	15.8	0.8	15.3	0.5	0.5	1.6	16.2	0.8	14.6	1.6	1.6	1.5	4.1	3.0
West Brattleboro SP	ID#41	12.9	0.5	14.6	-1.7	0.0	1.0	12.9	0.8	14.7	-1.8	0.0	1.5	13.9	0.9	15.3	-1.5	0.0	1.7	13.3	0.6	14.6	-1.3	0.0	1.1	0.0	2.8
Wilmingtn AOT Pole	ID#58	14.5	0.7	14.6	-0.1	0.0	1.3	14.7	1.0	14.7	-0.1	0.0	1.9	15.5	0.8	15.3	0.1	0.1	1.6	16.2	0.7	14.6	1.6	1.6	1.4	1.8	3.1
Wilmington AOT A/S	ID#59	16.5	0.7	14.6	1.9	1.9	1.4	17.6	0.8	14.7	2.9	2.9	1.6	17.9	0.6	15.3	2.6	2.6	1.2	18.4	0.9	14.6	3.8	3.8	1.7	11.3	2.9
Average Background		**14.6**						**14.7**						**15.3**						**14.6**				**14.8**			

Continuous Flow Air Sampling Results

The Health Department uses nine continuously operating air samplers to monitor the air near Vermont Yankee. They are located in Vernon, Guilford, Brattleboro, Dummerston and Wilmington. The locations of the air samplers are shown on Map 6.

Air filters are tested monthly for alpha- and beta-emitting materials and are grouped quarterly to test for gamma-emitting materials. Air cartridges are tested monthly for iodine-131 (I-131) and other gamma-emitting materials. A mechanical problem at the Dummerston site did not allow for a November 2010 sample to be collected. All other samples were collected monthly. These samples are tested by the Health Department Laboratory.

For 2010:

- 98 air cartridges were tested for iodine-131 and gamma-emitting materials.
- 98 air filters were tested for total alpha and beta radioactivity.
- 4 sets of air filters were grouped and tested for gamma-emitting materials.

Air Filter Total Alpha and Beta Radioactivity Results

In 2010, the results for total alpha radioactivity ranged from 0.000307 to 0.00431 picocuries per cubic meter (pCi/m^3). The 2010 results for total beta radioactivity ranged from 0.00164 to 0.01720 pCi/m^3. The historical range for total alpha radioactivity is from the lower limit of detection to 0.0071 pCi/m^3. The historical range for total beta radioactivity is from the lower limit of detection to 0.0271 pCi/m^3. The 2010 total alpha and beta radioactivity air filter results are presented in Table 12.

Figures 2 and 3 show the average total alpha and beta radioactivity for each of the nine sample locations compared to the 2009 results. Very low results that were uncertain because of noted collection problems were removed prior to calculating the average result. This is a conservative approach and will result in an increased average result calculated.

Air Cartridge and Air Filter Gamma-Emitting Materials Results

No iodine-131 above the lower limit of detection was identified at any of the nine air sampling stations. The calculated lower limit of detection for iodine-131 is 0.0009 pCi/m^3. Only naturally-occurring radioactive materials were identified. Table 13 presents the monthly results of iodine-131 sample analysis and gamma spectroscopy analysis on the air cartridges.

Quarterly air filter samples from all nine air sample locations grouped together ("composited") and tested measured only naturally-occurring beryllium-7. Table 14 presents the quarterly composite results.

In 2010, no alpha, beta or gamma radioactivity related to the operations of Vermont Yankee was identified in the continuous flow air samples.

Map 6

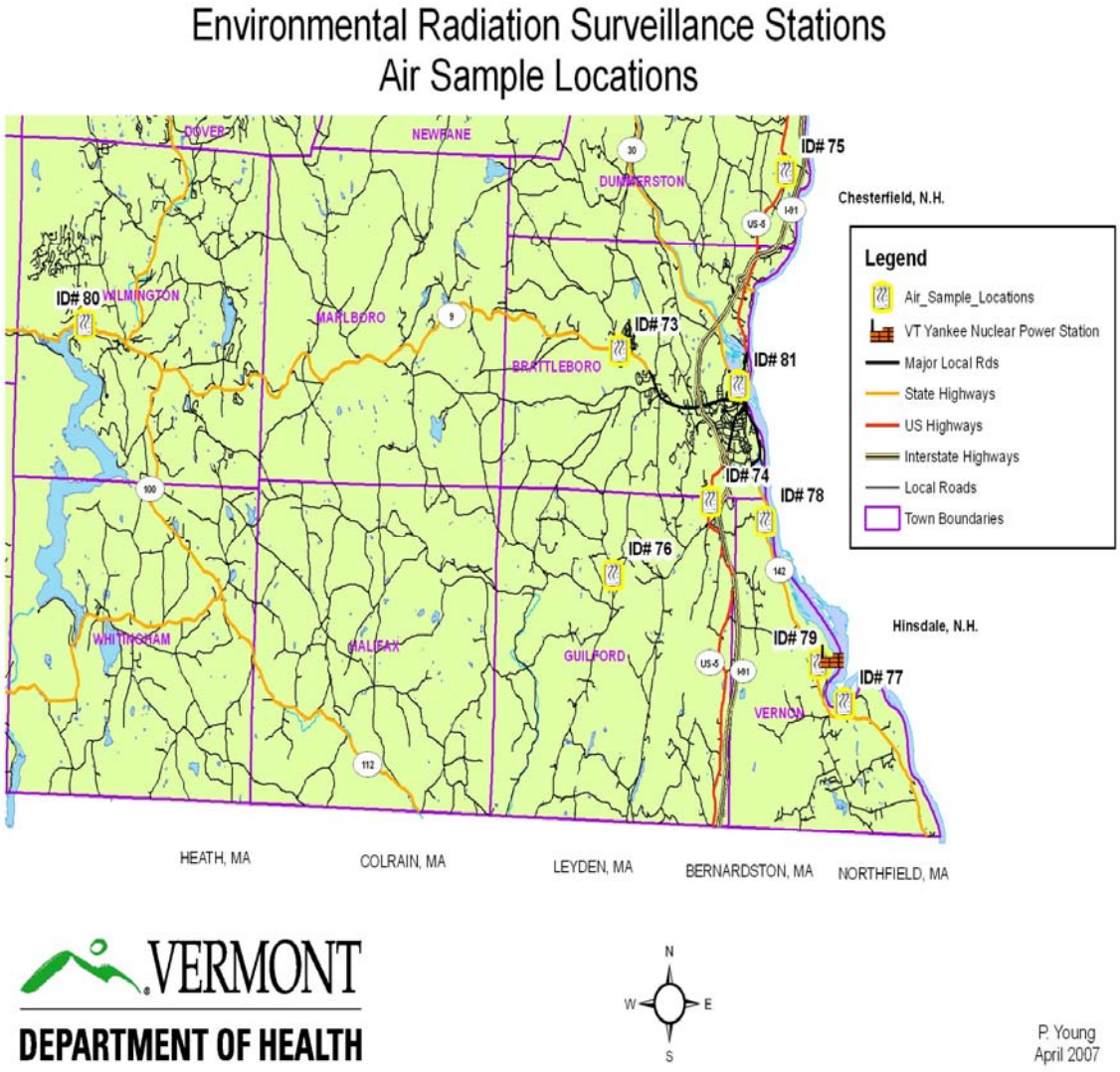

Environmental Radiation Surveillance Stations
Air Sample Locations
DOVER
NEWFANE
DUMMERSTON
ID# 75
Chesterfield, N.H.
ID# 80
WILMINGTON
MARLBORO
ID# 73
BRATTLEBORO
ID# 81
ID# 74
ID# 78
ID# 76
WHITINGHAM
MALIFAX
GUILFORD
Hinsdale, N.H.
ID# 79
ID# 77
VERNON
Legend
Air_Sample_Locations
VT Yankee Nuclear Power Station
Major Local Rds
State Highways
US Highways
Interstate Highways
Local Roads
Town Boundaries
HEATH, MA
COLRAIN, MA
LEYDEN, MA
BERNARDSTON, MA
NORTHFIELD, MA
VERMONT
DEPARTMENT OF HEALTH
N
W
E
S
P. Young
April 2007

Table 12. 2010 Air Filter Results for Total Alpha and Beta Radioactivity

Date of Sample	Sample Location	Map ID	Total Alpha Radioactivity +/- error (pCi/m^3)	Total Beta Radioactivity +/- error (pCi/m^3)
02/02/10	Vermont State Police-Brattleboro	73	0.00037 +/- 0.00036	0.00180 +/- 0.00053
02/02/10	D & E Tree	74	0.00225 +/- 0.00065	0.01040 +/- 0.00100
02/02/10	Dummerston State Highway Garage	75	0.00041 +/- 0.00037	0.00137 +/- 0.00049
02/02/10	Guilford Town Garage	76	0.00049 +/- 0.00044	0.00261 +/- 0.00067
02/02/10	Power Line River Crossing	77	0.00288 +/- 0.00072	0.01340 +/- 0.00120
02/02/10	Renaud Brothers	78	0.00355 +/- 0.00083	0.01360 +/- 0.00120
02/02/10	Vernon Elementary School	79	0.00218 +/- 0.00063	0.01050 +/- 0.00100
02/02/10	Wilmington State Highway Garage	80	0.00111 +/- 0.00047	0.00417 +/- 0.00068
02/02/10	Windham County Court	81	0.00007 +/- 0.00027	0.00110 +/- 0.00043
03/15/10	Vermont State Police-Brattleboro	73	0.00178 +/- 0.00054	0.00721 +/- 0.00084
03/15/10	D & E Tree	74	0.00035 +/- 0.00031	0.00061 +/- 0.00043
03/15/10	Dummerston State Highway Garage	75	0.00033 +/- 0.00029	0.00051 +/- 0.00040
03/15/10	Guilford Town Garage	76	0.00226 +/- 0.00065	0.00872 +/- 0.00101
03/15/10	Power Line River Crossing	77	0.00207 +/- 0.00058	0.00894 +/- 0.00094
03/15/10	Renaud Brothers	78	0.00187 +/- 0.00058	0.00705 +/- 0.00088
03/15/10	Vernon Elementary School	79	0.00171 +/- 0.00052	0.00725 +/- 0.00084
03/15/10	Wilmington State Highway Garage	80	0.00160 +/- 0.00050	0.00638 +/- 0.00078
03/15/10	Windham County Court	81	0.00019 +/- 0.00025	0.00050 +/- 0.00039
04/13/10	Wilmington State Highway Garage	80	0.00303 +/- 0.00084	0.00951 +/- 0.00117
04/19/10	Vermont State Police-Brattleboro	73	0.00053 +/- 0.00044	0.00287 +/- 0.00072
04/19/10	D & E Tree	74	0.00033 +/- 0.00040	0.00071 +/- 0.00056
04/19/10	Dummerston State Highway Garage	75	0.00041 +/- 0.00040	0.00099 +/- 0.00057
04/19/10	Guilford Town Garage	76	0.00027 +/- 0.00042	0.00057 +/- 0.00061
04/19/10	Power Line River Crossing	77	0.00127 +/- 0.00056	0.00271 +/- 0.00072
04/19/10	Renaud Brothers	78	0.00284 +/- 0.00078	0.00962 +/- 0.00112
04/19/10	Vernon Elementary School	79	0.00276 +/- 0.00074	0.00818 +/- 0.00102
04/19/10	Windham County Court	81	0.00028 +/- 0.00037	0.00070 +/- 0.00054
05/20/10	Wilmington State Highway Garage	80	0.00271 +/- 0.00071	0.00903 +/- 0.00099
05/25/10	Vermont State Police-Brattleboro	73	0.00041 +/- 0.00041	0.00143 +/- 0.00057
05/25/10	D & E Tree	74	0.00005 +/- 0.00033	0.00081 +/- 0.00051
05/25/10	Dummerston State Highway Garage	75	0.00045 +/- 0.00042	0.00100 +/- 0.00053
05/25/10	Guilford Town Garage	76	0.00431 +/- 0.00094	0.01330 +/- 0.00130
05/25/10	Power Line River Crossing	77	0.00251 +/- 0.00073	0.01120 +/- 0.00120
05/25/10	Renaud Brothers	78	0.00170 +/- 0.00063	0.00849 +/- 0.00103
05/25/10	Vernon Elementary School	79	-0.00004 +/- 0.00031	0.00071 +/- 0.00050
05/25/10	Windham County Court	81	0.00020 +/- 0.00035	0.00108 +/- 0.00052

Table 12. 2010 Air Filter Results for Total Alpha and Beta Radioactivity (continued)

Date of Sample	Sample Location	Map ID	Total Alpha Radioactivity +/- error (pCi/m^3)	Total Beta Radioactivity +/- error (pCi/m^3)
06/22/10	Vermont State Police-Brattleboro	73	0.00360 +/- 0.00091	0.01000 +/- 0.00130
06/22/10	D & E Tree	74	0.00240 +/- 0.00077	0.01040 +/- 0.00140
06/22/10	Dummerston State Highway Garage	75	0.00266 +/- 0.00078	0.01070 +/- 0.00130
06/22/10	Guilford Town Garage	76	0.00399 +/- 0.00099	0.01070 +/- 0.00140
06/22/10	Power Line River Crossing	77	0.00125 +/- 0.00059	0.00448 +/- 0.00102
06/22/10	Renaud Brothers	78	0.00223 +/- 0.00072	0.00705 +/- 0.00112
06/22/10	Vernon Elementary School	79	0.00244 +/- 0.00077	0.00894 +/- 0.00127
06/22/10	Wilmington State Highway Garage	80	0.00025 +/- 0.00029	0.00066 +/- 0.00056
06/22/10	Windham County Court	81	0.00231 +/- 0.00073	0.00834 +/- 0.00118
07/15/10	Wilmington State Highway Garage	80	0.00031 +/- 0.00092	0.01550 +/- 0.00170
07/20/10	Vermont State Police-Brattleboro	73	0.00274 +/- 0.00082	0.01420 +/- 0.00150
07/20/10	D & E Tree	74	0.00228 +/- 0.00077	0.00887 +/- 0.00124
07/20/10	Dummerston State Highway Garage	75	0.00323 +/- 0.00089	0.01630 +/- 0.00160
07/20/10	Guilford Town Garage	76	0.00338 +/- 0.00091	0.01720 +/- 0.00160
07/20/10	Power Line River Crossing	77	0.00300 +/- 0.00087	0.01600 +/- 0.00160
07/20/10	Renaud Brothers	78	0.00258 +/- 0.00121	0.01260 +/- 0.00220
07/20/10	Vernon Elementary School	79	0.00225 +/- 0.00076	0.01100 +/- 0.00130
07/20/10	Windham County Court	81	0.00339 +/- 0.00089	0.01240 +/- 0.00140
08/19/10	Wilmington State Highway Garage	80	0.00261 +/- 0.00071	0.01300 +/- 0.00120
08/24/10	Vermont State Police-Brattleboro	73	0.00034 +/- 0.00041	0.00136 +/- 0.00063
08/24/10	D & E Tree	74	-0.00004 +/- 0.00033	0.00031 +/- 0.00056
08/24/10	Dummerston State Highway Garage	75	0.00241 +/- 0.00072	0.01340 +/- 0.00130
08/24/10	Guilford Town Garage	76	0.00302 +/- 0.00080	0.01520 +/- 0.00140
08/24/10	Power Line River Crossing	77	0.00254 +/- 0.00074	0.01280 +/- 0.00130
08/24/10	Renaud Brothers	78	0.00214 +/- 0.00067	0.01120 +/- 0.00120
08/24/10	Vernon Elementary School	79	0.00057 +/- 0.00046	0.00164 +/- 0.00068
08/24/10	Windham County Court	81	0.00211 +/- 0.00068	0.01350 +/- 0.00130
09/16/10	Wilmington State Highway Garage	80	0.00330 +/- 0.00088	0.01340 +/- 0.00130
09/21/10	Vermont State Police-Brattleboro	73	0.00279 +/- 0.00087	0.01390 +/- 0.00140
09/21/10	D & E Tree	74	-0.00021 +/- 0.00037	0.00063 +/- 0.00061
09/21/10	Dummerston State Highway Garage	75	0.00343 +/- 0.00094	0.01600 +/- 0.00150
09/21/10	Guilford Town Garage	76	0.00344 +/- 0.00097	0.01550 +/- 0.00150
09/21/10	Power Line River Crossing	77	0.00361 +/- 0.00097	0.01470 +/- 0.00150
09/21/10	Renaud Brothers	78	0.00286 +/- 0.00088	0.01400 +/- 0.00140
09/21/10	Vernon Elementary School	79	-0.00005 +/- 0.00042	0.00015 +/- 0.00056
09/22/10	Windham County Court	81	0.00346 +/- 0.00092	0.01530 +/- 0.00140

Table 12. 2010 Air Filter Results for Total Alpha and Beta Radioactivity (continued)

Date of Sample	Sample Location	Map ID	Total Alpha Radioactivity +/- error (pCi/m^3)	Total Beta Radioactivity +/- error (pCi/m^3)
10/14/10	Wilmington State Highway Garage	80	0.00205 +/- 0.00070	0.01020 +/- 0.00120
10/19/10	Vermont State Police-Brattleboro	73	0.00146 +/- 0.00065	0.00609 +/- 0.00105
10/19/10	D & E Tree	74	0.00041 +/- 0.00046	0.00231 +/- 0.00082
10/19/10	Dummerston State Highway Garage	75	0.00223 +/- 0.00076	0.01160 +/- 0.00130
10/19/10	Guilford Town Garage	76	0.00234 +/- 0.00081	0.01090 +/- 0.00140
10/19/10	Power Line River Crossing	77	0.00095 +/- 0.00056	0.00552 +/- 0.00101
10/19/10	Renaud Brothers	78	0.00190 +/- 0.00073	0.00849 +/- 0.00122
10/19/10	Vernon Elementary School	79	0.00042 +/- 0.00048	0.00333 +/- 0.00092
10/19/10	Windham County Court	81	0.00138 +/- 0.00064	0.00938 +/- 0.00124
11/12/10	Windham County Court	81	0.00203 +/- 0.00077	0.01050 +/- 0.00140
11/18/10	Wilmington State Highway Garage	80	0.00059 +/- 0.00038	0.00302 +/- 0.00067
11/22/10	Vermont State Police-Brattleboro	73	0.00128 +/- 0.00053	0.00831 +/- 0.00104
11/22/10	D & E Tree	74	-0.00020 +/- 0.00023	0.00006 +/- 0.00052
11/22/10	Guilford Town Garage	76	0.00271 +/- 0.00077	0.01100 +/- 0.00130
11/22/10	Power Line River Crossing	77	0.00111 +/- 0.00050	0.00502 +/- 0.00086
11/22/10	Renaud Brothers	78	0.00151 +/- 0.00061	0.00964 +/- 0.00117
11/22/10	Vernon Elementary School	79	0.00090 +/- 0.00048	0.00444 +/- 0.00084
12/21/10	Vermont State Police-Brattleboro	73	0.00264 +/- 0.00078	0.01300 +/- 0.00130
12/21/10	D & E Tree	74	0.00249 +/- 0.00077	0.01310 +/- 0.00130
12/21/10	Dummerston State Highway Garage	75	0.00337 +/- 0.00087	0.01450 +/- 0.00140
12/21/10	Guilford Town Garage	76	0.00361 +/- 0.00097	0.01610 +/- 0.00150
12/21/10	Power Line River Crossing	77	0.00357 +/- 0.00089	0.01310 +/- 0.00130
12/21/10	Renaud Brothers	78	0.00210 +/- 0.00073	0.01130 +/- 0.00130
12/21/10	Vernon Elementary School	79	0.00280 +/- 0.00079	0.01450 +/- 0.00130
12/21/10	Windham County Court	81	0.00242 +/- 0.00074	0.01300 +/- 0.00130
12/22/10	Wilmington State Highway Garage	80	0.00253 +/- 0.00066	0.01150 +/- 0.00110

Figure 2. 2009 and 2010 Comparative Average Alpha Radioactivity in Air

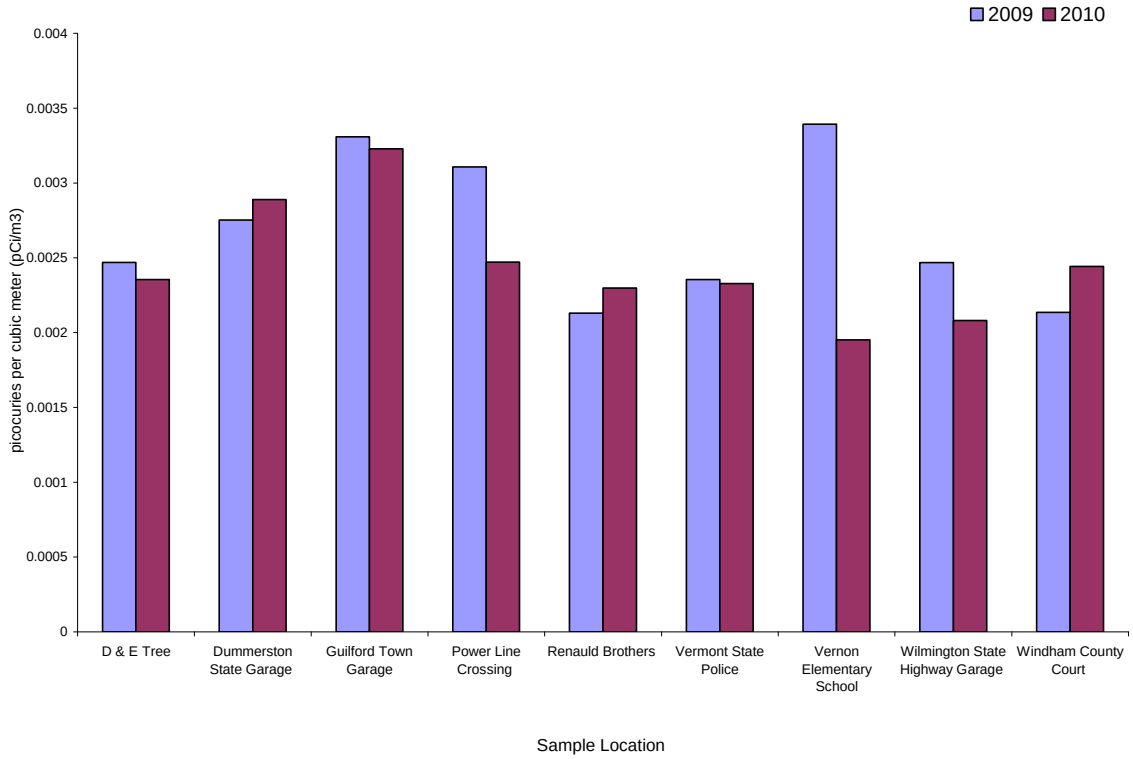


Figure 3. 2009 and 2010 Comparative Average Beta Radioactivity in Air

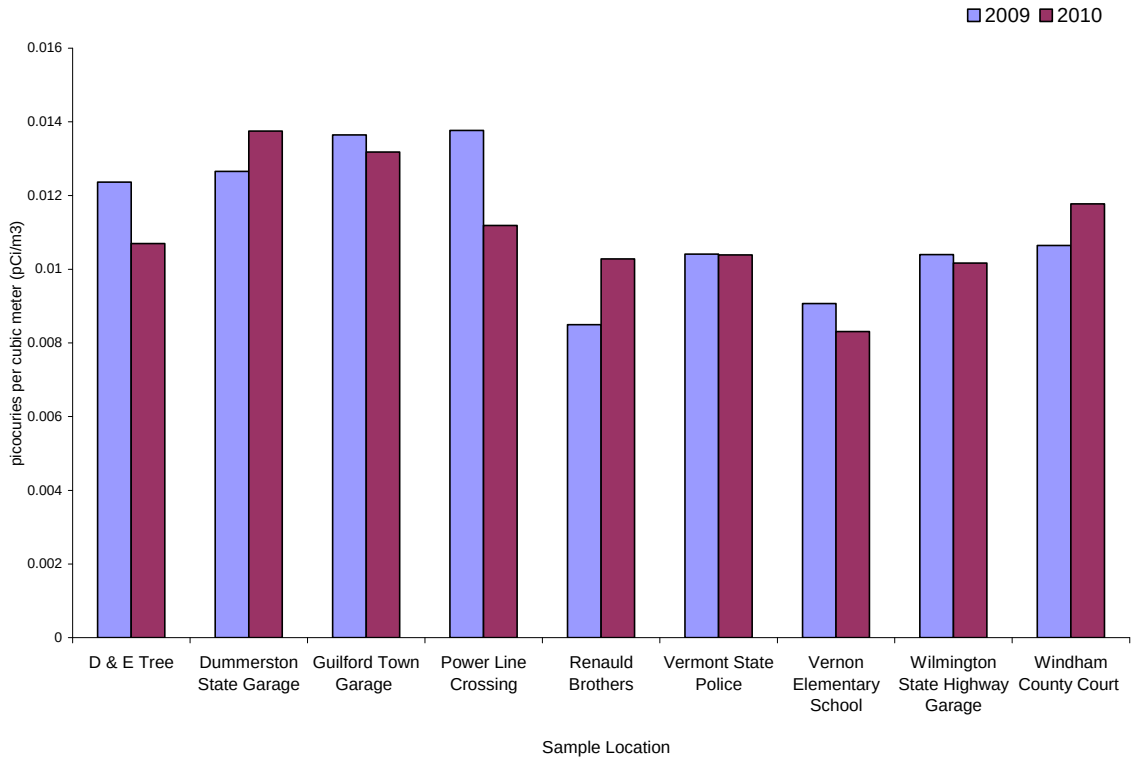


Table 13. 2010 Air Cartridge Results for Iodine-131 & Gamma Spectroscopy

Date of Sample	Sample Location	Map ID	Sample Volume (m^3)	Iodine-131 Result	Gamma Spectrometry Result
02/02/10	Vermont State Police-Brattleboro	73	2085.5	<LLD	Natural
02/02/10	D & E Tree	74	2033.6	<LLD	Natural
02/02/10	Dummerston State Highway Garage	75	2091.7	<LLD	Natural
02/02/10	Guilford Town Garage	76	1754.3	<LLD	Natural
02/02/10	Power Line River Crossing	77	2040.9	<LLD	Natural
02/02/10	Renaud Brothers	78	1847.7	<LLD	Natural
02/02/10	Vernon Elementary School	79	2097.8	<LLD	Natural
02/02/10	Wilmington State Highway Garage	80	2227.1	<LLD	Natural
02/02/10	Windham County Court	81	2285.2	<LLD	Natural
03/15/10	Vermont State Police-Brattleboro	73	2339.5	<LLD	Natural
03/15/10	D & E Tree	74	2318.2	<LLD	Natural
03/15/10	Dummerston State Highway Garage	75	2468.3	<LLD	Natural
03/15/10	Guilford Town Garage	76	1982.9	<LLD	Natural
03/15/10	Power Line River Crossing	77	2279.9	<LLD	Natural
03/15/10	Renaud Brothers	78	2140.6	<LLD	Natural
03/15/10	Vernon Elementary School	79	2377.1	<LLD	Natural
03/15/10	Wilmington State Highway Garage	80	2459.8	<LLD	Natural
03/15/10	Windham County Court	81	2549.0	<LLD	Natural
04/13/10	Wilmington State Highway Garage	80	1718.3	<LLD	Natural
04/19/10	Vermont State Police-Brattleboro	73	1975.7	<LLD	Natural
04/19/10	D & E Tree	74	1964.9	<LLD	Natural
04/19/10	Dummerston State Highway Garage	75	2014.7	<LLD	Natural
04/19/10	Guilford Town Garage	76	1757.7	<LLD	Natural
04/19/10	Power Line River Crossing	77	1951.7	<LLD	Natural
04/19/10	Renaud Brothers	78	1858.2	<LLD	Natural
04/19/10	Vernon Elementary School	79	1975.3	<LLD	Natural
04/19/10	Windham County Court	81	2052.5	<LLD	Natural
05/20/10	Wilmington State Highway Garage	80	2150.0	<LLD	Natural
05/25/10	Vermont State Police-Brattleboro	73	2013.6	<LLD	Natural
05/25/10	D & E Tree	74	2002.1	<LLD	Natural
05/25/10	Dummerston State Highway Garage	75	2018.1	<LLD	Natural
05/25/10	Guilford Town Garage	76	1829.3	<LLD	Natural
05/25/10	Power Line River Crossing	77	1937.7	<LLD	Natural
05/25/10	Renaud Brothers	78	1918.9	<LLD	Natural
05/25/10	Vernon Elementary School	79	2011.2	<LLD	Natural
05/25/10	Windham County Court	81	2096.2	<LLD	Natural

Table 13. 2010 Air Cartridge Results for Iodine-131 & Gamma Spectroscopy (continued)

Date of Sample	Sample Location	Map ID	Sample Volume (m^3)	Iodine-131 Result	Gamma Spectrometry Result
06/22/10	Vermont State Police-Brattleboro	73	1469.0	<LLD	Natural
06/22/10	D & E Tree	74	1427.5	<LLD	Natural
06/22/10	Dummerston State Highway Garage	75	1522.7	<LLD	Natural
06/22/10	Guilford Town Garage	76	1384.7	<LLD	Natural
06/22/10	Power Line River Crossing	77	1422.8	<LLD	Natural
06/22/10	Renaud Brothers	78	1530.3	<LLD	Natural
06/22/10	Vernon Elementary School	79	1441.9	<LLD	Natural
06/22/10	Wilmington State Highway Garage	80	1849.6	<LLD	Natural
06/22/10	Windham County Court	81	1550.9	<LLD	Natural
07/15/10	Wilmington State Highway Garage	80	1328.7	<LLD	Natural
07/20/10	Vermont State Police-Brattleboro	73	1489.8	<LLD	Natural
07/20/10	D & E Tree	74	1474.4	<LLD	Natural
07/20/10	Dummerston State Highway Garage	75	1487.8	<LLD	Natural
07/20/10	Guilford Town Garage	76	1468.9	<LLD	Natural
07/20/10	Power Line River Crossing	77	1462.5	<LLD	Natural
07/20/10	Renaud Brothers	78	742.9	<LLD	Natural
07/20/10	Vernon Elementary School	79	1491.8	<LLD	Natural
07/20/10	Windham County Court	81	1537.9	<LLD	Natural
08/19/10	Wilmington State Highway Garage	80	2009.4	<LLD	Natural
08/24/10	Vermont State Police-Brattleboro	73	1903.6	<LLD	Natural
08/24/10	D & E Tree	74	1868.0	<LLD	Natural
08/24/10	Dummerston State Highway Garage	75	1875.6	<LLD	Natural
08/24/10	Guilford Town Garage	76	1837.2	<LLD	Natural
08/24/10	Power Line River Crossing	77	1843.4	<LLD	Natural
08/24/10	Renaud Brothers	78	1938.9	<LLD	Natural
08/24/10	Vernon Elementary School	79	1836.6	<LLD	Natural
08/24/10	Windham County Court	81	1917.0	<LLD	Natural
09/16/10	Wilmington State Highway Garage	80	1657.3	<LLD	Natural
09/21/10	Vermont State Police-Brattleboro	73	1512.3	<LLD	Natural
09/21/10	D & E Tree	74	1476.1	<LLD	Natural
09/21/10	Dummerston State Highway Garage	75	1528.1	<LLD	Natural
09/21/10	Guilford Town Garage	76	1451.1	<LLD	Natural
09/21/10	Power Line River Crossing	77	1495.8	<LLD	Natural
09/21/10	Renaud Brothers	78	1498.7	<LLD	Natural
09/21/10	Vernon Elementary School	79	1465.0	<LLD	Natural
09/22/10	Windham County Court	81	1600.6	<LLD	Natural

Table 13. 2010 Air Cartridge Results for Iodine-131 & Gamma Spectroscopy (continued)

Date of Sample	Sample Location	Map ID	Sample Volume (m^3)	Iodine-131 Result	Gamma Spectrometry Result
10/14/10	Wilmington State Highway Garage	80	1667.5	<LLD	Natural
10/19/10	Vermont State Police-Brattleboro	73	1534.9	<LLD	Natural
10/19/10	D & E Tree	74	1494.7	<LLD	Natural
10/19/10	Dummerston State Highway Garage	75	1534.1	<LLD	Natural
10/19/10	Guilford Town Garage	76	1426.4	<LLD	Natural
10/19/10	Power Line River Crossing	77	1552.9	<LLD	Natural
10/19/10	Renaud Brothers	78	1473.3	<LLD	Natural
10/19/10	Vernon Elementary School	79	1438.0	<LLD	Natural
10/19/10	Windham County Court	81	1525.1	<LLD	Natural
11/12/10	Windham County Court	81	1395.1	<LLD	Natural
11/18/10	Wilmington State Highway Garage	80	2191.0	<LLD	Natural
11/22/10	Vermont State Police-Brattleboro	73	1909.2	<LLD	Natural
11/22/10	D & E Tree	74	1823.5	<LLD	Natural
11/22/10	Guilford Town Garage	76	1701.5	<LLD	Natural
11/22/10	Power Line River Crossing	77	1930.2	<LLD	Natural
11/22/10	Renaud Brothers	78	1719.3	<LLD	Natural
11/22/10	Vernon Elementary School	79	1869.0	<LLD	Natural
12/21/10	Vermont State Police-Brattleboro	73	1640.3	<LLD	Natural
12/21/10	D & E Tree	74	1616.8	<LLD	Natural
12/21/10	Dummerston State Highway Garage	75	1624.7	<LLD	Natural
12/21/10	Guilford Town Garage	76	1430.0	<LLD	Natural
12/21/10	Power Line River Crossing	77	1641.7	<LLD	Natural
12/21/10	Renaud Brothers	78	1574.2	<LLD	Natural
12/21/10	Vernon Elementary School	79	1694.0	<LLD	Natural
12/21/10	Windham County Court	81	1695.3	<LLD	Natural
12/22/10	Wilmington State Highway Garage	80	2130.1	<LLD	Natural

< LLD = Less than the Laboratory's Lower Level of Detection

Natural = gamma-emitting materials measured are not related to operation of nuclear power reactors

Table 14. 2010 Air Filter Quarterly Composite Results (Gamma Spectroscopy)

Quarter	Last Date of Quarter	Element	Concentration +/- error (pCi)		
1st Quarter	03/31/10	Beryllium-7	3050	+/-	370
2nd Quarter	06/30/10	Beryllium-7	4920	+/-	620
3rd Quarter	09/30/10	Beryllium-7	5420	+/-	550
4th Quarter	12/31/10	Beryllium-7	4020	+/-	420

Water Sampling Results

The Health Department has routinely collected off-site monthly water samples from six locations around Vermont Yankee. These routine water samples are tested for tritium, gamma-emitting materials, and total alpha and beta radioactivity. Collections are taken from drinking water wells (3), a public water supply (1) and the Connecticut River (2). These sample locations are shown on Map 7.

In addition, Vermont Yankee routinely collected at four Connecticut River sites monthly, stations 3-3, 3-4, 3-8 and the Discharge Forebay. These sample locations are shown in Map 8.

All routine sites and analyses continued in 2010. However, as a result of the detection of tritium in the groundwater monitoring wells at Vermont Yankee, three additional private drinking water wells and a nursing home, all located near Vermont Yankee, were added to the Health Department's 2010 off-site water sampling program. Sampling frequency at all off-site locations was increased in 2010 as a result of the tritium detection.

The tritium contamination of a groundwater well at Vermont Yankee was confirmed by the Health Department. Beginning in January 2010, as part of the investigation, Vermont Yankee installed and sampled 29 new on-site groundwater monitoring wells, sampled on-site drinking water supplies, and added an additional site in the Connecticut River next to where the plume was projected to enter the river. These on-site water sample sites are shown on Map 9. The Health Department received weekly field duplicate water samples of these tritium-related monitoring sites. Additional routine on-site water samples were also collected in 2010.

The location of the leak to the environment was identified in mid-February 2010 near the Advanced Off-Gas Building, which is located close to GZ-10 as shown on Map 9. Vermont Yankee officials stated that the leak was stopped on March 25, 2010. An additional leak also in the Advanced Off Gas area was identified in May 2010. This leak

was stopped. The tritium that leaked created a plume of contaminated groundwater that was tracked throughout 2010 and 2011.

Routine off-site water samples are tested for total alpha and beta radioactivity, gamma radioactivity and tritium. Water samples that were collected as a result of the tritium leak were tested by the Health Department for tritium and gamma-emitting materials. Other analyses were performed by contract laboratories.

For 2010:

- 118 routine water samples were tested for total alpha and beta radioactivity, tritium and gamma-emitting materials.
- 16 routine groundwater samples were tested for tritium and gamma-emitting materials.
- 997 non-routine water (ground, drinking, surface) samples were tested for tritium and of those, 759 were also tested for gamma-emitting materials.
- 169 water samples were tested for hard-to-detect elements: iron-55, nickel-63, strontium-89, and strontium-90.

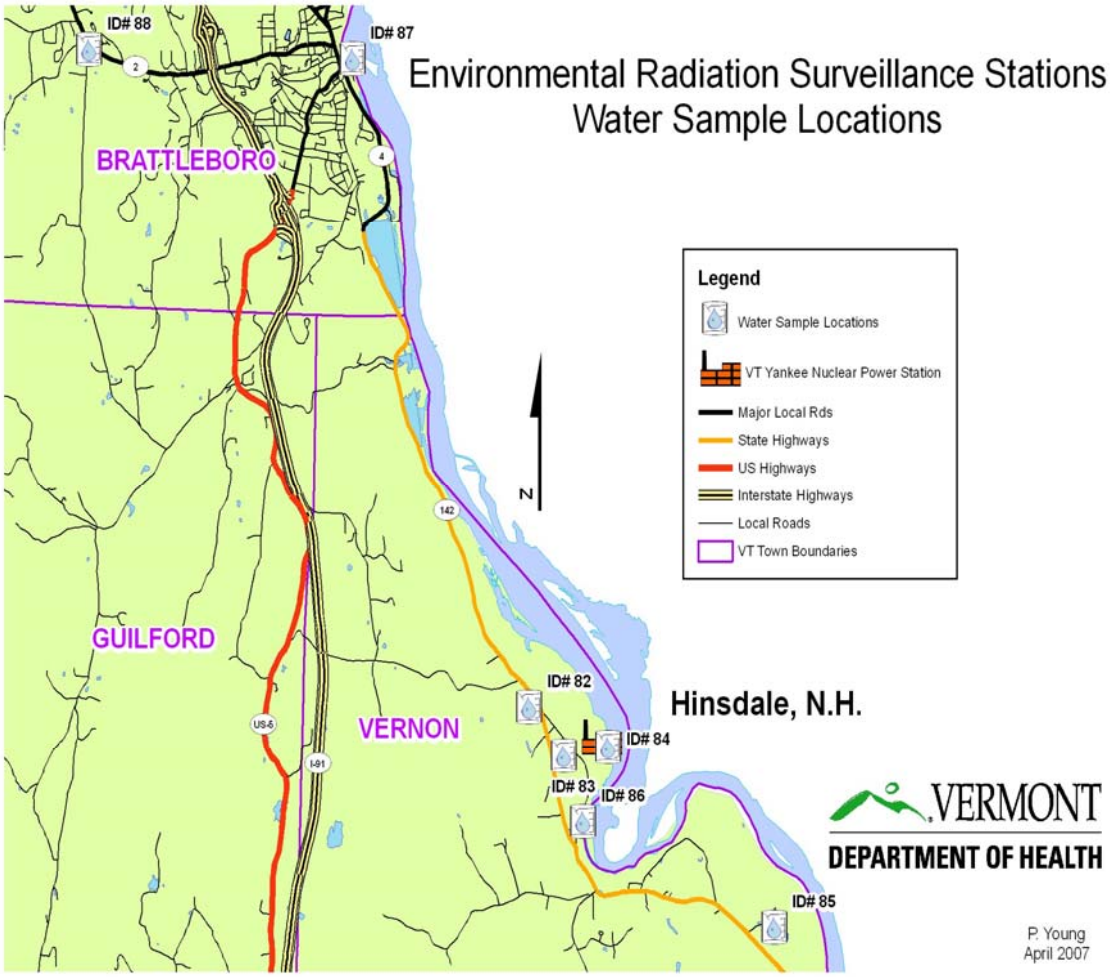
Due to the large number of results associated with tritium, gamma spectroscopy, and hard-to-detect analyses, the individual data for these tests are presented in Appendices A, B and C. Summaries of each well sampled with tritium results are presented in this section. Graphs of tritium concentration trends in contaminated wells are also presented.

Water Total Alpha and Beta Radioactivity Results

The alpha and beta radioactivity measured in the water samples is within the historical range for both types of radioactivity. Water alpha and beta radioactivity measurements around Vermont Yankee have both historically ranged from below the lower limit of detection to 15 picocuries per liter (pCi/L). The 2010 range for alpha radioactivity is from -1.83 to 7.90 pCi/L. The 2010 range for beta radioactivity is from -1.97 to 8.24 pCi/L. Results from 2010 are presented in Table 15. Comparisons of 2009 and 2010 data are

presented in figures 4 and 5. Trends for both alpha and beta results are similar to past years: Vernon Elementary School and Blodgett Farm have always had higher levels of natural radioactivity in the water.

Map 7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ID# 87
BRATTLEBORO
GUILFORD
VERNON
ID# 82
ID# 84
ID# 83
ID# 86
ID# 85
Hinsdale, N.H.
N
Legend
Water Sample Locations
VT Yankee Nuclear Power Station
Major Local Rds
State Highways
US Highways
Interstate Highways
Local Roads
VT Town Boundaries
VERMONT
DEPARTMENT OF HEALTH
P. Young
April 2007

Map 8

Routine Connecticut River Water Sample Locations

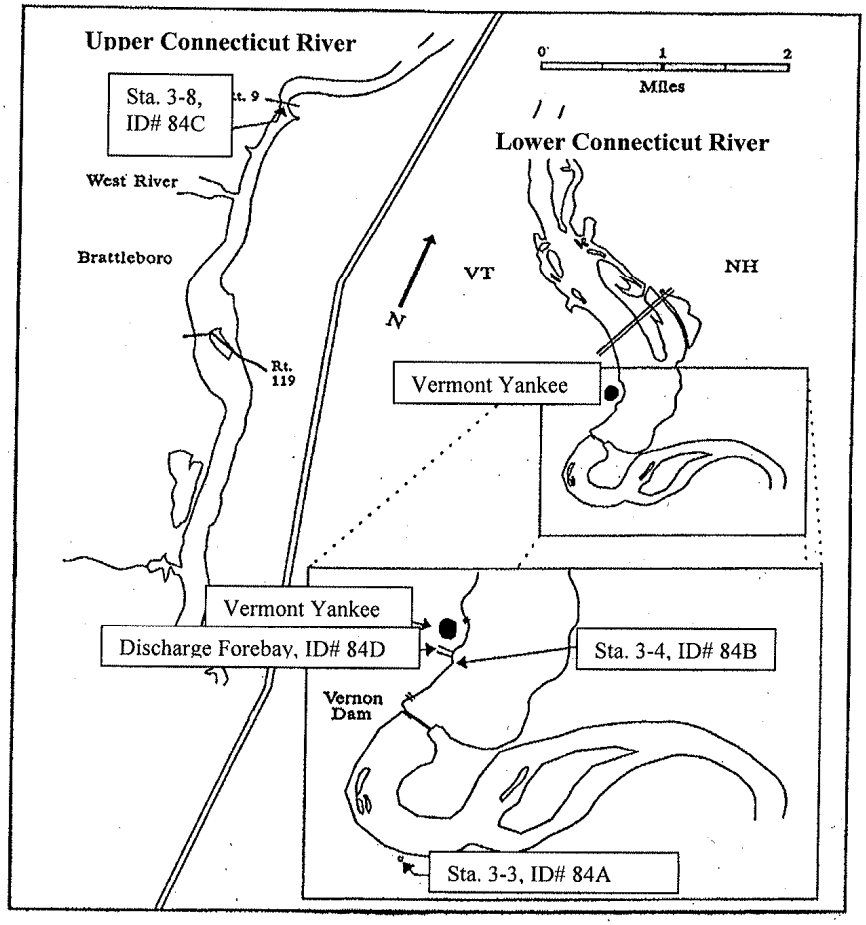


Table 15. 2010 Water Results for Total Alpha and Beta Radioactivity

Date of Sample	Sample Location	Map ID	Total Alpha Radioactivity +/- error (pCi/L)	Total Beta Radioactivity +/- error (pCi/L)
01/13/10	3-3 Connecticut River Station	84A	0.54 +/- 1.31	1.06 +/- 1.88
01/13/10	3-4 Connecticut River Station	84B	0.79 +/- 1.30	0.30 +/- 1.86
01/13/10	3-8 Connecticut River Station	84C	0.28 +/- 0.46	0.40 +/- 0.63
01/13/10	Discharge Forebay	84D	0.52 +/- 1.28	1.06 +/- 1.88
01/08/10	Blodgett Farm	85	5.59 +/- 1.13	4.73 +/- 1.97
01/08/10	Brattleboro Fire Dept, West Station	88	0.30 +/- 0.74	1.88 +/- 0.93
01/08/10	Connecticut River, Downstream	88	1.31 +/- 1.33	1.21 +/- 1.88
01/08/10	Miller Farm	87	0.29 +/- 0.77	3.50 +/- 1.94
01/08/10	Vernon Elementary School	82	7.17 +/- 1.26	3.95 +/- 1.95
02/15/10	3-3 Connecticut River Station	84A	0.27 +/- 1.33	1.51 +/- 1.89
02/15/10	3-4 Connecticut River Station	84B	-0.27 +/- 1.31	0.45 +/- 1.86
02/15/10	3-8 Connecticut River Station	84C	0.48 +/- 1.21	-0.76 +/- 1.83
02/15/10	Discharge Forebay	84D	0.55 +/- 1.37	1.06 +/- 1.88
02/02/10	Blodgett Farm	85	6.73 +/- 1.21	8.24 +/- 2.05
02/02/10	Brattleboro Fire Dept, West Station	88	0.53 +/- 1.33	-1.97 +/- 1.81
02/02/10	Connecticut River, Downstream	88	1.32 +/- 1.38	-1.51 +/- 1.82
02/02/10	Miller Farm	87	0.51 +/- 0.75	2.13 +/- 1.91
02/02/10	Vernon Elementary School	82	6.37 +/- 1.19	3.80 +/- 1.95
03/13/10	3-3 Connecticut River Station	84A	0.53 +/- 1.36	2.54 +/- 1.82
03/13/10	3-4 Connecticut River Station	84B	0.00 +/- 1.46	1.94 +/- 1.8
03/13/10	3-8 Connecticut River Station	84C	0.31 +/- 0.41	0.45 +/- 0.45
03/13/10	Discharge Forebay	84D	-0.57 +/- 1.39	2.54 +/- 1.82
03/15/10	Blodgett Farm	85	4.74 +/- 1.08	6.90 +/- 1.93
03/15/10	Brattleboro Fire Dept, West Station	88	-0.39 +/- 0.63	1.49 +/- 1.79
03/15/10	Connecticut River, Downstream	88	0.79 +/- 1.38	1.49 +/- 1.79
03/15/10	Connecticut River, Upstream	86	0.65 +/- 1.68	0.15 +/- 1.77
03/15/10	Miller Farm	87	0.00 +/- 0.71	3.44 +/- 1.84
03/15/10	Vernon Elementary School	82	6.30 +/- 1.18	5.69 +/- 1.89
04/14/10	3-3 Connecticut River Station	84A	-0.49 +/- 1.32	0.78 +/- 1.87
04/14/10	3-4 Connecticut River Station	84B	0.00 +/- 1.42	-0.93 +/- 1.83
04/14/10	3-8 Connecticut River Station	84C	0.00 +/- 1.45	-0.78 +/- 1.83
04/14/10	Discharge Forebay	84D	0.25 +/- 1.41	-1.87 +/- 1.81
04/19/10	Blodgett Farm	85	4.12 +/- 1.13	4.38 +/- 1.96
04/19/10	Brattleboro Fire Dept, West Station	88	-0.27 +/- 1.49	0.78 +/- 1.87
04/19/10	Connecticut River, Downstream	88	0.30 +/- 0.85	1.32 +/- 0.96
04/19/10	Connecticut River, Upstream	86	0.30 +/- 0.85	1.33 +/- 0.96
04/19/10	Miller Farm	87	0.00 +/- 0.83	2.03 +/- 1.90
04/19/10	Vernon Elementary School	82	6.28 +/- 1.26	3.12 +/- 1.93

Table 15. 2010 Total Alpha and Beta Radioactivity Water Results (continued)

Date of Sample	Sample Location	Map ID	Total Alpha Radioactivity +/- error (pCi/L)	Total Beta Radioactivity +/- error (pCi/L)
05/13/10	3-3 Connecticut River Station	84A	0.60 +/- 0.85	1.40 +/- 0.83
05/13/10	3-4 Connecticut River Station	84B	0.00 +/- 0.79	0.63 +/- 0.81
05/13/10	3-8 Connecticut River Station	84C	0.91 +/- 0.88	2.03 +/- 0.85
05/13/10	Discharge Forebay	84D	0.90 +/- 0.87	1.89 +/- 0.85
05/25/10	Blodgett Farm	85	5.17 +/- 1.14	5.61 +/- 1.75
05/25/10	Brattleboro Fire Dept, West Station	88	0.27 +/- 1.48	1.26 +/- 1.62
05/25/10	Connecticut River, Downstream	88	-0.27 +/- 1.45	0.84 +/- 1.61
05/25/10	Connecticut River, Upstream	86	-0.55 +/- 1.42	2.24 +/- 1.65
05/25/10	Miller Farm	87	-0.42 +/- 0.73	3.93 +/- 1.70
05/25/10	Vernon Elementary School	82	5.38 +/- 1.16	3.79 +/- 1.69
06/15/10	3-3 Connecticut River Station	84A	0.00 +/- 1.61	1.83 +/- 1.65
06/15/10	3-4 Connecticut River Station	84B	0.26 +/- 1.57	0.70 +/- 1.62
06/15/10	3-8 Connecticut River Station	84C	-0.26 +/- 1.55	1.97 +/- 1.65
06/15/10	Discharge Forebay	84D	0.00 +/- 1.55	1.26 +/- 1.63
06/22/10	Blodgett Farm	85	4.48 +/- 1.06	4.36 +/- 1.72
06/22/10	Brattleboro Fire Dept, West Station	88	-1.83 +/- 1.43	1.12 +/- 1.62
06/22/10	Connecticut River, Downstream	88	-1.08 +/- 1.52	2.25 +/- 1.66
06/22/10	Connecticut River, Upstream	86	-0.28 +/- 1.61	1.12 +/- 1.63
06/22/10	Miller Farm	87	0.49 +/- 0.75	1.83 +/- 1.62
06/22/10	Vernon Elementary School	82	7.90 +/- 1.26	4.64 +/- 1.73
07/14/10	3-3 Connecticut River Station	84A	-0.26 +/- 1.35	1.72 +/- 1.67
07/14/10	3-4 Connecticut River Station	84B	0.55 +/- 1.44	2.43 +/- 1.69
07/14/10	3-8 Connecticut River Station	84C	-0.54 +/- 1.37	1.14 +/- 1.65
07/14/10	Discharge Forebay	84D	1.09 +/- 1.48	1.43 +/- 1.66
07/20/10	Blodgett Farm	85	4.44 +/- 1.10	4.59 +/- 1.75
07/20/10	Brattleboro Fire Dept, West Station	88	-0.30 +/- 0.75	1.00 +/- 0.84
07/20/10	Connecticut River, Downstream	88	-0.28 +/- 1.41	0.86 +/- 1.64
07/20/10	Connecticut River, Upstream	86	0.00 +/- 1.40	3.00 +/- 1.70
07/20/10	Miller Farm	87	0.00 +/- 0.76	3.15 +/- 1.71
07/20/10	Vernon Elementary School	82	5.80 +/- 1.19	5.87 +/- 1.79
08/17/10	3-3 Connecticut River Station	84A	-0.28 +/- 1.51	1.59 +/- 1.71
08/17/10	3-4 Connecticut River Station	84B	0.00 +/- 1.44	1.01 +/- 1.69
08/17/10	3-8 Connecticut River Station	84C	-0.26 +/- 1.43	1.15 +/- 1.70
08/17/10	Discharge Forebay	84D	1.03 +/- 1.50	0.86 +/- 1.69
08/24/10	Blodgett Farm	85	4.96 +/- 1.07	4.62 +/- 1.80
08/24/10	Brattleboro Fire Dept, West Station	88	-0.29 +/- 0.78	0.50 +/- 0.85
08/24/10	Connecticut River, Downstream	88	0.26 +/- 1.48	0.29 +/- 1.67
08/24/10	Connecticut River, Upstream	86	0.81 +/- 1.54	0.14 +/- 1.67
08/24/10	Miller Farm	87	0.00 +/- 0.67	2.74 +/- 1.74
08/24/10	Vernon Elementary School	82	7.20 +/- 1.21	5.92 +/- 1.83

Table 15. 2010 Total Alpha and Beta Radioactivity Water Results (continued)

Date of Sample	Sample Location	Map ID	Total Alpha Radioactivity +/- error (pCi/L)	Total Beta Radioactivity +/- error (pCi/L)
09/15/10	3-3 Connecticut River Station	84A	1.05 +/- 1.37	0.99 +/- 1.64
09/15/10	3-4 Connecticut River Station	84B	1.13 +/- 1.47	1.13 +/- 1.64
09/15/10	3-8 Connecticut River Station	84C	1.70 +/- 1.52	1.70 +/- 1.66
09/15/10	Discharge Forebay	84D	1.43 +/- 1.51	2.27 +/- 1.68
09/21/10	Blodgett Farm	85	3.90 +/- 1.08	5.11 +/- 1.76
09/21/10	Brattleboro Fire Dept, West Station	88	0.44 +/- 0.75	1.77 +/- 0.86
09/21/10	Connecticut River, Downstream	88	0.86 +/- 1.48	0.85 +/- 1.64
09/21/10	Connecticut River, Upstream	86	-0.56 +/- 1.33	0.43 +/- 1.62
09/21/10	Miller Farm	87	-0.50 +/- 0.74	2.41 +/- 1.68
09/21/10	Vernon Elementary School	82	6.52 +/- 1.24	3.97 +/- 1.73
10/14/10	3-3 Connecticut River Station	84A	0.55 +/- 1.34	2.42 +/- 1.74
10/14/10	3-4 Connecticut River Station	84B	-0.25 +/- 1.18	0.85 +/- 1.69
10/14/10	3-8 Connecticut River Station	84C	0.00 +/- 1.22	1.28 +/- 1.71
10/14/10	Discharge Forebay	84D	1.01 +/- 1.28	0.85 +/- 1.69
10/19/10	Blodgett Farm	85	3.70 +/- 1.07	4.57 +/- 1.80
10/19/10	Brattleboro Fire Dept, West Station	88	-0.14 +/- 0.67	0.78 +/- 0.86
10/19/10	Connecticut River, Downstream	88	1.27 +/- 0.75	1.28 +/- 0.87
10/19/10	Connecticut River, Upstream	86	0.14 +/- 0.69	0.86 +/- 0.86
10/19/10	Miller Farm	87	0.07 +/- 0.79	0.57 +/- 1.69
10/19/10	Vernon Elementary School	82	7.33 +/- 1.29	4.99 +/- 1.81
11/16/10	3-3 Connecticut River Station	84A	-0.45 +/- 0.88	2.00 +/- 0.85
11/16/10	3-4 Connecticut River Station	84B	-0.30 +/- 0.88	1.22 +/- 0.83
11/16/10	3-8 Connecticut River Station	84C	-0.43 +/- 0.83	2.00 +/- 0.85
11/16/10	Discharge Forebay	84D	0.00 +/- 0.60	1.33 +/- 0.57
11/22/10	Blodgett Farm	85	4.16 +/- 1.05	5.30 +/- 1.74
11/22/10	Brattleboro Fire Dept, West Station	88	-1.28 +/- 1.46	2.57 +/- 1.66
11/22/10	Connecticut River, Downstream	88	-0.26 +/- 1.54	1.57 +/- 1.63
11/22/10	Connecticut River, Upstream	86	0.26 +/- 1.60	1.00 +/- 1.61
11/22/10	Miller Farm	87	0.65 +/- 0.78	4.15 +/- 1.70
11/22/10	Vernon Elementary School	82	7.67 +/- 1.27	5.58 +/- 1.74
12/16/10	3-3 Connecticut River Station	84A	0.15 +/- 0.85	1.06 +/- 0.85
12/16/10	3-4 Connecticut River Station	84B	-0.29 +/- 0.79	1.06 +/- 0.85
12/16/10	3-8 Connecticut River Station	84C	0.09 +/- 0.51	-0.09 +/- 0.54
12/16/10	Discharge Forebay	84D	0.57 +/- 0.85	1.48 +/- 0.86
12/21/10	Blodgett Farm	85	3.94 +/- 1.06	7.50 +/- 1.85
12/21/10	Brattleboro Fire Dept, West Station	88	-0.78 +/- 1.41	1.27 +/- 1.68
12/21/10	Connecticut River, Downstream	88	0.15 +/- 0.85	1.48 +/- 0.86
12/21/10	Connecticut River, Upstream	86	0.29 +/- 0.84	0.64 +/- 0.84
12/21/10	Miller Farm	87	-0.22 +/- 0.72	1.98 +/- 1.70
12/21/10	Vernon Elementary School	82	6.49 +/- 1.22	5.09 +/- 1.78

Figure 4. 2009 and 2010 Comparative Average Alpha Radioactivity in Water

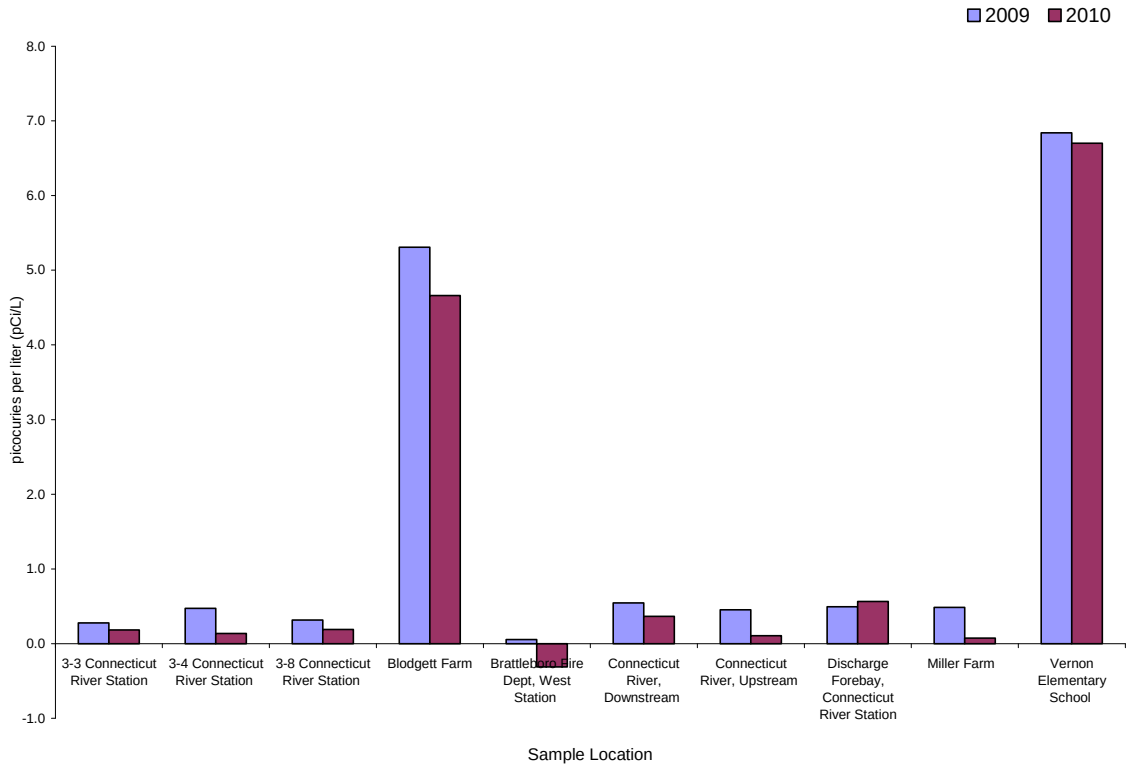
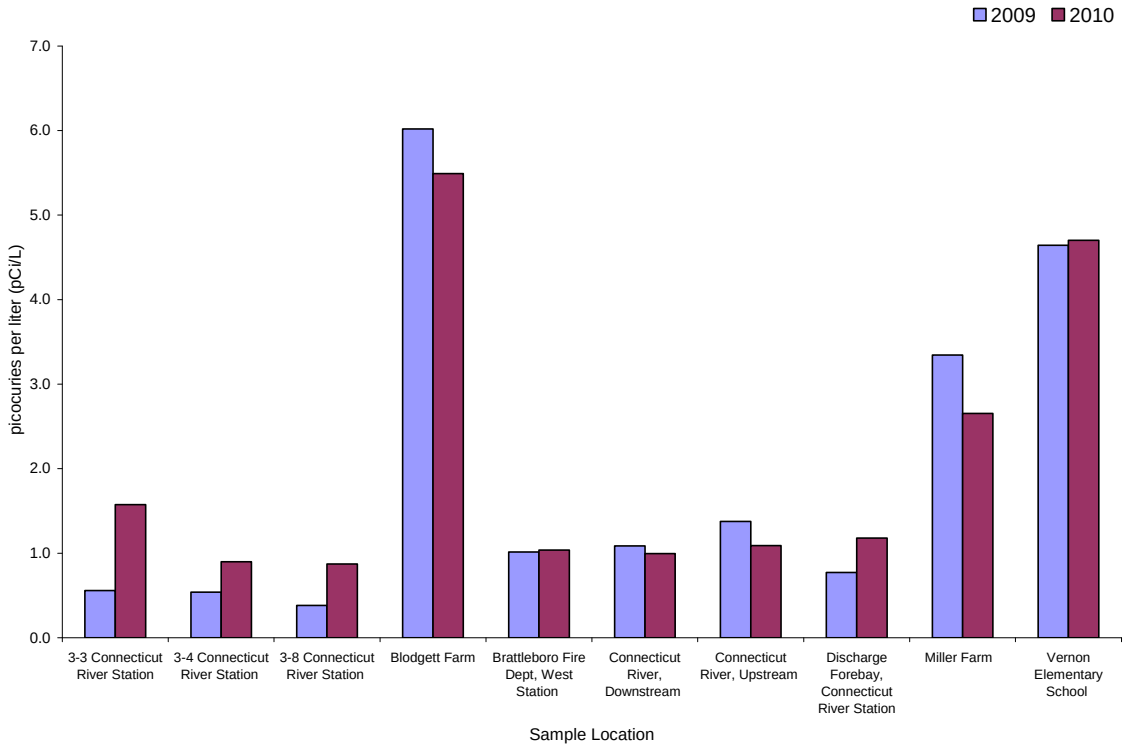


Figure 5. 2009 and 2010 Comparative Average Beta Radioactivity in Water



Water Gamma Spectroscopy Results

The Health Department Laboratory tested 893 drinking, ground and surface (Connecticut River) water samples collected from both on and off-site locations in 2010 for gamma-emitting materials. No radioactive materials other than naturally-occurring materials were identified in any water sample collected in 2010. The Health Department calculated limits of detection for gamma-emitting materials are listed in Table 8. All results are presented in Appendix B.

Water Tritium Results

The Health Department Laboratory confirmed the presence of tritium in monitoring well GZ-03 in January 2010.

In 2010, the Health Department tested 1,131 drinking, ground and surface (Connecticut River) water samples collected from both on and off-site locations in 2010 for tritium. Tritium was reported in 289 of those water samples. Tritium measurements reported ranged from 523 to 2,650,000 picocuries per liter (pCi/L). None of the tritium detected was from any off-site water sample, any Connecticut River sample, or any on-site active drinking water sample. The Health Department's lower limit of detection for tritium is 500 pCi/L.

The Construction Office Building (COB) well, a Vermont Yankee drinking water well, was taken off-line as a drinking water source on February 25, 2010. The COB well is approximately 360 feet deep. During testing of the off-line COB well in September and October of 2010, a sample taken at the 200 to 220 foot depth tested positive for tritium at a concentration of 1,050 pCi/L. A sample taken at the lower depth of 300 to 320 feet was less than the lower limit of detection for tritium. No gamma-emitting materials or hard-to-detect radioactive metals were identified in either of these COB water samples. No additional samples from the COB well have been obtained since October 2010.

Tritium well results from groundwater monitoring wells confirmed the presence and movement of an underground plume of tritium-contaminated water. The plume traveled from the source of the leak at the Advanced Off-Gas Building to the Connecticut River. No tritium was detected in any Connecticut River water sample in 2010. The decreasing tritium concentrations over time, as measured by groundwater well results, also showed that two sources of the original leaks had been stopped by Vermont Yankee in March 2010.

A brief summary of tritium results by each sampling location is presented in Tables 16 and 17. Graphs demonstrating the trends in tritium concentrations in groundwater monitoring wells are presented in Figures 6-10. All tritium data are presented in Appendix A.

Map 9. 2010 Water Sample Sites on Vermont Yankee and Estimated December 2010 Plume Footprint

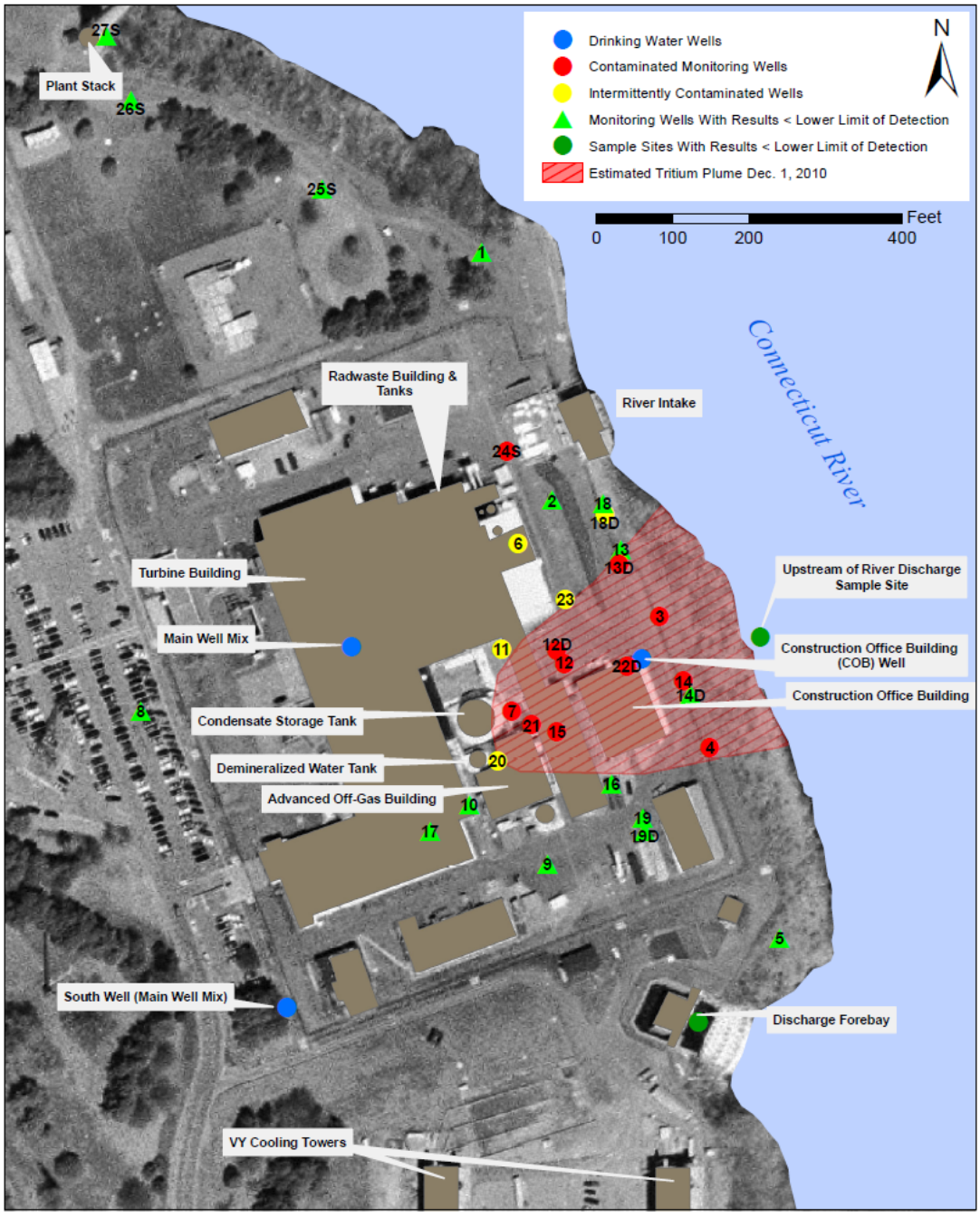


Table 16. 2010 Water Sample Locations, Tritium Detected

Monitoring Well	Date of Health Department's First Sample	Number of Water samples tested	Range of tritium concentration in well (pCi/L)			Trend of Tritium Concentration in 2010
			Low		**High**	
GZ-03	January 7, 2010	35	13,800	to	175,000	Increasing
GZ-04	February 1, 2010	32	1,730	to	73,000	Increasing
GZ-06	February 1, 2010	25	< 500	to	627	One detection in December 2010
GZ-07	February 8, 2010	29	2,510	to	1,231,000	Decreasing
GZ-10	February 8, 2010	31	< LLD	to	2,651,000	Decreasing
GZ-11	February 8, 2010	30	523	to	561	Just above detection limit March --> August
GZ-12S	February 8, 2010	31	4,770	to	701,000	Increasing to May, then decreasing
GZ-12D	December 6, 2010	1	73,900			One sample in 2010
GZ-13D	March 8, 2010	27	< LLD	to	1,270	Similar range for entire year
GZ-14S	February 1, 2010	31	52,900	to	479,000	Increasing
GZ-15	February 16, 2010	28	53,300	to	847,000	Decreasing
GZ-20	March 15, 2010	26	815	to	504,000	Decreasing
GZ-21	March 15, 2010	26	11,300	to	2,048,000	Decreasing
GZ-22D	December 6, 2010	1	528,000			One sample in 2010
COB Well	January 18, 2010	7	<LLD	to	1,050	During testing, one sample tested positive at 200-220 foot depth

< LLD means less the Laboratory's Lower Limit of Detection

Table 17. 2010 Water Sample Locations, Tritium Not Detected

Water Sampling Locations-No tritium detected in 2010	Number of samples tested
Groundwater Monitoring Wells	
WVN0201	4
WVN0202	4
WVN0203	4
WVN0204	4
GZ-01	13
GZ-02	12
GZ-05	32
GZ-08	0
GZ-09	24
GZ-13S	31
GZ-14D	27
GZ-16	27
GZ-17	23
GZ-18S	3
GZ-18D	2
GZ-19S	22
GZ-19D	21
GZ-23S	1
GZ-24S	1
GZ-25S	1
GZ-26S	1
GZ-27S	1
Connecticut River Sites	
3-3 Connecticut River Station	12
3-4 Connecticut River Station	12
3-8 Connecticut River Station	12
Discharge Forebay, Connecticut River	12
Connecticut River, Downstream	45
Connecticut River, Upstream	30
Upstream of the River Discharge/Vernon Pond	60
Off-site Drinking Water Sites	
Brattleboro Fire Dept, West Station	32
Blodgett Farm	31
Miller Farm	32
Vernon Elementary School	40
Vernon Green Nursing Home	35
Residence - 1	28
Residence - 2	19
Residence - 3	28
Vernon EOC	12
On-site Drinking Water Sites	
VY Garage	15
White House	16
Main Well	23
PSB Well	19

Health Department Results

Figure 6. 2010 Tritium in Groundwater Monitoring Wells: GZ-03, GZ-04, GZ-14S (perimeter wells)

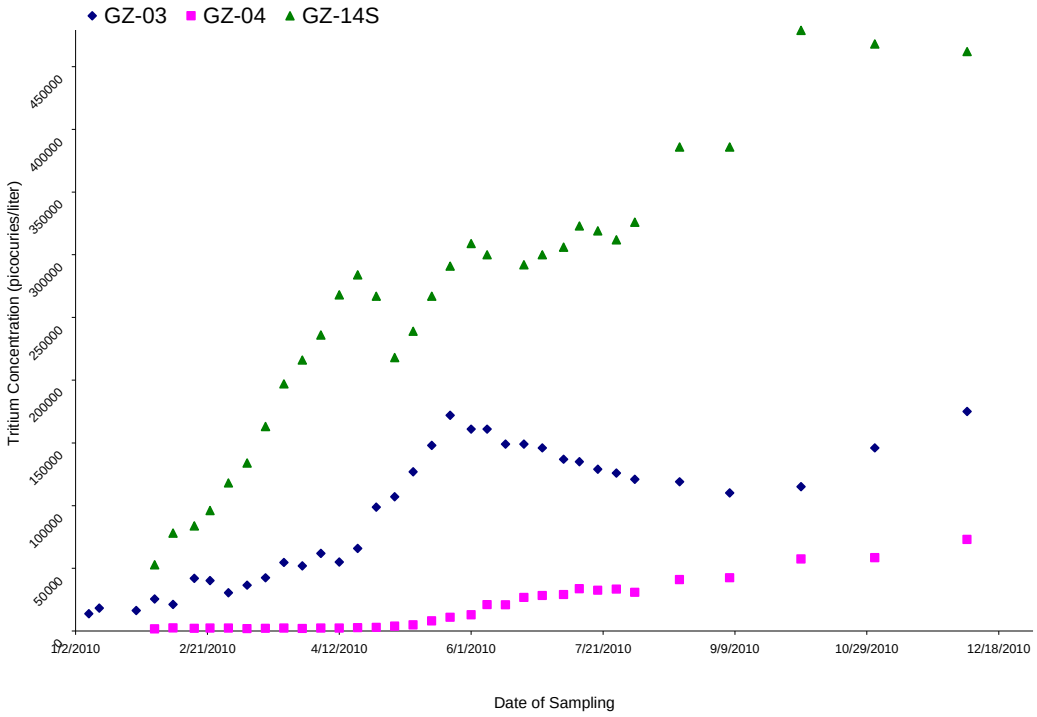


Figure 7. 2010 Tritium in Groundwater Monitoring Wells: GZ-12S, GZ-15

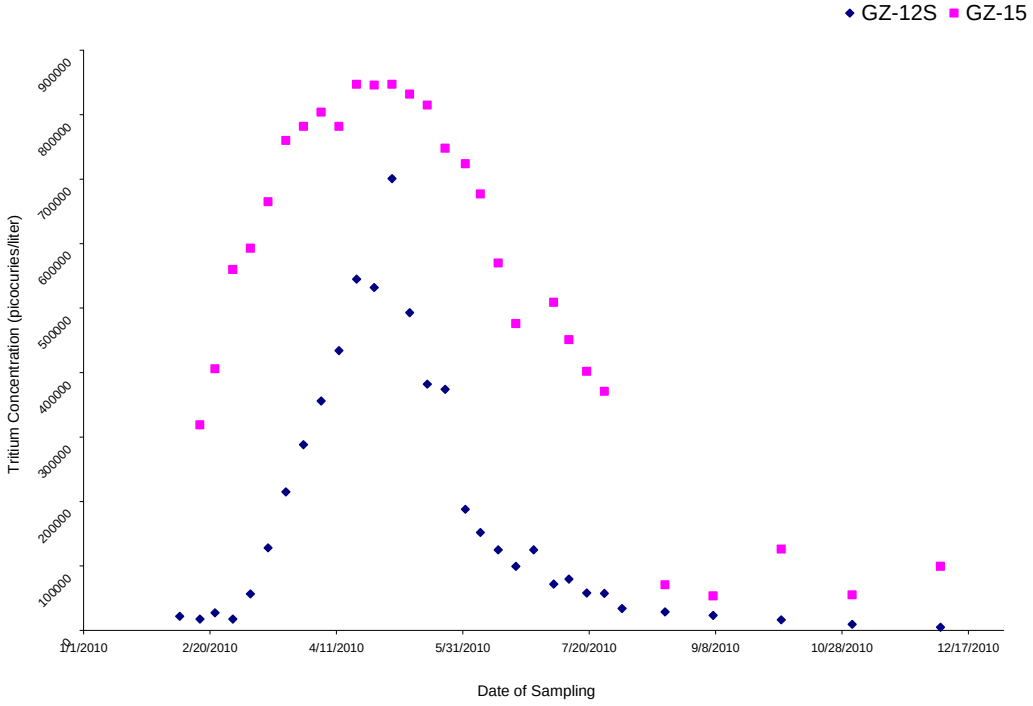


Figure 8. 2010 Tritium in Groundwater Monitoring Wells: GZ-07, GZ-21

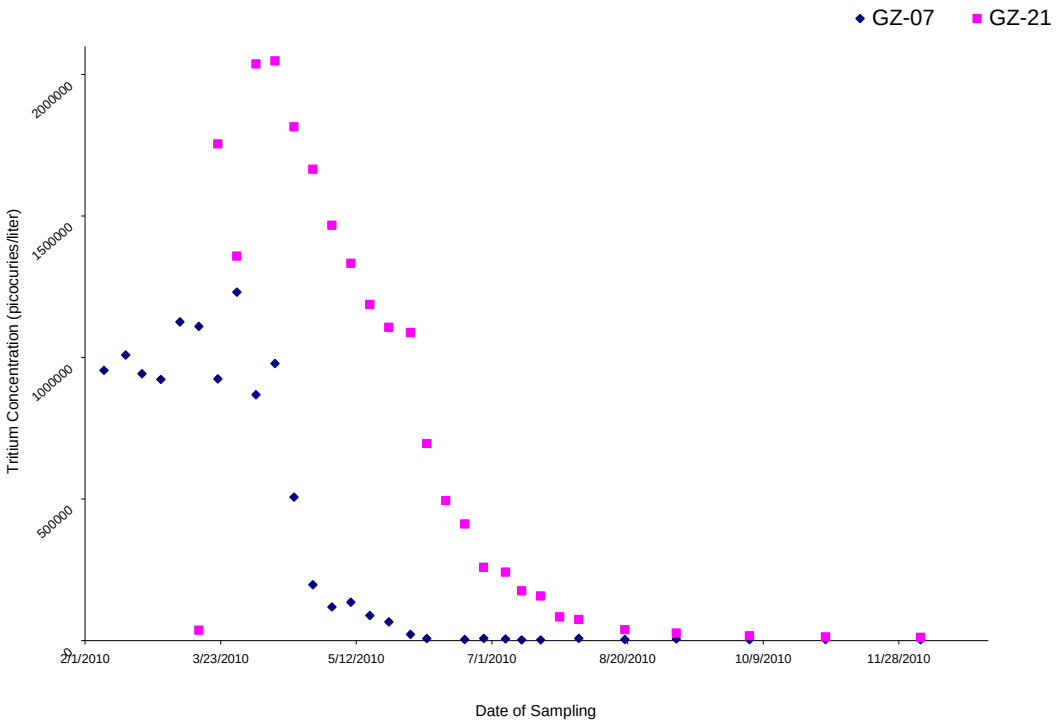


Figure 9. 2010 Tritium in Groundwater Monitoring Wells: GZ-13D, GZ-11

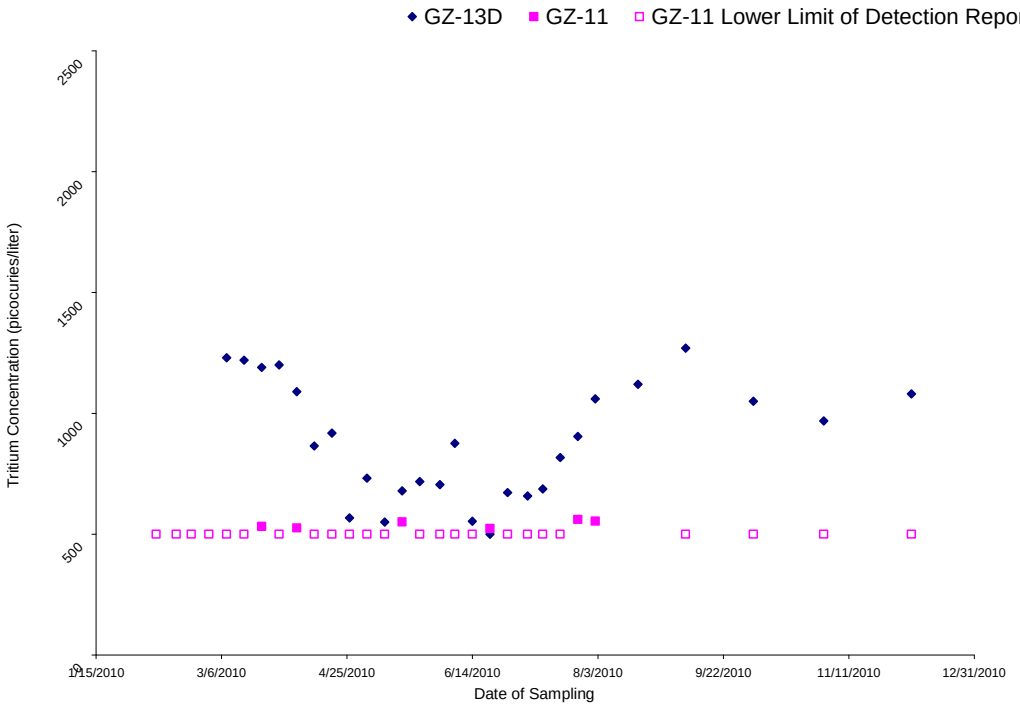


Figure 10a. 2010 Tritium in Groundwater Monitoring Wells: GZ-10, GZ-20 (February through May)

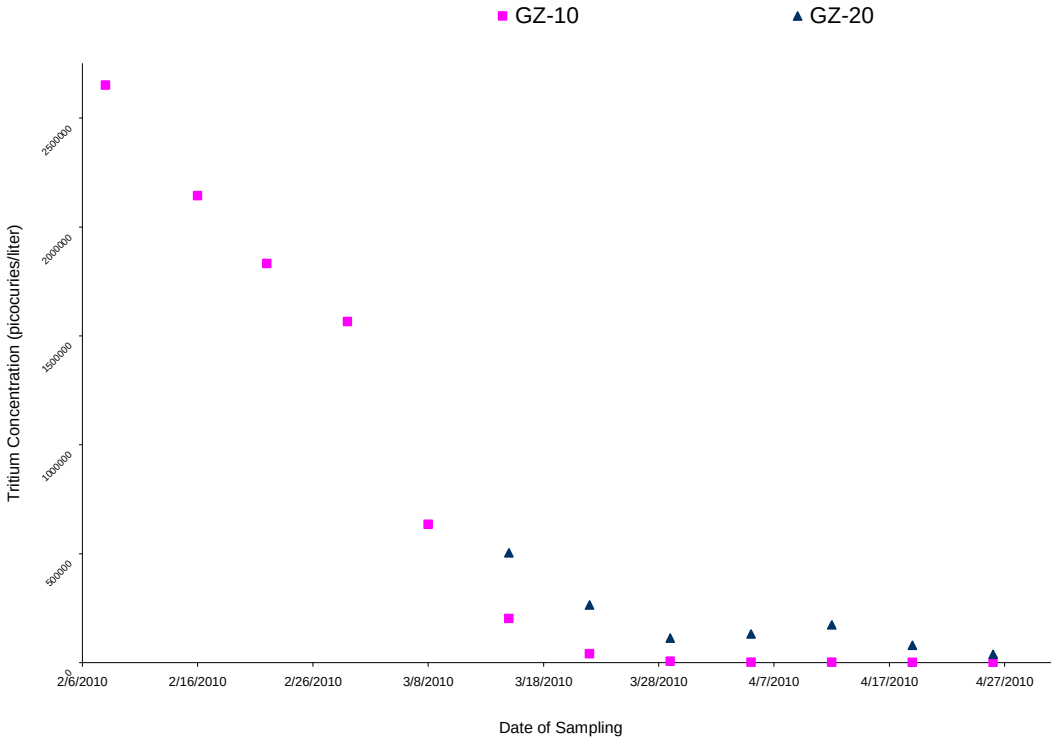
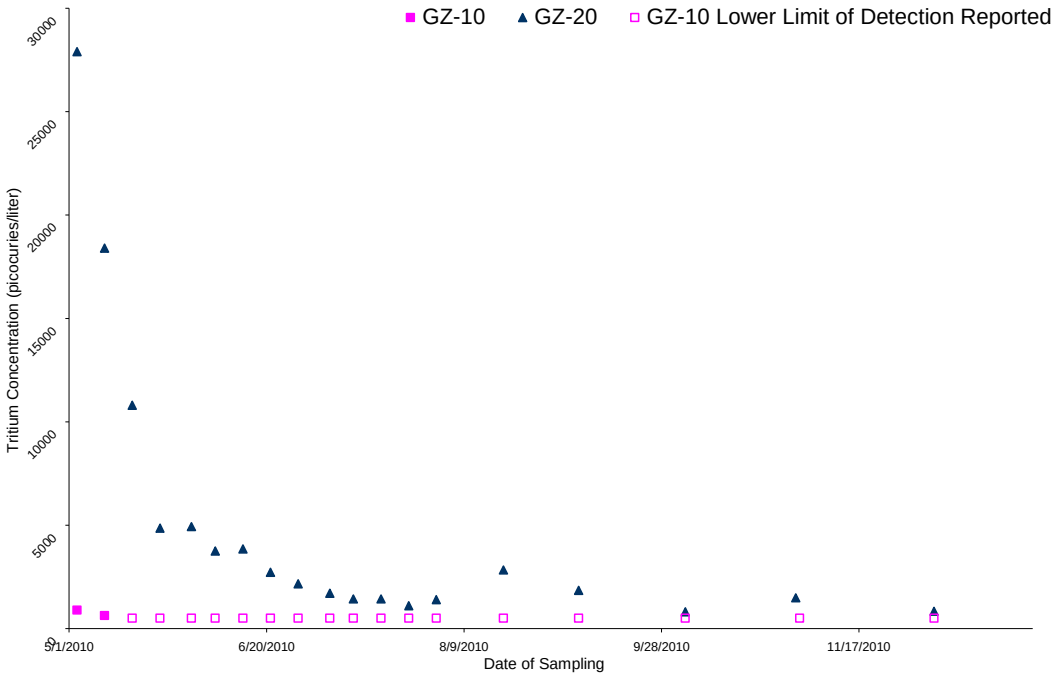


Figure 10b. 2010 Tritium in Groundwater Monitoring Wells: GZ-10, GZ-20 (May through December)



Hard-to-Detect Results

This is the first year that analyses of hard-to-detect materials, iron-55, nickel-63, strontium-89 and strontium-90, have been done by the Health Department. Quarterly water samples taken from each water sampling location were submitted to a contract laboratory for testing. Occasionally, because of limited sample volume or missed collection, a quarterly sample was not able to be sent for testing. Of the 169 water samples tested, no iron-55, nickel-63, strontium-89, or strontium-90 was detected. Results for hard-to-detect samples are provided in Appendix C.

In 2010, all off-site water sample locations showed no dose impact of operations at Vermont Yankee for total alpha, total beta, tritium, gamma spectroscopy, and hard-to-detect radioactive elements. In 2010, the one radioactive element that has been measured in water samples is tritium from on-site water sources. The levels of tritium detected show a groundwater plume traveling from the source of the leaks to the Connecticut River. The decreasing measurements of tritium in the groundwater wells over time also showed that at least two sources of the leaks had been stopped by Vermont Yankee. The dose associated with the tritium-contaminated plume in 2010 at Vermont Yankee did not measurably increase the dose from liquid effluents (discharges) to any member of the general public.

Food Chain Sampling Results

Monitoring the food chain involves direct monitoring of some foods such as milk, cultivated vegetation and fish. It also involves testing the soil and sediment that support land and aquatic species, and natural vegetation like grass, ferns and fungi.

For 2010:

- 22 milk samples were tested for iodine-131 and gamma-emitting materials.
- 38 Connecticut River sediment samples were tested for gamma-emitting materials.
- 7 environmental soil samples were tested for gamma-emitting materials.
- 8 vegetation samples were tested for gamma-emitting materials.
- 25 fish samples were collected.
    - 12 were tested for gamma-emitting materials.
    - 15 were tested for iron-55, nickel-63 and strontium-89.
    - 19 were tested for strontium-90.

Milk Sample Results

Cows' raw milk is sampled monthly from two farms in Vernon. One farm is about one-half mile north of Vermont Yankee and the other is about three miles south of Vermont Yankee. Map 10 shows the location of these two dairy farms.

Potassium-40 (K-40) was found in all milk samples. Potassium-40 is a primordial radioactive material. Primordial radioactive materials are those created with the formation of the earth. Potassium-40 has a half-life of 1.28 billion years. Only potassium-40 was detected in milk samples. Results are shown in Table 18. The potassium-40 results for all milk samples, ranging from 1,220 to 1,510 picocuries per liter (pCi/L), fall within the historical range for potassium-40 of 1,200 to 2,000 pCi/L. The average potassium-40 result was 1,390 pCi/L.

Map 10

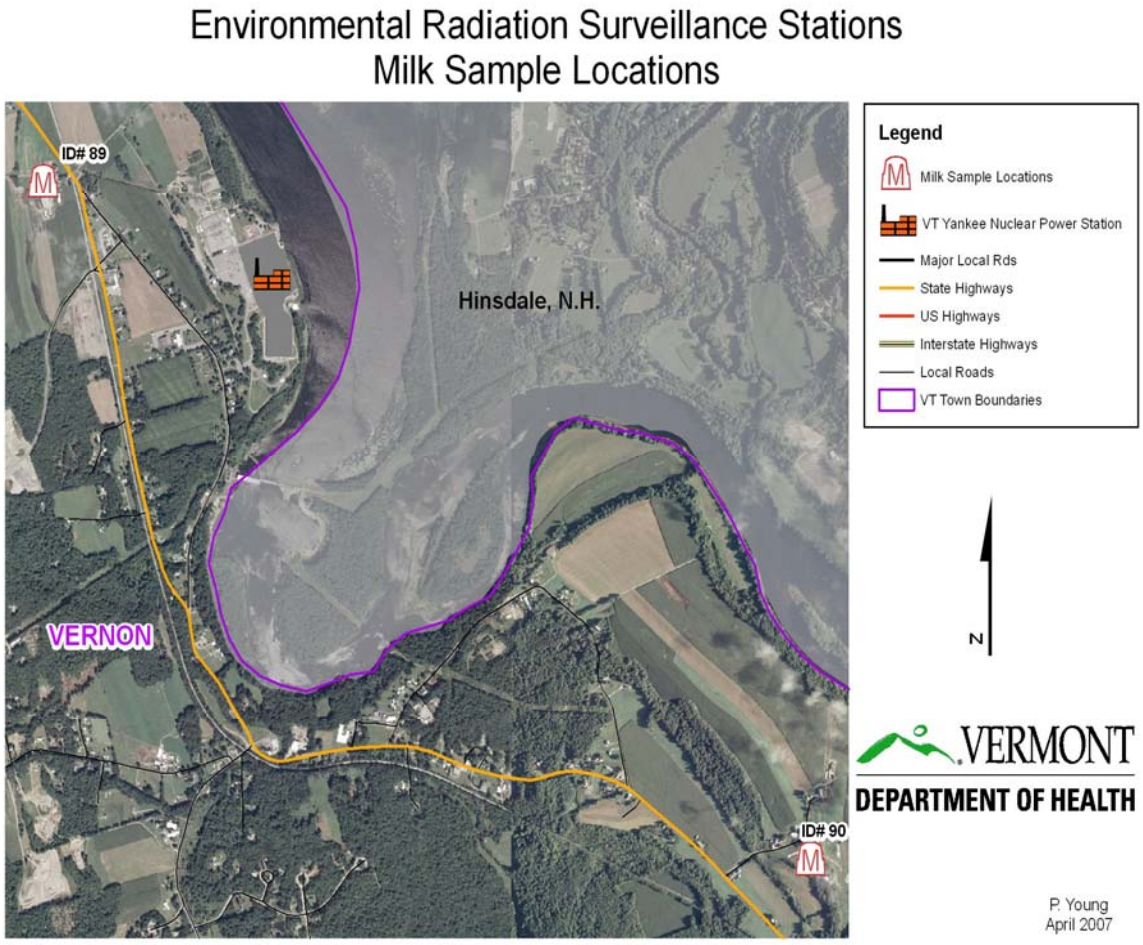

Environmental Radiation Surveillance Stations
Milk Sample Locations
ID# 89
Hinsdale, N.H.
VERNON
ID# 90
Legend
Milk Sample Locations
VT Yankee Nuclear Power Station
Major Local Rds
State Highways
US Highways
Interstate Highways
Local Roads
VT Town Boundaries
N
VERMONT
DEPARTMENT OF HEALTH
P. Young
April 2007

Table 18. 2010 Milk Iodine-131 and Gamma Spectroscopy Results

Sample Location	Date of Sample	Map ID	Iodine-131 Result	Gamma Spectrometry Result	Potassium-40 ± error (pCi/L)
Blodgett Farm	2/2/2010	90	<LLD	Natural	1,400 +/- 240
Miller Farm	2/2/2010	89	<LLD	Natural	1,310 +/- 220
Blodgett Farm	3/15/2010	90	<LLD	Natural	1,390 +/- 230
Miller Farm	3/15/2010	89	<LLD	Natural	1,300 +/- 220
Blodgett Farm	4/19/2010	90	<LLD	Natural	1,420 +/- 240
Miller Farm	4/19/2010	89	<LLD	Natural	1,410 +/- 240
Blodgett Farm	5/25/2010	90	<LLD	Natural	1,410 +/- 260
Miller Farm	5/25/2010	89	<LLD	Natural	1,220 +/- 230
Blodgett Farm	6/22/2010	90	<LLD	Natural	1,510 +/- 280
Miller Farm	6/22/2010	89	<LLD	Natural	1,360 +/- 250
Blodgett Farm	7/20/2010	90	<LLD	Natural	1,470 +/- 270
Miller Farm	7/20/2010	89	<LLD	Natural	1,350 +/- 250
Blodgett Farm	8/24/2010	90	<LLD	Natural	1,460 +/- 270
Miller Farm	8/24/2010	89	<LLD	Natural	1,400 +/- 260
Miller Farm	9/21/2010	89	<LLD	Natural	1,270 +/- 240
Blodgett Farm	9/28/2010	90	<LLD	Natural	1,390 +/- 260
Blodgett Farm	10/19/2010	90	<LLD	Natural	1,390 +/- 260
Miller Farm	10/19/2010	89	<LLD	Natural	1,410 +/- 260
Blodgett Farm	11/22/2010	90	<LLD	Natural	1,430 +/- 260
Miller Farm	11/22/2010	89	<LLD	Natural	1,340 +/- 250
Blodgett Farm	12/21/2010	90	<LLD	Natural	1,430 +/- 260
Miller Farm	12/21/2010	89	<LLD	Natural	1,460 +/- 270

< LLD means less than the Laboratory's Lower Limit of Detection
Natural means gamma-emitting materials detected are not related to nuclear power stations or above-ground weapons testing

Vegetation and Soil Sample Results

Seven soil samples were collected in the vicinity of Vermont Yankee. At each site that a soil sample was collected, a vegetation sample was also collected. Miller Farm had two vegetation samples collected. The results are shown in Table 19. The soil contained measurable amounts of potassium-40, beryllium-7 and cesium-137. Potassium-40 and beryllium-7 are naturally-occurring. Cesium-137 is human-made. The amounts found are consistent with past years and attributable to above-ground weapons testing and other nuclear incidents. The vegetation only had measurable amounts of potassium-40 and beryllium-7. Potassium-40 was found in all soil and vegetation samples.

Potassium-40 in soil ranged from 7,660 – 17,400 picocuries per kilogram and in vegetation from 2,460-7,760 picocuries per kilogram. Beryllium-7 in soil was only found in two samples at about 500 picocuries per kilogram, and in seven vegetation samples at 986 to 4,220 picocuries per kilogram. Cesium-137 was measured in four of the seven soil samples and not measured in any vegetation sample. Cesium-137 amounts ranged from 133 to 515 picocuries per kilogram. All amounts were within historical ranges for Vermont samples.

Soil samples were also collected on-site near the Advanced Off Gas leak area. Data from those samples is presented in Appendix D.

Table 19. 2010 Soil and Vegetation Gamma Spectroscopy Results

Type	Sample Location	Date of Sample	Potassium-40 ± error (pCi/kg)	Beryllium-7 ± error (pCi/kg)	Cesium-137 ± error (pCi/kg)
Soil	Blodgett Farm	9/2/2010	17,400 +/- 3,000	512 +/- 198	133 +/- 29
	Dummerston State Garage	9/2/2010	15,400 +/- 2,600	< LLD	< LLD
	Indian Pt Park	9/2/2010	11,700 +/- 2,000	< LLD	515 +/- 49
	Miller Farm	9/2/2010	12,800 +/- 2,200	421 +/- 150	< LLD
	Stebbins Rd	9/2/2010	10,600 +/- 1,900	< LLD	446 +/- 47
	Vernon Dam	9/2/2010	7,660 +/- 1,340	< LLD	< LLD
	Vernon Elementary School	9/2/2010	13,600 +/- 2,300	< LLD	160 +/- 28
Vegetation	Blodgett Farm	9/2/2010	6,600 +/- 1,300	1,680 +/- 290	< LLD
	Dummerston State Garage	9/2/2010	5,780 +/- 1,130	1,730 +/- 300	< LLD
	Indian Pt Park	9/2/2010	6,700 +/- 1,390	4,220 +/- 590	< LLD
	Miller Farm	9/2/2010	5,580 +/- 1,030	986 +/- 139	< LLD
	Miller Farm *	9/2/2010	7,740 +/- 1,310	< LLD	< LLD
	Stebbins Rd	9/2/2010	6,340 +/- 1,190	3,700 +/- 420	< LLD
	Vernon Dam	9/2/2010	2,460 +/- 500	1,520 +/- 200	< LLD
	Vernon Elementary School	9/2/2010	7,460 +/- 1,410	3,300 +/- 410	< LLD

< LLD means less than the Laboratory's Lower Limit of Detection

Figure 11. 2010 Soil Gamma Spectroscopy Results

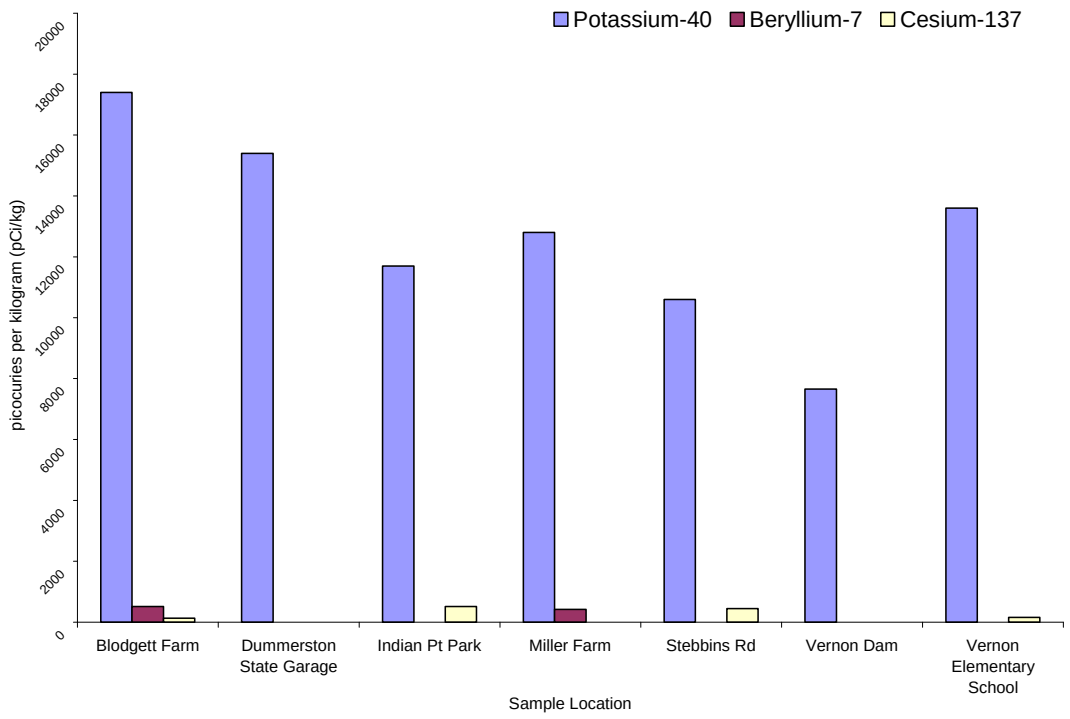
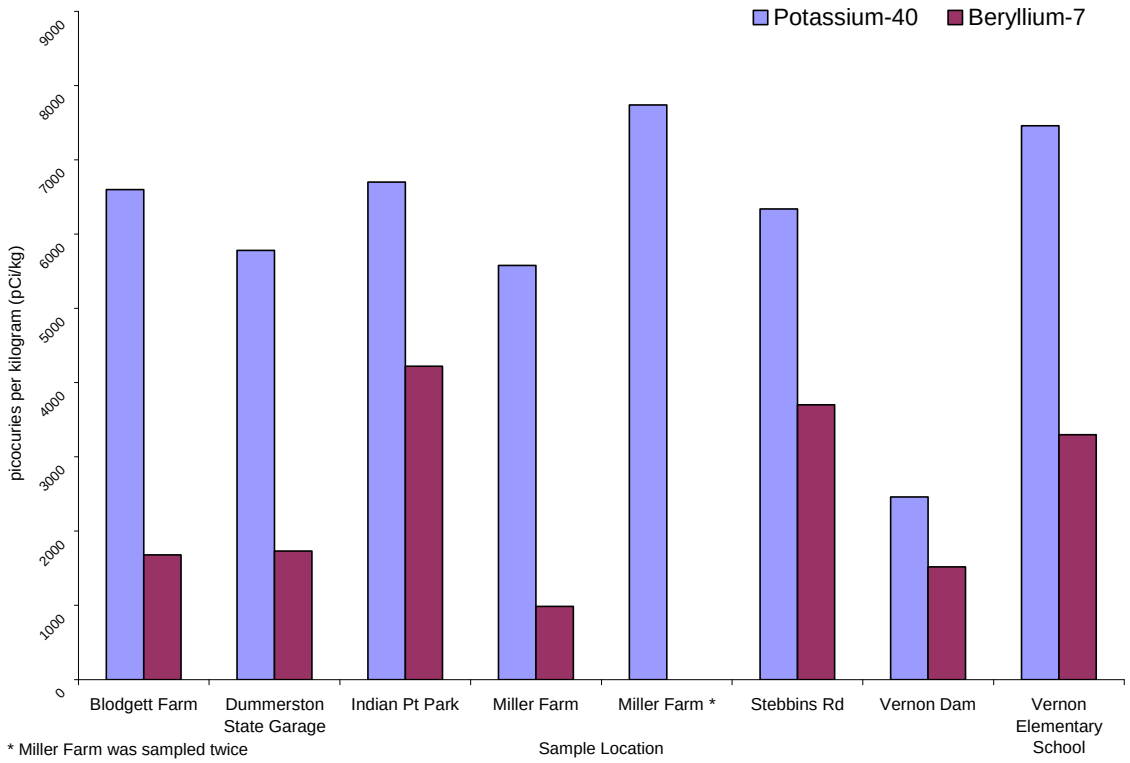


Figure 12. 2010 Vegetation Gamma Spectroscopy Results



Sediment Sample Results

Sediment samples were collected from the bottom of the Connecticut River. The sediment samples were taken from four areas of the Connecticut River: Station 3-3 (south of Vernon Dam), Station 3-4 (near Vermont Yankee discharge), Station 3-8 (upstream near the Route 9 bridge) and the North Storm Drain area. In 1997, the North Storm Drain area was identified to have been contaminated with cobalt-60 from Vermont Yankee operations. The North Storm Drain area is sampled at 15 distinct locations: S-1, S-2, T-1, T-2, T-3, U-1, U-2, U-3, U-4, V-3, V-4, V-5, W-4, W-5 and X-5. These sample locations are shown in Map 11. Cobalt-60 was last detected in a sediment sample obtained and tested in 2004.

All sediment locations are sampled each spring and fall. A sediment sample is taken with a mass ranging from 0.75 to 1.25 kilograms. Sediment samples are dried and tested by gamma spectroscopy. Tested sediments contained naturally-occurring potassium-40 (K-40) and beryllium-7 (Be-7), as well as fallout-related cesium-137 (Cs-137). The results are presented in Table 21. No cobalt-60 was detected in samples collected this year. Concentrations of beryllium-7, potassium-40 and cesium-137 were detected within historical ranges for Vermont. Comparisons to last year's data are presented in Figures 13 and 14.

Table 20. 2010 Sediment Gamma Spectroscopy Ranges as Compared to Historical Ranges

Radioactive Element	2010 Sediment Concentration Range (pCi/kg)	Historical Sediment Concentration Range (pCi/kg)
Beryllium-7	< LLD-1,530	< LLD-3,000
Potassium-40	10,800-24,500	6,000-26,000
Cesium-137	< LLD-191	< LLD-500

< LLD means less the Laboratory's **L**ower **L**imit of **D**etection

Map 11

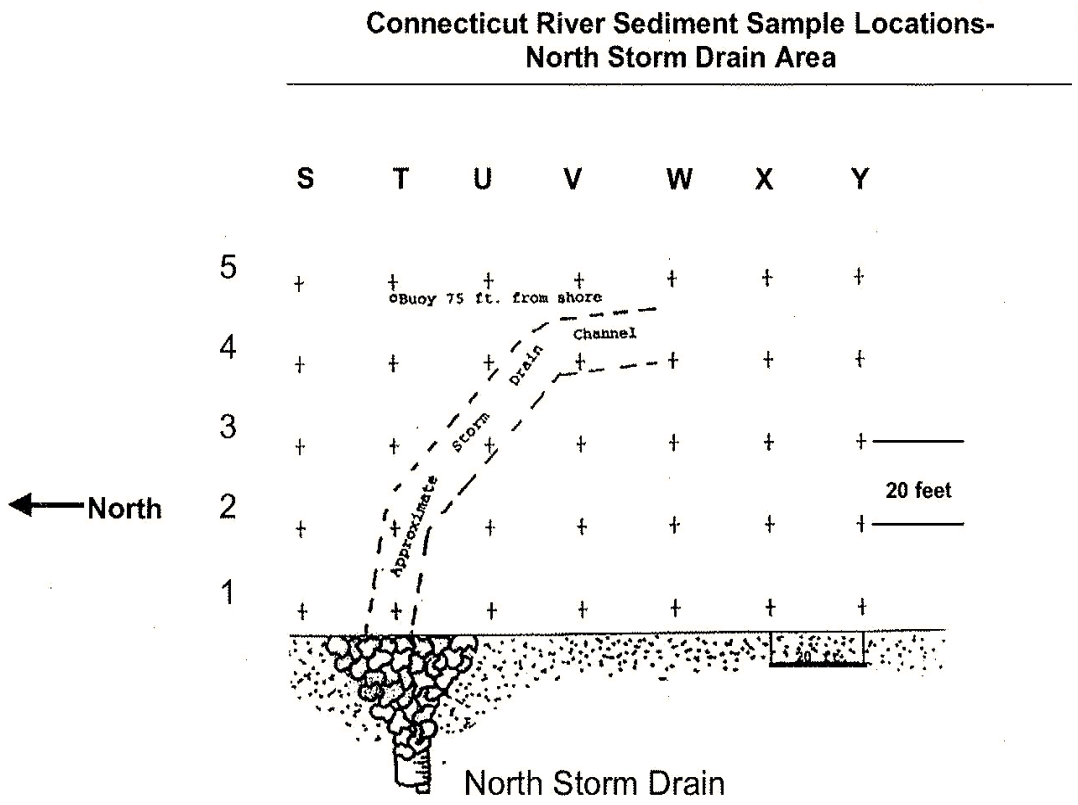

Connecticut River Sediment Sample Locations-
North Storm Drain Area
S
T
U
V
W
X
Y
5
4
3
2
1
North
Buoy 75 ft. from shore
Channel
Storm Drain
Approximate
20 feet
North Storm Drain

Table 21. 2010 Sediment Gamma Spectroscopy Results

Sample Location	Date of Sample	Potassium-40 +/- error (pCi/kg)	Beryllium-7 +/- error (pCi/kg)	Cesium-137 +/- error (pCi/kg)
Station Control	1/22/2010	14,100 +/- 2,400	< LLD	107 +/- 43
Disch. Upstream	1/22/2010	13,800 +/- 2,400	< LLD	85.8 +/- 31
3-3	5/13/2010	13,100 +/- 2,300	699 +/ 268	34.3 +/- 18
3-3	10/29/2010	11,000 +/- 1,900	< LLD	47.3 +/- 23
3-4	5/13/2010	13,400 +/- 2,300	< LLD	63.1 +/- 20
3-4	10/28/2010	10,800 +/- 1,900	< LLD	< LLD
3-8	5/13/2010	14,700 +/- 2,500	1,530 +/ 340	88.5 +/- 30
3-8	10/29/2010	12,900 +/- 2,200	< LLD	60.0 +/- 20
S-1	5/13/2010	12,800 +/- 2,200	< LLD	67.4 +/- 23
S-1	10/28/2010	15,300 +/- 2,600	< LLD	128 +/- 36
S-2	5/13/2010	23,000 +/- 3,900	< LLD	157 +/- 46
S-2	10/28/2010	21,000 +/- 3,600	< LLD	120 +/- 40
T-1	5/13/2010	10,800 +/- 1,800	< LLD	43.5 +/- 17
T-1	10/28/2010	10,900 +/- 1,900	1,250 +/ 290	54.1 +/- 21
T-2	5/13/2010	13,800 +/- 2,400	< LLD	87.4 +/- 31
T-2	10/28/2010	19,500 +/- 3,300	632 +/ 342	119 +/- 33
T-3	5/13/2010	20,400 +/- 3,500	< LLD	155 +/- 41
T-3	10/28/2010	21,900 +/- 3,800	< LLD	191 +/- 44
U-1	5/13/2010	15,400 +/- 2,700	< LLD	86.0 +/- 36
U-1	10/28/2010	20,800 +/- 3,500	< LLD	132 +/- 40
U-2	5/13/2010	17,500 +/- 3,000	< LLD	130 +/- 35
U-2	10/28/2010	20,300 +/- 3,500	< LLD	165 +/- 39
U-3	5/13/2010	20,400 +/- 3,500	< LLD	133 +/- 38
U-3	10/28/2010	24,500 +/- 4,200	599 +/ 367	184 +/- 44
U-4	5/13/2010	17,300 +/- 3,000	< LLD	133 +/- 39
U-4	10/28/2010	20,700 +/- 3,500	< LLD	113 +/- 31
V-3	5/13/2010	17,800 +/- 3,100	< LLD	94.6 +/- 37
V-3	10/28/2010	19,900 +/- 3,400	< LLD	94.3 +/- 33
V-4	5/13/2010	18,000 +/- 3,100	< LLD	77.2 +/- 34
V-4	10/28/2010	20,100 +/- 3,400	< LLD	123 +/- 39
V-5	5/13/2010	22,200 +/- 3,800	< LLD	160 +/- 36
V-5	10/28/2010	20,400 +/- 3,500	< LLD	121 +/- 29
W-4	5/13/2010	18,500 +/- 3,200	< LLD	111 +/- 38
W-4	10/28/2010	20,000 +/- 3,400	< LLD	162 +/- 38
W-5	5/13/2010	18,600 +/- 3,200	< LLD	112 +/- 35
W-5	10/28/2010	19,100 +/- 3,200	< LLD	98.1 +/- 28
X-5	5/13/2010	19,500 +/- 3,300	< LLD	143 +/- 37
X-5	10/28/2010	16,600 +/- 2,900	< LLD	106 +/- 34

< LLD means less than the Laboratory's Lower Limit of Detection

Figure 13. 2009 and 2010 Comparative Potassium-40 Levels in Sediments

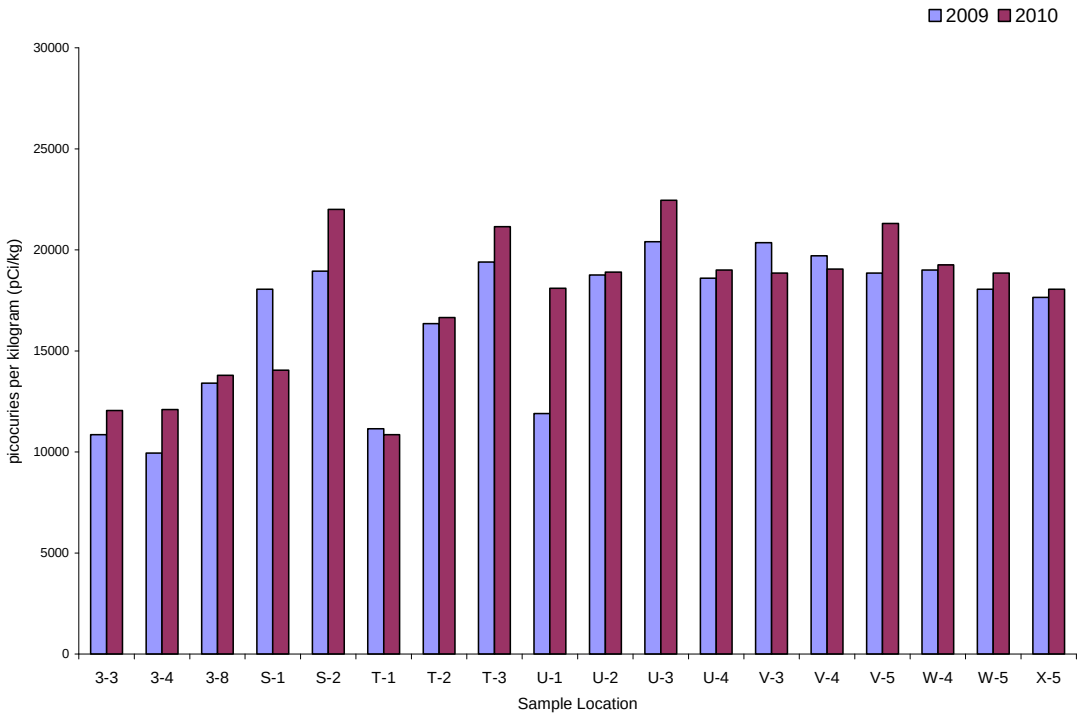
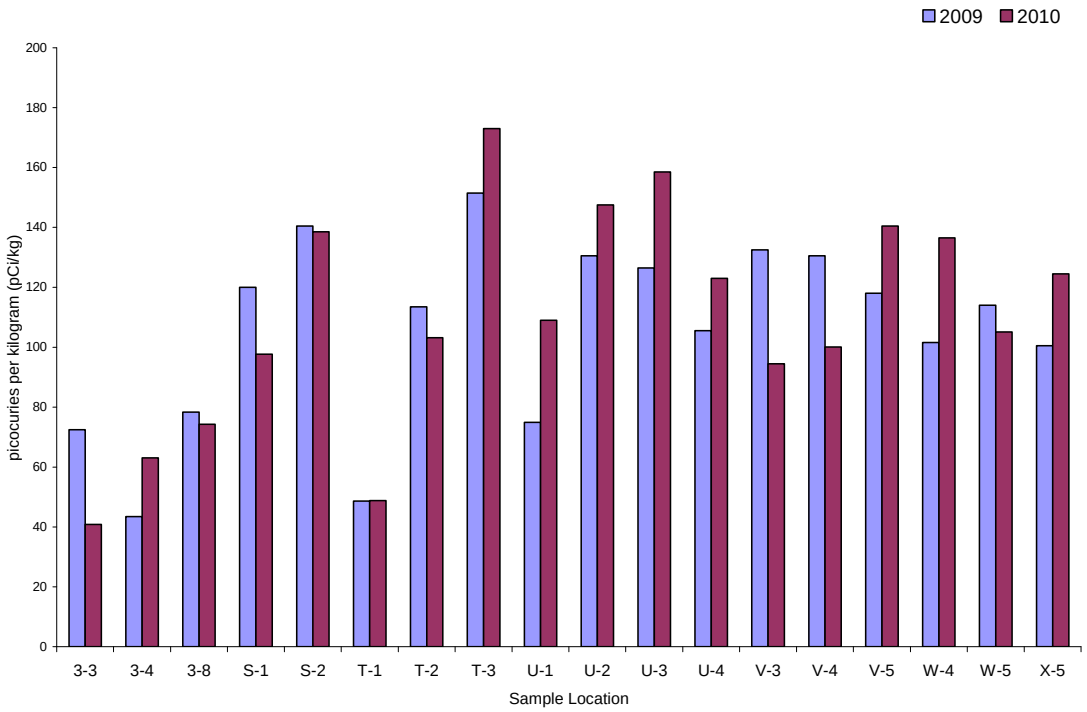


Figure 14. 2009 and 2010 Comparative Cesium-137 Levels in Sediments



Fish Sample Results

Fish are collected monthly at two sites in the Connecticut River by an environmental contractor. One site is near the Vermont Yankee discharge and the other site is about nine miles upstream from Vermont Yankee, where the Route 9 bridge crosses the Connecticut River. In January, due to ice-over of the river, the upstream sample was collected at Hunt's Meadow about four miles upstream of Vermont Yankee.

Fish were tested either as a whole fish, or divided into edible and inedible portions. The extent of the testing that can be done depends on the mass of fish caught and the laboratory's procedures. The Health Department's contract laboratory tests for hard-to-detects radioactive materials and, when there is enough of the fish remaining, gamma-emitting materials in both the edible and inedible portions are tested. The Health Department Laboratory tests whole fish for gamma-emitting materials. The first two sample collections of 2010 were tested for strontium-90 by the State of New York's Environmental Conservation Laboratory. All other hard-to-detect tests were done by a contract laboratory.

Fish types tested in 2010 included yellow perch, pumpkinseed, bluegill and large and small mouth bass. Nineteen fish samples were tested in 2010. Not all samples were tested for all types of radioactive materials. Fish gamma spectroscopy results are presented in Table 22 and hard-to-detect results are in Table 23.

Potassium-40, cesium-137 and strontium-90 were measured in the fish in 2010. Potassium-40, a naturally-occurring radioactive material was detected in all fish. The cesium-137 results are within the historical range of less than the lower limit of detection to 100 picocuries per kilogram (pCi/kg). No historical range has been established for strontium-90 in Vermont fish. The levels of strontium-90 measured in these fish did not pose a health risk. The levels found did not measurably increase the public's exposure to radiation. The levels of cesium-137 and strontium-90 measured may be attributed to the fallout from above-ground weapons testing and global nuclear incidents like Chernobyl.

Table 22. 2010 Connecticut River Fish Gamma Spectroscopy Results

Month Sample Collected	Location Sampled	Edible (flesh) [1]		Inedible (bones, head, scales, guts) [1]		Whole fish [2]	
		Potassium-40 +/- error (pCi/kg)	Cesium-137 +/- error (pCi/kg)	Potassium-40 +/- error (pCi/kg)	Cesium-137 +/- error (pCi/kg)	Potassium-40 +/- error (pCi/kg)	Cesium-137 +/- error (pCi/kg)
February 2010	Near VY Discharge					2,500 +/- 460	< LLD
	Upstream of VY					2,260 +/- 420	< LLD
April/May 2010	Near VY Discharge					2,090 +/- 400	< LLD
	Upstream of VY					2,640 +/- 520	< LLD
July 2010	Near VY Discharge	2,630 +/- 298	11 +/- 7	2,980 +/- 361	15 +/- 10		
	Upstream of VY	2,150 +/- 510	< LLD	2,680 +/- 408	< LLD		
September 2010	Near VY Discharge	3,610 +/- 428	18 +/- 12	2,730 +/- 365	< LLD		
	Upstream of VY	3,490 +/- 434	21 +/- 9	3,100 +/- 403	< LLD		
October 2010	Near VY Discharge					2,610 +/- 470	< LLD
	Upstream of VY					2,880 +/- 510	< LLD
November 2010	Near VY Discharge	2,990 +/- 744	< LLD	2,850 +/- 528	< LLD		
	Upstream of VY	3,700 +/- 708	< LLD	2,410 +/- 403	< LLD		

< LLD means less than the Laboratory's Lower Limit of Detection

1. Edible and Inedible fish portions were tested by contract laboratory

2. Whole fish were tested by the Health Department Laboratory

Table 23. 2010 Connecticut River Fish Hard-to-Detect Results

Month Sample Collected	Location Sampled	Edible (flesh)				Inedible (bones, head, scales, guts)			
		Iron-55 +/- error (pCi/kg)	Nickel-63 +/- error (pCi/kg)	Strontium-89 +/- error (pCi/kg)	Strontium-90 +/- error (pCi/kg)	Iron-55 +/- error (pCi/kg)	Nickel-63 +/- error (pCi/kg)	Strontium-89 +/- error (pCi/kg)	Strontium-90 +/- error (pCi/kg)
February 2010	Near VY Discharge	N/A	N/A	N/A	< LLD	N/A	N/A	N/A	47 +/- 16
	Upstream of VY	N/A	N/A	N/A	< LLD	N/A	N/A	N/A	30 +/- 17
April/May 2010	Near VY Discharge	N/A	N/A	N/A	< LLD	N/A	N/A	N/A	50 +/- 18
	Upstream of VY	N/A	N/A	N/A	< LLD	N/A	N/A	N/A	77 +/- 16
June 2010	Near VY Discharge	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	84 +/- 34
	Near VY Discharge	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	Upstream of VY	< LLD	< LLD	< LLD	58 +/- 35	< LLD	< LLD	< LLD	255 +/- 48
July 2010	Near VY Discharge	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	Upstream of VY	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	65 +/- 37
August 2010	Near VY Discharge	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	Upstream of VY	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	28 +/- 19
September 2010	Near VY Discharge	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	Upstream of VY	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	51 +/- 35
October 2010	Near VY Discharge	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	Upstream of VY	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	101 +/- 31
November 2010	Near VY Discharge	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	Near VY Discharge	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	Upstream of VY	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD
	Upstream of VY	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	< LLD	79 +/- 32

< LLD means less than the Laboratory's Lower Limit of Detection
N/A = samples were not tested for iron-55, nickel-63, strontium-89

In 2010, no radioactivity in food chain inputs was measured above historical and background ranges. Radioactivity measured in the food chain inputs may be attributed to natural or human-made sources released in above-ground weapons testing or global nuclear incidents.

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Appendix A

2010 Tritium Water Data

Tritium results for all water samples tested by the Health Department in 2010 are provided in this appendix. Results are presented in alphabetical order by sample location and by sampling date based on the following categories:

- Connecticut River samples
- On-site groundwater monitoring wells
- Off-site drinking water wells
- On-site drinking water wells[1]

The Health Department's Lower Limit of Detection for tritium is 500 picocuries per liter (pCi/L).

[1] Note: the COB well was off-line as a drinking water well as of February 25, 2010.

Sample Location	Date of Sample	Tritium Result (pCi/L)
3-3 Connecticut River Station	1/13/2010	< 500
3-3 Connecticut River Station	2/15/2010	< 500
3-3 Connecticut River Station	3/13/2010	< 500
3-3 Connecticut River Station	4/14/2010	< 500
3-3 Connecticut River Station	5/13/2010	< 500
3-3 Connecticut River Station	6/15/2010	< 500
3-3 Connecticut River Station	7/14/2010	< 500
3-3 Connecticut River Station	8/17/2010	< 500
3-3 Connecticut River Station	9/15/2010	< 500
3-3 Connecticut River Station	10/14/2010	< 500
3-3 Connecticut River Station	11/16/2010	< 500
3-3 Connecticut River Station	12/16/2010	< 500
3-4 Connecticut River Station	1/13/2010	< 500
3-4 Connecticut River Station	2/15/2010	< 500
3-4 Connecticut River Station	3/13/2010	< 500
3-4 Connecticut River Station	4/14/2010	< 500
3-4 Connecticut River Station	5/13/2010	< 500
3-4 Connecticut River Station	6/15/2010	< 500
3-4 Connecticut River Station	7/14/2010	< 500
3-4 Connecticut River Station	8/17/2010	< 500
3-4 Connecticut River Station	9/15/2010	< 500
3-4 Connecticut River Station	10/14/2010	< 500
3-4 Connecticut River Station	11/16/2010	< 500
3-4 Connecticut River Station	12/16/2010	< 500
3-8 Connecticut River Station	1/13/2010	< 500
3-8 Connecticut River Station	2/15/2010	< 500
3-8 Connecticut River Station	3/13/2010	< 500
3-8 Connecticut River Station	4/14/2010	< 500
3-8 Connecticut River Station	5/13/2010	< 500
3-8 Connecticut River Station	6/15/2010	< 500
3-8 Connecticut River Station	7/14/2010	< 500

Sample Location	Date of Sample	Tritium Result (pCi/L)
3-8 Connecticut River Station	8/17/2010	< 500
3-8 Connecticut River Station	9/15/2010	< 500
3-8 Connecticut River Station	10/14/2010	< 500
3-8 Connecticut River Station	11/16/2010	< 500
3-8 Connecticut River Station	12/16/2010	< 500
Discharge Forebay	1/13/2010	< 500
Discharge Forebay	2/15/2010	< 500
Discharge Forebay	3/13/2010	< 500
Discharge Forebay	4/14/2010	< 500
Discharge Forebay	5/13/2010	< 500
Discharge Forebay	6/15/2010	< 500
Discharge Forebay	7/14/2010	< 500
Discharge Forebay	8/17/2010	< 500
Discharge Forebay	9/15/2010	< 500
Discharge Forebay	10/14/2010	< 500
Discharge Forebay	11/16/2010	< 500
Discharge Forebay	12/16/2010	< 500
Connecticut River Downstream	1/8/2010	< 500
Connecticut River Downstream	1/21/2010	< 500
Connecticut River Downstream	1/25/2010	< 500
Connecticut River Downstream	1/27/2010	< 500
Connecticut River Downstream	2/1/2010	< 500
Connecticut River Downstream	2/2/2010	< 500
Connecticut River Downstream	2/8/2010	< 500
Connecticut River Downstream	2/9/2010	< 500
Connecticut River Downstream	2/16/2010	< 500
Connecticut River Downstream	2/16/2010	< 500
Connecticut River Downstream	2/22/2010	< 500
Connecticut River Downstream	2/23/2010	< 500
Connecticut River Downstream	3/3/2010	< 500
Connecticut River Downstream	3/3/2010	< 500

Sample Location	Date of Sample	Tritium Result (pCi/L)
Connecticut River Downstream	3/9/2010	< 500
Connecticut River Downstream	3/10/2010	< 500
Connecticut River Downstream	3/15/2010	< 500
Connecticut River Downstream	3/15/2010	< 500
Connecticut River Downstream	3/22/2010	< 500
Connecticut River Downstream	3/23/2010	< 500
Connecticut River Downstream	3/29/2010	< 500
Connecticut River Downstream	3/30/2010	< 500
Connecticut River Downstream	4/5/2010	< 500
Connecticut River Downstream	4/6/2010	< 500
Connecticut River Downstream	4/12/2010	< 500
Connecticut River Downstream	4/13/2010	< 500
Connecticut River Downstream	4/19/2010	< 500
Connecticut River Downstream	4/27/2010	< 500
Connecticut River Downstream	4/27/2010	< 500
Connecticut River Downstream	5/4/2010	< 500
Connecticut River Downstream	5/25/2010	< 500
Connecticut River Downstream	6/8/2010	< 500
Connecticut River Downstream	6/22/2010	< 500
Connecticut River Downstream	7/6/2010	< 500
Connecticut River Downstream	7/20/2010	< 500
Connecticut River Downstream	8/10/2010	< 500
Connecticut River Downstream	8/24/2010	< 500
Connecticut River Downstream	9/7/2010	< 500
Connecticut River Downstream	9/21/2010	< 500
Connecticut River Downstream	10/5/2010	< 500
Connecticut River Downstream	10/19/2010	< 500
Connecticut River Downstream	11/9/2010	< 500
Connecticut River Downstream	11/22/2010	< 500
Connecticut River Downstream	12/7/2010	< 500
Connecticut River Downstream	12/21/2010	< 500

Sample Location	Date of Sample	Tritium Result (pCi/L)
Connecticut River Upstream	1/21/2010	< 500
Connecticut River Upstream	1/27/2010	< 500
Connecticut River Upstream	2/9/2010	< 500
Connecticut River Upstream	2/16/2010	< 500
Connecticut River Upstream	2/23/2010	< 500
Connecticut River Upstream	3/3/2010	< 500
Connecticut River Upstream	3/9/2010	< 500
Connecticut River Upstream	3/15/2010	< 500
Connecticut River Upstream	3/23/2010	< 500
Connecticut River Upstream	3/30/2010	< 500
Connecticut River Upstream	4/6/2010	< 500
Connecticut River Upstream	4/13/2010	< 500
Connecticut River Upstream	4/19/2010	< 500
Connecticut River Upstream	4/27/2010	< 500
Connecticut River Upstream	5/4/2010	< 500
Connecticut River Upstream	5/25/2010	< 500
Connecticut River Upstream	6/8/2010	< 500
Connecticut River Upstream	6/22/2010	< 500
Connecticut River Upstream	7/6/2010	< 500
Connecticut River Upstream	7/20/2010	< 500
Connecticut River Upstream	8/10/2010	< 500
Connecticut River Upstream	8/24/2010	< 500
Connecticut River Upstream	9/7/2010	< 500
Connecticut River Upstream	9/21/2010	< 500
Connecticut River Upstream	10/5/2010	< 500
Connecticut River Upstream	10/19/2010	< 500
Connecticut River Upstream	11/9/2010	< 500
Connecticut River Upstream	11/22/2010	< 500
Connecticut River Upstream	12/7/2010	< 500
Connecticut River Upstream	12/21/2010	< 500
Upstream of the VY River Discharge	1/11/2010	< 500

Sample Location	Date of Sample	Tritium Result (pCi/L)
Upstream of the VY River Discharge	1/18/2010	< 500
Upstream of the VY River Discharge	1/25/2010	< 500
Upstream of the VY River Discharge	2/1/2010	< 500
Upstream of the VY River Discharge	2/8/2010	< 500
Upstream of the VY River Discharge	2/13/2010	< 500
Upstream of the VY River Discharge	2/14/2010	< 500
Upstream of the VY River Discharge	2/16/2010	< 500
Upstream of the VY River Discharge	2/17/2010	< 500
Upstream of the VY River Discharge	2/18/2010	< 500
Upstream of the VY River Discharge	2/18/2010	< 500
Upstream of the VY River Discharge	2/19/2010	< 500
Upstream of the VY River Discharge	2/19/2010	< 500
Upstream of the VY River Discharge	2/20/2010	< 500
Upstream of the VY River Discharge	2/21/2010	< 500
Upstream of the VY River Discharge	2/22/2010	< 500
Upstream of the VY River Discharge	2/23/2010	< 500
Upstream of the VY River Discharge	2/24/2010	< 500
Upstream of the VY River Discharge	2/25/2010	< 500
Upstream of the VY River Discharge	2/26/2010	< 500
Upstream of the VY River Discharge	2/27/2010	< 500
Upstream of the VY River Discharge	2/28/2010	< 500
Upstream of the VY River Discharge	3/1/2010	< 500
Upstream of the VY River Discharge	3/2/2010	< 500
Upstream of the VY River Discharge	3/3/2010	< 500
Upstream of the VY River Discharge	3/5/2010	< 500
Upstream of the VY River Discharge	3/8/2010	< 500
Upstream of the VY River Discharge	3/15/2010	< 500
Upstream of the VY River Discharge	3/22/2010	< 500
Upstream of the VY River Discharge	3/29/2010	< 500
Upstream of the VY River Discharge	4/5/2010	< 500
Upstream of the VY River Discharge	4/12/2010	< 500

Sample Location	Date of Sample	Tritium Result (pCi/L)
Upstream of the VY River Discharge	4/19/2010	< 500
Upstream of the VY River Discharge	4/26/2010	< 500
Upstream of the VY River Discharge	5/3/2010	< 500
Upstream of the VY River Discharge	5/10/2010	< 500
Upstream of the VY River Discharge	5/17/2010	< 500
Upstream of the VY River Discharge	5/24/2010	< 500
Upstream of the VY River Discharge	6/1/2010	< 500
Upstream of the VY River Discharge	6/7/2010	< 500
Upstream of the VY River Discharge	6/14/2010	< 500
Upstream of the VY River Discharge	6/21/2010	< 500
Upstream of the VY River Discharge	6/28/2010	< 500
Upstream of the VY River Discharge	7/6/2010	< 500
Upstream of the VY River Discharge	7/12/2010	< 500
Upstream of the VY River Discharge	7/19/2010	< 500
Upstream of the VY River Discharge	7/26/2010	< 500
Upstream of the VY River Discharge	8/2/2010	< 500
Upstream of the VY River Discharge	8/19/2010	< 500
Upstream of the VY River Discharge	9/7/2010	< 500
Upstream of the VY River Discharge	9/13/2010	< 500
Upstream of the VY River Discharge	9/20/2010	< 500
Upstream of the VY River Discharge	9/29/2010	< 500
Upstream of the VY River Discharge	10/4/2010	< 500
Upstream of the VY River Discharge	10/12/2010	< 500
Upstream of the VY River Discharge	10/18/2010	< 500
Upstream of the VY River Discharge	10/25/2010	< 500
Upstream of the VY River Discharge	11/1/2010	< 500
Upstream of the VY River Discharge	11/8/2010	< 500
Upstream of the VY River Discharge	12/6/2010	< 500

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-01	1/7/2010	< 500	
GZ-01	1/11/2010	< 500	
GZ-01	1/14/2010	< 500	
GZ-01	1/18/2010	< 500	
GZ-01	1/25/2010	< 500	
GZ-01	2/1/2010	< 500	
GZ-01	2/8/2010	< 500	
GZ-01	2/16/2010	< 500	
GZ-01	3/22/2010	< 500	
GZ-01	6/2/2010	< 500	
GZ-01	8/2/2010	< 500	
GZ-01	10/4/2010	< 500	
GZ-01	11/1/2010	< 500	
GZ-02	2/8/2010	< 500	
GZ-02	2/16/2010	< 500	
GZ-02	3/26/2010	< 500	
GZ-02	4/5/2010	< 500	
GZ-02	5/3/2010	< 500	
GZ-02	6/2/2010	< 500	
GZ-02	6/28/2010	< 500	
GZ-02	8/2/2010	< 500	
GZ-02	9/7/2010	< 500	
GZ-02	10/4/2010	< 500	
GZ-02	11/1/2010	< 500	
GZ-02	12/6/2010	< 500	
GZ-03	1/7/2010	13,800	300
GZ-03	1/11/2010	18,300	300
GZ-03	1/25/2010	16,300	400
GZ-03	2/1/2010	25,500	500
GZ-03	2/8/2010	21,200	500
GZ-03	2/16/2010	41,900	600

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-03	2/22/2010	40,200	600
GZ-03	3/1/2010	30,500	500
GZ-03	3/8/2010	36,500	600
GZ-03	3/15/2010	42,400	600
GZ-03	3/22/2010	54,600	600
GZ-03	3/29/2010	51,900	600
GZ-03	4/5/2010	61,900	700
GZ-03	4/12/2010	54,900	600
GZ-03	4/19/2010	65,800	700
GZ-03	4/26/2010	98,700	800
GZ-03	5/3/2010	107,000	1,000
GZ-03	5/10/2010	127,000	1,000
GZ-03	5/17/2010	148,000	1,000
GZ-03	5/24/2010	172,000	1,000
GZ-03	6/1/2010	161,000	1,000
GZ-03	6/7/2010	161,000	1,000
GZ-03	6/14/2010	149,000	1,000
GZ-03	6/21/2010	149,000	1,000
GZ-03	6/28/2010	146,000	1,000
GZ-03	7/6/2010	137,000	1,000
GZ-03	7/12/2010	135,000	1,000
GZ-03	7/19/2010	129,000	1,000
GZ-03	7/26/2010	126,000	1,000
GZ-03	8/2/2010	121,000	1,000
GZ-03	8/19/2010	119,000	1,000
GZ-03	9/7/2010	110,000	1,000
GZ-03	10/4/2010	115,000	1,000
GZ-03	11/1/2010	146,000	1,000
GZ-03	12/6/2010	175,000	1,000
GZ-04	2/1/2010	1,730	260
GZ-04	2/8/2010	2,470	270

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-04	2/16/2010	2,100	270
GZ-04	2/22/2010	2,240	270
GZ-04	3/1/2010	2,270	270
GZ-04	3/8/2010	1,770	260
GZ-04	3/15/2010	2,150	230
GZ-04	3/22/2010	2,260	230
GZ-04	3/29/2010	1,970	230
GZ-04	4/5/2010	2,310	230
GZ-04	4/12/2010	2,230	230
GZ-04	4/19/2010	2,590	240
GZ-04	4/26/2010	2,940	240
GZ-04	5/3/2010	3,820	250
GZ-04	5/10/2010	4,860	260
GZ-04	5/17/2010	8,030	300
GZ-04	5/24/2010	10,900	300
GZ-04	6/1/2010	12,800	300
GZ-04	6/7/2010	21,000	400
GZ-04	6/14/2010	20,900	400
GZ-04	6/21/2010	26,700	500
GZ-04	6/28/2010	28,200	500
GZ-04	7/6/2010	29,000	500
GZ-04	7/12/2010	33,700	500
GZ-04	7/19/2010	32,400	500
GZ-04	7/26/2010	33,300	500
GZ-04	8/2/2010	30,800	500
GZ-04	8/19/2010	40,900	500
GZ-04	9/7/2010	42,500	600
GZ-04	10/4/2010	57,400	600
GZ-04	11/1/2010	58,400	600
GZ-04	12/6/2010	73,000	700

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-05	1/7/2010	< 500	
GZ-05	1/11/2010	< 500	
GZ-05	1/14/2010	< 500	
GZ-05	1/18/2010	< 500	
GZ-05	1/25/2010	< 500	
GZ-05	2/1/2010	< 500	
GZ-05	2/8/2010	< 500	
GZ-05	2/16/2010	< 500	
GZ-05	2/22/2010	< 500	
GZ-05	3/1/2010	< 500	
GZ-05	3/8/2010	< 500	
GZ-05	3/15/2010	< 500	
GZ-05	3/22/2010	< 500	
GZ-05	3/29/2010	< 500	
GZ-05	4/5/2010	< 500	
GZ-05	4/12/2010	< 500	
GZ-05	4/19/2010	< 500	
GZ-05	4/26/2010	< 500	
GZ-05	5/3/2010	< 500	
GZ-05	5/10/2010	< 500	
GZ-05	5/17/2010	< 500	
GZ-05	5/24/2010	< 500	
GZ-05	6/1/2010	< 500	
GZ-05	6/7/2010	< 500	
GZ-05	6/14/2010	< 500	
GZ-05	6/21/2010	< 500	
GZ-05	6/28/2010	< 500	
GZ-05	8/2/2010	< 500	
GZ-05	9/7/2010	< 500	
GZ-05	10/4/2010	< 500	
GZ-05	11/1/2010	< 500	
GZ-05	12/6/2010	< 500	

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-06	2/1/2010	< 500	
GZ-06	2/8/2010	< 500	
GZ-06	2/16/2010	< 500	
GZ-06	2/22/2010	< 500	
GZ-06	3/1/2010	< 500	
GZ-06	3/8/2010	< 500	
GZ-06	3/15/2010	< 500	
GZ-06	3/22/2010	< 500	
GZ-06	3/29/2010	< 500	
GZ-06	4/5/2010	< 500	
GZ-06	4/12/2010	< 500	
GZ-06	4/19/2010	< 500	
GZ-06	4/26/2010	< 500	
GZ-06	5/3/2010	< 500	
GZ-06	5/10/2010	< 500	
GZ-06	5/17/2010	< 500	
GZ-06	6/28/2010	< 500	
GZ-06	7/12/2010	< 500	
GZ-06	7/19/2010	< 500	
GZ-06	7/26/2010	< 500	
GZ-06	8/2/2010	< 500	
GZ-06	9/7/2010	< 500	
GZ-06	10/4/2010	< 500	
GZ-06	11/2/2010	< 500	
GZ-06	12/6/2010	627	201
GZ-07	2/8/2010	955,000	4,000
GZ-07	2/16/2010	1,009,000	4,000
GZ-07	2/22/2010	943,000	4,000
GZ-07	3/1/2010	923,000	3,000
GZ-07	3/8/2010	1,126,000	4,000
GZ-07	3/15/2010	1,110,000	4,000

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-07	3/22/2010	925,000	3,000
GZ-07	3/29/2010	1,231,000	4,000
GZ-07	4/5/2010	869,000	3,000
GZ-07	4/12/2010	979,000	4,000
GZ-07	4/19/2010	507,000	3,000
GZ-07	4/26/2010	197,000	1,000
GZ-07	5/3/2010	119,000	1,000
GZ-07	5/10/2010	136,000	1,000
GZ-07	5/17/2010	88,900	800
GZ-07	5/24/2010	66,300	700
GZ-07	6/1/2010	22,300	400
GZ-07	6/7/2010	7,350	290
GZ-07	6/21/2010	4,170	250
GZ-07	6/28/2010	7,810	300
GZ-07	7/6/2010	5,810	270
GZ-07	7/12/2010	2,980	240
GZ-07	7/19/2010	2,510	230
GZ-07	8/2/2010	8,320	300
GZ-07	8/19/2010	4,260	260
GZ-07	9/7/2010	5,880	270
GZ-07	10/4/2010	3,320	240
GZ-07	11/1/2010	4,140	250
GZ-07	12/6/2010	3,660	240
GZ-09	2/8/2010	< 500	
GZ-09	2/16/2010	< 500	
GZ-09	2/22/2010	< 500	
GZ-09	3/1/2010	< 500	
GZ-09	3/8/2010	< 500	
GZ-09	3/15/2010	< 500	
GZ-09	3/22/2010	< 500	
GZ-09	4/5/2010	< 500	

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-09	4/12/2010	< 500	
GZ-09	4/19/2010	< 500	
GZ-09	4/26/2010	< 500	
GZ-09	5/3/2010	< 500	
GZ-09	5/10/2010	< 500	
GZ-09	5/17/2010	< 500	
GZ-09	5/24/2010	< 500	
GZ-09	6/1/2010	< 500	
GZ-09	6/14/2010	< 500	
GZ-09	6/21/2010	< 500	
GZ-09	6/28/2010	< 500	
GZ-09	8/2/2010	< 500	
GZ-09	9/7/2010	< 500	
GZ-09	10/4/2010	< 500	
GZ-09	11/1/2010	< 500	
GZ-09	12/6/2010	< 500	
GZ-10	2/8/2010	2,651,000	6,000
GZ-10	2/16/2010	2,144,000	5,000
GZ-10	2/22/2010	1,832,000	5,000
GZ-10	3/1/2010	1,566,000	5,000
GZ-10	3/8/2010	635,000	3,000
GZ-10	3/15/2010	203,000	2,000
GZ-10	3/22/2010	41,100	600
GZ-10	3/29/2010	6,080	290
GZ-10	4/5/2010	2,080	240
GZ-10	4/12/2010	1,660	230
GZ-10	4/19/2010	1,030	220
GZ-10	4/26/2010	955	215
GZ-10	5/3/2010	896	222
GZ-10	5/10/2010	636	209
GZ-10	5/17/2010	< 500	

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-10	5/24/2010	< 500	
GZ-10	6/1/2010	< 500	
GZ-10	6/7/2010	< 500	
GZ-10	6/14/2010	< 500	
GZ-10	6/21/2010	< 500	
GZ-10	6/28/2010	< 500	
GZ-10	7/6/2010	< 500	
GZ-10	7/12/2010	< 500	
GZ-10	7/19/2010	< 500	
GZ-10	7/26/2010	< 500	
GZ-10	8/2/2010	< 500	
GZ-10	8/19/2010	< 500	
GZ-10	9/7/2010	< 500	
GZ-10	10/4/2010	< 500	
GZ-10	11/2/2010	< 500	
GZ-10	12/6/2010	< 500	
GZ-11	2/8/2010	< 500	
GZ-11	2/16/2010	< 500	
GZ-11	2/22/2010	< 500	
GZ-11	3/1/2010	< 500	
GZ-11	3/8/2010	< 500	
GZ-11	3/15/2010	< 500	
GZ-11	3/22/2010	532	245
GZ-11	3/29/2010	< 500	
GZ-11	4/5/2010	526	244
GZ-11	4/12/2010	< 500	
GZ-11	4/19/2010	< 500	
GZ-11	4/26/2010	< 500	
GZ-11	5/3/2010	< 500	
GZ-11	5/10/2010	< 500	
GZ-11	5/17/2010	551	204

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-11	5/24/2010	< 500	
GZ-11	6/1/2010	< 500	
GZ-11	6/7/2010	< 500	
GZ-11	6/14/2010	< 500	
GZ-11	6/21/2010	523	204
GZ-11	6/28/2010	< 500	
GZ-11	7/6/2010	< 500	
GZ-11	7/12/2010	< 500	
GZ-11	7/19/2010	< 500	
GZ-11	7/26/2010	561	202
GZ-11	8/2/2010	554	201
GZ-11	9/7/2010	< 500	
GZ-11	10/4/2010	< 500	
GZ-11	11/1/2010	< 500	
GZ-11	12/6/2010	< 500	
GZ-12S	2/8/2010	21,700	500
GZ-12S	2/16/2010	17,600	400
GZ-12S	2/22/2010	27,300	500
GZ-12S	3/1/2010	17,500	400
GZ-12S	3/8/2010	56,500	700
GZ-12S	3/15/2010	128,000	1,000
GZ-12S	3/22/2010	215,000	1,000
GZ-12S	3/29/2010	288,000	1,000
GZ-12S	4/5/2010	356,000	2,000
GZ-12S	4/12/2010	434,000	2,000
GZ-12S	4/19/2010	545,000	3,000
GZ-12S	4/26/2010	532,000	3,000
GZ-12S	5/3/2010	701,000	3,000
GZ-12S	5/10/2010	493,000	3,000
GZ-12S	5/17/2010	382,000	2,000
GZ-12S	5/24/2010	374,000	2,000

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-12S	6/1/2010	188,000	1,000
GZ-12S	6/7/2010	152,000	1,000
GZ-12S	6/14/2010	125,000	1,000
GZ-12S	6/21/2010	99,400	800
GZ-12S	6/28/2010	125,000	1,000
GZ-12S	7/6/2010	71,700	700
GZ-12S	7/12/2010	79,700	700
GZ-12S	7/19/2010	58,100	600
GZ-12S	7/26/2010	57,400	600
GZ-12S	8/2/2010	33,800	500
GZ-12S	8/19/2010	28,800	500
GZ-12S	9/7/2010	23,200	400
GZ-12S	10/4/2010	16,300	400
GZ-12S	11/1/2010	9,460	310
GZ-12S	12/6/2010	4,770	260
GZ-12D	12/6/2010	73,900	700
GZ-13S	2/8/2010	< 500	
GZ-13S	2/16/2010	< 500	
GZ-13S	2/22/2010	< 500	
GZ-13S	3/1/2010	< 500	
GZ-13S	3/8/2010	< 500	
GZ-13S	3/15/2010	< 500	
GZ-13S	3/22/2010	< 500	
GZ-13S	3/29/2010	< 500	
GZ-13S	4/5/2010	< 500	
GZ-13S	4/12/2010	< 500	
GZ-13S	4/19/2010	< 500	
GZ-13S	4/26/2010	< 500	
GZ-13S	5/3/2010	< 500	
GZ-13S	5/10/2010	< 500	
GZ-13S	5/17/2010	< 500	

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-13S	5/24/2010	< 500	
GZ-13S	6/1/2010	< 500	
GZ-13S	6/7/2010	< 500	
GZ-13S	6/14/2010	< 500	
GZ-13S	6/21/2010	< 500	
GZ-13S	6/28/2010	< 500	
GZ-13S	7/6/2010	< 500	
GZ-13S	7/12/2010	< 500	
GZ-13S	7/19/2010	< 500	
GZ-13S	7/26/2010	< 500	
GZ-13S	8/2/2010	< 500	
GZ-13S	8/19/2010	< 500	
GZ-13S	9/7/2010	< 500	
GZ-13S	10/4/2010	< 500	
GZ-13S	11/1/2010	< 500	
GZ-13S	12/6/2010	< 500	
GZ-13D	3/8/2010	1,230	210
GZ-13D	3/15/2010	1,220	250
GZ-13D	3/22/2010	1,190	250
GZ-13D	3/29/2010	1,200	230
GZ-13D	4/5/2010	1,090	230
GZ-13D	4/12/2010	865	222
GZ-13D	4/19/2010	918	223
GZ-13D	4/26/2010	567	209
GZ-13D	5/3/2010	732	219
GZ-13D	5/10/2010	550	217
GZ-13D	5/17/2010	679	206
GZ-13D	5/24/2010	718	217
GZ-13D	6/1/2010	705	206
GZ-13D	6/7/2010	876	209
GZ-13D	6/14/2010	553	204

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-13D	6/21/2010	< 500	
GZ-13D	6/28/2010	672	206
GZ-13D	7/6/2010	658	205
GZ-13D	7/12/2010	687	206
GZ-13D	7/19/2010	817	206
GZ-13D	7/26/2010	904	208
GZ-13D	8/2/2010	1,060	210
GZ-13D	8/19/2010	1,120	210
GZ-13D	9/7/2010	1,270	210
GZ-13D	10/4/2010	1,050	200
GZ-13D	11/1/2010	968	207
GZ-13D	12/6/2010	1,080	210
GZ-14S	2/1/2010	52,900	700
GZ-14S	2/8/2010	78,100	800
GZ-14S	2/16/2010	83,800	800
GZ-14S	2/22/2010	96,100	900
GZ-14S	3/1/2010	118,000	1,000
GZ-14S	3/8/2010	134,000	1,000
GZ-14S	3/15/2010	163,000	1,000
GZ-14S	3/22/2010	197,000	1,000
GZ-14S	3/29/2010	216,000	1,000
GZ-14S	4/5/2010	236,000	1,000
GZ-14S	4/12/2010	268,000	2,000
GZ-14S	4/19/2010	284,000	2,000
GZ-14S	4/26/2010	267,000	2,000
GZ-14S	5/3/2010	218,000	2,000
GZ-14S	5/10/2010	239,000	2,000
GZ-14S	5/17/2010	267,000	2,000
GZ-14S	5/24/2010	291,000	2,000
GZ-14S	6/1/2010	309,000	2,000
GZ-14S	6/7/2010	300,000	2,000

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-14S	6/21/2010	292,000	1,000
GZ-14S	6/28/2010	300,000	1,000
GZ-14S	7/6/2010	306,000	1,000
GZ-14S	7/12/2010	323,000	1,000
GZ-14S	7/19/2010	319,000	1,000
GZ-14S	7/26/2010	312,000	1,000
GZ-14S	8/2/2010	326,000	1,000
GZ-14S	8/19/2010	386,000	2,000
GZ-14S	9/7/2010	386,000	2,000
GZ-14S	10/4/2010	479,000	2,000
GZ-14S	11/1/2010	468,000	2,000
GZ-14S	12/6/2010	462,000	2,000
GZ-14D	3/8/2010	< 500	
GZ-14D	3/15/2010	< 500	
GZ-14D	3/22/2010	< 500	
GZ-14D	3/29/2010	< 500	
GZ-14D	4/5/2010	< 500	
GZ-14D	4/12/2010	< 500	
GZ-14D	4/19/2010	< 500	
GZ-14D	4/26/2010	< 500	
GZ-14D	5/3/2010	< 500	
GZ-14D	5/10/2010	< 500	
GZ-14D	5/17/2010	< 500	
GZ-14D	5/24/2010	< 500	
GZ-14D	6/1/2010	< 500	
GZ-14D	6/7/2010	< 500	
GZ-14D	6/14/2010	< 500	
GZ-14D	6/21/2010	< 500	
GZ-14D	6/28/2010	< 500	
GZ-14D	7/6/2010	< 500	
GZ-14D	7/12/2010	< 500	

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-14D	7/19/2010	< 500	
GZ-14D	7/26/2010	< 500	
GZ-14D	8/2/2010	< 500	
GZ-14D	8/19/2010	< 500	
GZ-14D	9/7/2010	< 500	
GZ-14D	10/4/2010	< 500	
GZ-14D	11/1/2010	< 500	
GZ-14D	12/6/2010	< 500	
GZ-15	2/16/2010	319,000	2,000
GZ-15	2/22/2010	406,000	2,000
GZ-15	3/1/2010	560,000	3,000
GZ-15	3/8/2010	593,000	3,000
GZ-15	3/15/2010	665,000	3,000
GZ-15	3/22/2010	760,000	3,000
GZ-15	3/29/2010	782,000	3,000
GZ-15	4/5/2010	804,000	3,000
GZ-15	4/12/2010	782,000	3,000
GZ-15	4/19/2010	847,000	3,000
GZ-15	4/26/2010	846,000	3,000
GZ-15	5/3/2010	847,000	3,000
GZ-15	5/10/2010	832,000	3,000
GZ-15	5/17/2010	815,000	3,000
GZ-15	5/24/2010	748,000	3,000
GZ-15	6/1/2010	724,000	3,000
GZ-15	6/7/2010	677,000	3,000
GZ-15	6/14/2010	570,000	2,000
GZ-15	6/21/2010	476,000	2,000
GZ-15	7/6/2010	509,000	2,000
GZ-15	7/12/2010	451,000	2,000
GZ-15	7/19/2010	402,000	2,000
GZ-15	7/26/2010	371,000	2,000

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-15	8/19/2010	70,600	700
GZ-15	9/7/2010	53,300	600
GZ-15	10/4/2010	126,000	1,000
GZ-15	11/1/2010	55,100	600
GZ-15	12/6/2010	99,400	800
GZ-16	3/8/2010	< 500	
GZ-16	3/15/2010	< 500	
GZ-16	3/22/2010	< 500	
GZ-16	3/29/2010	< 500	
GZ-16	4/5/2010	< 500	
GZ-16	4/12/2010	< 500	
GZ-16	4/19/2010	< 500	
GZ-16	4/26/2010	< 500	
GZ-16	5/3/2010	< 500	
GZ-16	5/10/2010	< 500	
GZ-16	5/17/2010	< 500	
GZ-16	5/24/2010	< 500	
GZ-16	6/1/2010	< 500	
GZ-16	6/7/2010	< 500	
GZ-16	6/14/2010	< 500	
GZ-16	6/21/2010	< 500	
GZ-16	6/28/2010	< 500	
GZ-16	7/6/2010	< 500	
GZ-16	7/12/2010	< 500	
GZ-16	7/19/2010	< 500	
GZ-16	7/26/2010	< 500	
GZ-16	8/2/2010	< 500	
GZ-16	8/19/2010	< 500	
GZ-16	9/7/2010	< 500	
GZ-16	10/4/2010	< 500	
GZ-16	11/1/2010	< 500	
GZ-16	12/6/2010	< 500	

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-17	3/1/2010	< 500	
GZ-17	3/8/2010	< 500	
GZ-17	3/15/2010	< 500	
GZ-17	3/22/2010	< 500	
GZ-17	3/29/2010	< 500	
GZ-17	4/5/2010	< 500	
GZ-17	4/12/2010	< 500	
GZ-17	4/19/2010	< 500	
GZ-17	4/26/2010	< 500	
GZ-17	5/3/2010	< 500	
GZ-17	5/10/2010	< 500	
GZ-17	5/17/2010	< 500	
GZ-17	5/24/2010	< 500	
GZ-17	6/1/2010	< 500	
GZ-17	6/7/2010	< 500	
GZ-17	6/14/2010	< 500	
GZ-17	6/21/2010	< 500	
GZ-17	6/28/2010	< 500	
GZ-17	8/2/2010	< 500	
GZ-17	9/7/2010	< 500	
GZ-17	10/4/2010	< 500	
GZ-17	11/2/2010	< 500	
GZ-17	12/6/2010	< 500	
GZ-18S	10/4/2010	< 500	
GZ-18S	11/1/2010	< 500	
GZ-18S	12/6/2010	< 500	
GZ-18D	11/1/2010	< 500	
GZ-18D	12/6/2010	< 500	
GZ-19S	3/1/2010	< 500	
GZ-19S	3/8/2010	< 500	
GZ-19S	3/15/2010	< 500	

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-19S	3/22/2010	< 500	
GZ-19S	3/29/2010	< 500	
GZ-19S	4/5/2010	< 500	
GZ-19S	4/12/2010	< 500	
GZ-19S	4/19/2010	< 500	
GZ-19S	4/26/2010	< 500	
GZ-19S	5/3/2010	< 500	
GZ-19S	5/10/2010	< 500	
GZ-19S	5/17/2010	< 500	
GZ-19S	5/24/2010	< 500	
GZ-19S	6/1/2010	< 500	
GZ-19S	6/7/2010	< 500	
GZ-19S	6/14/2010	< 500	
GZ-19S	6/21/2010	< 500	
GZ-19S	6/28/2010	< 500	
GZ-19S	8/2/2010	< 500	
GZ-19S	9/7/2010	< 500	
GZ-19S	10/4/2010	< 500	
GZ-19S	11/1/2010	< 500	
GZ-19D	3/8/2010	< 500	
GZ-19D	3/15/2010	< 500	
GZ-19D	3/22/2010	< 500	
GZ-19D	3/29/2010	< 500	
GZ-19D	4/5/2010	< 500	
GZ-19D	4/12/2010	< 500	
GZ-19D	4/19/2010	< 500	
GZ-19D	4/26/2010	< 500	
GZ-19D	5/3/2010	< 500	
GZ-19D	5/10/2010	< 500	
GZ-19D	5/17/2010	< 500	
GZ-19D	5/24/2010	< 500	

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-19D	6/1/2010	< 500	
GZ-19D	6/7/2010	< 500	
GZ-19D	6/14/2010	< 500	
GZ-19D	6/21/2010	< 500	
GZ-19D	6/28/2010	< 500	
GZ-19D	8/2/2010	< 500	
GZ-19D	9/7/2010	< 500	
GZ-19D	10/4/2010	< 500	
GZ-19D	11/1/2010	< 500	
GZ-20	3/15/2010	504,000	3,000
GZ-20	3/22/2010	265,000	2,000
GZ-20	3/29/2010	113,000	1,000
GZ-20	4/5/2010	132,000	1,000
GZ-20	4/12/2010	173,000	1,000
GZ-20	4/19/2010	79,600	700
GZ-20	4/26/2010	38,200	500
GZ-20	5/3/2010	27,900	500
GZ-20	5/10/2010	18,400	400
GZ-20	5/17/2010	10,800	300
GZ-20	5/24/2010	4,860	260
GZ-20	6/1/2010	4,930	260
GZ-20	6/7/2010	3,750	250
GZ-20	6/14/2010	3,850	250
GZ-20	6/21/2010	2,730	240
GZ-20	6/28/2010	2,170	230
GZ-20	7/6/2010	1,710	220
GZ-20	7/12/2010	1,440	210
GZ-20	7/19/2010	1,440	220
GZ-20	7/26/2010	1,110	210
GZ-20	8/2/2010	1,400	220
GZ-20	8/19/2010	2,840	240

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-20	9/7/2010	1,850	220
GZ-20	10/4/2010	815	206
GZ-20	11/1/2010	1,490	210
GZ-20	12/6/2010	843	201
GZ-21	3/15/2010	37,100	800
GZ-21	3/22/2010	1,755,000	5,000
GZ-21	3/29/2010	1,358,000	4,000
GZ-21	4/5/2010	2,037,000	5,000
GZ-21	4/12/2010	2,048,000	5,000
GZ-21	4/19/2010	1,815,000	5,000
GZ-21	4/26/2010	1,665,000	5,000
GZ-21	5/3/2010	1,467,000	4,000
GZ-21	5/10/2010	1,333,000	4,000
GZ-21	5/17/2010	1,188,000	4,000
GZ-21	5/24/2010	1,107,000	4,000
GZ-21	6/1/2010	1,088,000	4,000
GZ-21	6/7/2010	696,000	3,000
GZ-21	6/14/2010	495,000	2,000
GZ-21	6/21/2010	412,000	2,000
GZ-21	6/28/2010	259,000	1,000
GZ-21	7/6/2010	242,000	1,000
GZ-21	7/12/2010	176,000	1,000
GZ-21	7/19/2010	158,000	1,000
GZ-21	7/26/2010	83,700	800
GZ-21	8/2/2010	74,900	700
GZ-21	8/19/2010	38,800	500
GZ-21	9/7/2010	26,900	500
GZ-21	10/4/2010	17,100	4,000
GZ-21	11/1/2010	13,300	300
GZ-21	12/6/2010	11,300	300
GZ-22D	12/6/2010	528,000	2,000

Sample Location	Date of Sample	Tritium Result (pCi/L)	+/- error
GZ-23S	12/6/2010	< 500	
GZ-24S	12/6/2010	< 500	
GZ-25S	12/6/2010	< 500	
GZ-26S	12/6/2010	< 500	
GZ-27S	12/6/2010	< 500	
WVN0201	3/22/2010	< 500	
WVN0201	6/2/2010	< 500	
WVN0201	8/3/2010	< 500	
WVN0201	11/4/2010	< 500	
WVN0202	3/22/2010	< 500	
WVN0202	6/2/2010	< 500	
WVN0202	8/3/2010	< 500	
WVN0202	11/4/2010	< 500	
WVN0203	3/22/2010	< 500	
WVN0203	6/2/2010	< 500	
WVN0203	8/3/2010	< 500	
WVN0203	11/4/2010	< 500	
WVN0204	3/22/2010	< 500	
WVN0204	6/2/2010	< 500	
WVN0204	8/3/2010	< 500	
WVN0204	11/3/2010	< 500	

Sample Location	Date of Sample	Tritium Result (pCi/L)
Blodgett Farm	1/8/2010	< 500
Blodgett Farm	1/21/2010	< 500
Blodgett Farm	1/27/2010	< 500
Blodgett Farm	2/2/2010	< 500
Blodgett Farm	2/9/2010	< 500
Blodgett Farm	2/16/2010	< 500
Blodgett Farm	2/23/2010	< 500
Blodgett Farm	3/3/2010	< 500
Blodgett Farm	3/9/2010	< 500
Blodgett Farm	3/15/2010	< 500
Blodgett Farm	3/23/2010	< 500
Blodgett Farm	3/30/2010	< 500
Blodgett Farm	4/6/2010	< 500
Blodgett Farm	4/19/2010	< 500
Blodgett Farm	4/27/2010	< 500
Blodgett Farm	5/4/2010	< 500
Blodgett Farm	5/25/2010	< 500
Blodgett Farm	6/8/2010	< 500
Blodgett Farm	6/22/2010	< 500
Blodgett Farm	7/6/2010	< 500
Blodgett Farm	7/20/2010	< 500
Blodgett Farm	8/10/2010	< 500
Blodgett Farm	8/24/2010	< 500
Blodgett Farm	9/7/2010	< 500
Blodgett Farm	9/21/2010	< 500
Blodgett Farm	10/5/2010	< 500
Blodgett Farm	10/19/2010	< 500
Blodgett Farm	11/9/2010	< 500
Blodgett Farm	11/22/2010	< 500
Blodgett Farm	12/7/2010	< 500
Blodgett Farm	12/21/2010	< 500
Brattleboro Fire Dept, West Station	1/8/2010	< 500
Brattleboro Fire Dept, West Station	1/21/2010	< 500

Sample Location	Date of Sample	Tritium Result (pCi/L)
Brattleboro Fire Dept, West Station	1/27/2010	< 500
Brattleboro Fire Dept, West Station	2/2/2010	< 500
Brattleboro Fire Dept, West Station	2/9/2010	< 500
Brattleboro Fire Dept, West Station	2/16/2010	< 500
Brattleboro Fire Dept, West Station	2/23/2010	< 500
Brattleboro Fire Dept, West Station	3/3/2010	< 500
Brattleboro Fire Dept, West Station	3/9/2010	< 500
Brattleboro Fire Dept, West Station	3/15/2010	< 500
Brattleboro Fire Dept, West Station	3/23/2010	< 500
Brattleboro Fire Dept, West Station	3/30/2010	< 500
Brattleboro Fire Dept, West Station	4/6/2010	< 500
Brattleboro Fire Dept, West Station	4/13/2010	< 500
Brattleboro Fire Dept, West Station	4/19/2010	< 500
Brattleboro Fire Dept, West Station	4/27/2010	< 500
Brattleboro Fire Dept, West Station	5/4/2010	< 500
Brattleboro Fire Dept, West Station	5/25/2010	< 500
Brattleboro Fire Dept, West Station	6/8/2010	< 500
Brattleboro Fire Dept, West Station	6/22/2010	< 500
Brattleboro Fire Dept, West Station	7/6/2010	< 500
Brattleboro Fire Dept, West Station	7/20/2010	< 500
Brattleboro Fire Dept, West Station	8/10/2010	< 500
Brattleboro Fire Dept, West Station	8/24/2010	< 500
Brattleboro Fire Dept, West Station	9/7/2010	< 500
Brattleboro Fire Dept, West Station	9/21/2010	< 500
Brattleboro Fire Dept, West Station	10/5/2010	< 500
Brattleboro Fire Dept, West Station	10/19/2010	< 500
Brattleboro Fire Dept, West Station	11/9/2010	< 500
Brattleboro Fire Dept, West Station	11/22/2010	< 500
Brattleboro Fire Dept, West Station	12/7/2010	< 500
Brattleboro Fire Dept, West Station	12/21/2010	< 500
Miller Farm	1/8/2010	< 500
Miller Farm	1/21/2010	< 500

Sample Location	Date of Sample	Tritium Result (pCi/L)
Miller Farm	1/27/2010	< 500
Miller Farm	2/2/2010	< 500
Miller Farm	2/9/2010	< 500
Miller Farm	2/16/2010	< 500
Miller Farm	2/23/2010	< 500
Miller Farm	3/3/2010	< 500
Miller Farm	3/9/2010	< 500
Miller Farm	3/15/2010	< 500
Miller Farm	3/23/2010	< 500
Miller Farm	3/30/2010	< 500
Miller Farm	4/6/2010	< 500
Miller Farm	4/13/2010	< 500
Miller Farm	4/19/2010	< 500
Miller Farm	4/27/2010	< 500
Miller Farm	5/4/2010	< 500
Miller Farm	5/25/2010	< 500
Miller Farm	6/8/2010	< 500
Miller Farm	6/22/2010	< 500
Miller Farm	7/6/2010	< 500
Miller Farm	7/20/2010	< 500
Miller Farm	8/10/2010	< 500
Miller Farm	8/24/2010	< 500
Miller Farm	9/7/2010	< 500
Miller Farm	9/21/2010	< 500
Miller Farm	10/5/2010	< 500
Miller Farm	10/19/2010	< 500
Miller Farm	11/9/2010	< 500
Miller Farm	11/22/2010	< 500
Miller Farm	12/7/2010	< 500
Miller Farm	12/21/2010	< 500
Residence - 1	2/9/2010	< 500

Sample Location	Date of Sample	Tritium Result (pCi/L)
Residence - 1	2/16/2010	< 500
Residence - 1	2/23/2010	< 500
Residence - 1	3/3/2010	< 500
Residence - 1	3/9/2010	< 500
Residence - 1	3/16/2010	< 500
Residence - 1	3/23/2010	< 500
Residence - 1	3/30/2010	< 500
Residence - 1	4/6/2010	< 500
Residence - 1	4/13/2010	< 500
Residence - 1	4/19/2010	< 500
Residence - 1	4/27/2010	< 500
Residence - 1	5/4/2010	< 500
Residence - 1	5/25/2010	< 500
Residence - 1	6/8/2010	< 500
Residence - 1	6/22/2010	< 500
Residence - 1	7/6/2010	< 500
Residence - 1	7/20/2010	< 500
Residence - 1	8/10/2010	< 500
Residence - 1	8/24/2010	< 500
Residence - 1	9/7/2010	< 500
Residence - 1	9/21/2010	< 500
Residence - 1	10/5/2010	< 500
Residence - 1	10/19/2010	< 500
Residence - 1	11/9/2010	< 500
Residence - 1	11/22/2010	< 500
Residence - 1	12/7/2010	< 500
Residence - 1	12/21/2010	< 500
Residence - 2	2/16/2010	< 500
Residence - 2	2/22/2010	< 500
Residence - 2	3/2/2010	< 500
Residence - 2	3/3/2010	< 500

Sample Location	Date of Sample	Tritium Result (pCi/L)
Residence - 2	3/8/2010	< 500
Residence - 2	3/9/2010	< 500
Residence - 2	3/15/2010	< 500
Residence - 2	3/16/2010	< 500
Residence - 2	3/23/2010	< 500
Residence - 2	4/6/2010	< 500
Residence - 2	4/13/2010	< 500
Residence - 2	4/19/2010	< 500
Residence - 2	4/27/2010	< 500
Residence - 2	5/4/2010	< 500
Residence - 2	5/25/2010	< 500
Residence - 2	6/8/2010	< 500
Residence - 2	6/22/2010	< 500
Residence - 2	12/7/2010	< 500
Residence - 2	12/21/2010	< 500
Residence - 3	2/8/2010	< 500
Residence - 3	2/16/2010	< 500
Residence - 3	2/23/2010	< 500
Residence - 3	3/2/2010	< 500
Residence - 3	3/9/2010	< 500
Residence - 3	3/15/2010	< 500
Residence - 3	3/16/2010	< 500
Residence - 3	3/23/2010	< 500
Residence - 3	3/30/2010	< 500
Residence - 3	4/6/2010	< 500
Residence - 3	4/13/2010	< 500
Residence - 3	4/19/2010	< 500
Residence - 3	4/27/2010	< 500
Residence - 3	5/4/2010	< 500
Residence - 3	5/25/2010	< 500
Residence - 3	6/8/2010	< 500

Sample Location	Date of Sample	Tritium Result (pCi/L)
Residence - 3	6/22/2010	< 500
Residence - 3	7/6/2010	< 500
Residence - 3	7/20/2010	< 500
Residence - 3	8/10/2010	< 500
Residence - 3	8/24/2010	< 500
Residence - 3	9/7/2010	< 500
Residence - 3	9/21/2010	< 500
Residence - 3	10/5/2010	< 500
Residence - 3	10/19/2010	< 500
Residence - 3	11/22/2010	< 500
Residence - 3	12/7/2010	< 500
Residence - 3	12/21/2010	< 500
Vernon Elementary School	1/8/2010	< 500
Vernon Elementary School	1/21/2010	< 500
Vernon Elementary School	1/25/2010	< 500
Vernon Elementary School	1/27/2010	< 500
Vernon Elementary School	2/1/2010	< 500
Vernon Elementary School	2/2/2010	< 500
Vernon Elementary School	2/8/2010	< 500
Vernon Elementary School	2/9/2010	< 500
Vernon Elementary School	2/16/2010	< 500
Vernon Elementary School	2/16/2010	< 500
Vernon Elementary School	2/23/2010	< 500
Vernon Elementary School	2/23/2010	< 500
Vernon Elementary School	3/1/2010	< 500
Vernon Elementary School	3/3/2010	< 500
Vernon Elementary School	3/8/2010	< 500
Vernon Elementary School	3/9/2010	< 500
Vernon Elementary School	3/15/2010	< 500
Vernon Elementary School	3/15/2010	< 500
Vernon Elementary School	3/23/2010	< 500

Sample Location	Date of Sample	Tritium Result (pCi/L)
Vernon Elementary School	3/30/2010	< 500
Vernon Elementary School	4/6/2010	< 500
Vernon Elementary School	4/13/2010	< 500
Vernon Elementary School	4/19/2010	< 500
Vernon Elementary School	4/27/2010	< 500
Vernon Elementary School	5/4/2010	< 500
Vernon Elementary School	5/25/2010	< 500
Vernon Elementary School	6/8/2010	< 500
Vernon Elementary School	6/22/2010	< 500
Vernon Elementary School	7/6/2010	< 500
Vernon Elementary School	7/20/2010	< 500
Vernon Elementary School	8/10/2010	< 500
Vernon Elementary School	8/24/2010	< 500
Vernon Elementary School	9/7/2010	< 500
Vernon Elementary School	9/21/2010	< 500
Vernon Elementary School	10/5/2010	< 500
Vernon Elementary School	10/19/2010	< 500
Vernon Elementary School	11/9/2010	< 500
Vernon Elementary School	11/22/2010	< 500
Vernon Elementary School	12/7/2010	< 500
Vernon Elementary School	12/21/2010	< 500
Vernon EOC (Edson House)	2/1/2010	< 500
Vernon EOC (Edson House)	2/8/2010	< 500
Vernon EOC (Edson House)	2/16/2010	< 500
Vernon EOC (Edson House)	2/22/2010	< 500
Vernon EOC (Edson House)	3/15/2010	< 500
Vernon EOC (Edson House)	3/22/2010	< 500
Vernon EOC (Edson House)	4/5/2010	< 500
Vernon EOC (Edson House)	4/12/2010	< 500
Vernon EOC (Edson House)	4/19/2010	< 500
Vernon EOC (Edson House)	4/26/2010	< 500

Sample Location	Date of Sample	Tritium Result (pCi/L)
Vernon EOC (Edson House)	5/3/2010	< 500
Vernon EOC (Edson House)	5/24/2010	< 500
Vernon Green Nursing Home	1/18/2010	< 500
Vernon Green Nursing Home	1/25/2010	< 500
Vernon Green Nursing Home	2/1/2010	< 500
Vernon Green Nursing Home	2/8/2010	< 500
Vernon Green Nursing Home	2/16/2010	< 500
Vernon Green Nursing Home	2/22/2010	< 500
Vernon Green Nursing Home	2/23/2010	< 500
Vernon Green Nursing Home	3/1/2010	< 500
Vernon Green Nursing Home	3/3/2010	< 500
Vernon Green Nursing Home	3/8/2010	< 500
Vernon Green Nursing Home	3/9/2010	< 500
Vernon Green Nursing Home	3/15/2010	< 500
Vernon Green Nursing Home	3/16/2010	< 500
Vernon Green Nursing Home	3/23/2010	< 500
Vernon Green Nursing Home	3/30/2010	< 500
Vernon Green Nursing Home	4/6/2010	< 500
Vernon Green Nursing Home	4/13/2010	< 500
Vernon Green Nursing Home	4/19/2010	< 500
Vernon Green Nursing Home	4/27/2010	< 500
Vernon Green Nursing Home	5/4/2010	< 500
Vernon Green Nursing Home	5/25/2010	< 500
Vernon Green Nursing Home	6/8/2010	< 500
Vernon Green Nursing Home	6/22/2010	< 500
Vernon Green Nursing Home	7/6/2010	< 500
Vernon Green Nursing Home	7/20/2010	< 500
Vernon Green Nursing Home	8/10/2010	< 500
Vernon Green Nursing Home	8/24/2010	< 500
Vernon Green Nursing Home	9/7/2010	< 500
Vernon Green Nursing Home	9/21/2010	< 500

Sample Location	Date of Sample	Tritium Result (pCi/L)
Vernon Green Nursing Home	10/5/2010	< 500
Vernon Green Nursing Home	10/19/2010	< 500
Vernon Green Nursing Home	11/9/2010	< 500
Vernon Green Nursing Home	11/22/2010	< 500
Vernon Green Nursing Home	12/7/2010	< 500
Vernon Green Nursing Home	12/21/2010	< 500
COB Well (total well)	1/18/2010	< 500
COB Well (total well)	1/25/2010	< 500
COB Well (total well)	2/3/2010	< 500
COB Well (total well)	2/8/2010	< 500
COB Well (total well)	2/16/2010	< 500
COB Well (packer testing, 200-220 feet)	10/2/2010	1050 +/- 210
COB Well (packer testing, 300-320 feet)	9/23/2010	< 500
Main Well	1/18/2010	< 500
Main Well	1/25/2010	< 500
Main Well	2/1/2010	< 500
Main Well	2/8/2010	< 500
Main Well	2/16/2010	< 500
Main Well	2/24/2010	< 500
Main Well	3/1/2010	< 500
Main Well	3/8/2010	< 500
Main Well	3/22/2010	< 500
Main Well	3/30/2010	< 500
Main Well	4/5/2010	< 500
Main Well	4/12/2010	< 500
Main Well	4/19/2010	< 500
Main Well	4/26/2010	< 500
Main Well	5/3/2010	< 500
Main Well	5/24/2010	< 500
Main Well	8/4/2010	< 500
Main Well	8/24/2010	< 500

Sample Location	Date of Sample	Tritium Result (pCi/L)
Main Well	9/7/2010	< 500
Main Well	9/21/2010	< 500
Main Well	10/7/2010	< 500
Main Well	11/3/2010	< 500
Main Well	12/7/2010	< 500
PSB Well	1/18/2010	< 500
PSB Well	1/25/2010	< 500
PSB Well	2/1/2010	< 500
PSB Well	2/8/2010	< 500
PSB Well	2/17/2010	< 500
PSB Well	2/24/2010	< 500
PSB Well	3/1/2010	< 500
PSB Well	3/8/2010	< 500
PSB Well	3/22/2010	< 500
PSB Well	3/30/2010	< 500
PSB Well	4/5/2010	< 500
PSB Well	4/12/2010	< 500
PSB Well	4/19/2010	< 500
PSB Well	4/26/2010	< 500
PSB Well	5/3/2010	< 500
PSB Well	5/24/2010	< 500
PSB Well	10/8/2010	< 500
PSB Well	11/3/2010	< 500
PSB Well	12/7/2010	< 500
VY Garage	2/1/2010	< 500
VY Garage	2/8/2010	< 500
VY Garage	2/16/2010	< 500
VY Garage	2/22/2010	< 500
VY Garage	3/1/2010	< 500
VY Garage	3/8/2010	< 500
VY Garage	3/15/2010	< 500

Sample Location	Date of Sample	Tritium Result (pCi/L)
VY Garage	3/22/2010	< 500
VY Garage	3/30/2010	< 500
VY Garage	4/5/2010	< 500
VY Garage	4/12/2010	< 500
VY Garage	4/19/2010	< 500
VY Garage	4/26/2010	< 500
VY Garage	5/3/2010	< 500
VY Garage	5/24/2010	< 500
White House	2/1/2010	< 500
White House	2/8/2010	< 500
White House	2/16/2010	< 500
White House	2/23/2010	< 500
White House	3/1/2010	< 500
White House	3/8/2010	< 500
White House	3/15/2010	< 500
White House	3/22/2010	< 500
White House	3/30/2010	< 500
White House	4/5/2010	< 500
White House	4/12/2010	< 500
White House	4/19/2010	< 500
White House	4/26/2010	< 500
White House	5/3/2010	< 500
White House	5/24/2010	< 500
White House	12/7/2010	< 500

Appendix B

2010 Gamma Spectroscopy Water Data

Gamma spectroscopy results for all water samples tested by the Health Department in 2010 are provided in this appendix. Results are presented in alphabetical order by sample location and by sampling date based on the following categories:

- Connecticut River samples
- On-site groundwater monitoring wells
- Off-site drinking water wells
- On-site drinking water wells[2]

Natural means that gamma-emitting materials detected are not related to nuclear power stations or above-grounds weapons testing.

< LLD means less than the Laboratory's Lower Limit if Detection.

[2] Note: the COB well was off-line as a drinking water well as of February 25, 2010.

Sample Location	Date of Sample	Gamma Spectrometry Result
3-3 Connecticut River Station	1/13/2010	< LLD
3-3 Connecticut River Station	2/15/2010	< LLD
3-3 Connecticut River Station	3/13/2010	< LLD
3-3 Connecticut River Station	4/14/2010	Natural
3-3 Connecticut River Station	5/13/2010	< LLD
3-3 Connecticut River Station	6/15/2010	< LLD
3-3 Connecticut River Station	7/14/2010	< LLD
3-3 Connecticut River Station	8/17/2010	< LLD
3-3 Connecticut River Station	9/15/2010	< LLD
3-3 Connecticut River Station	10/14/2010	< LLD
3-3 Connecticut River Station	11/16/2010	< LLD
3-3 Connecticut River Station	12/16/2010	< LLD
3-4 Connecticut River Station	1/13/2010	< LLD
3-4 Connecticut River Station	2/15/2010	< LLD
3-4 Connecticut River Station	3/13/2010	< LLD
3-4 Connecticut River Station	4/14/2010	< LLD
3-4 Connecticut River Station	5/13/2010	< LLD
3-4 Connecticut River Station	6/15/2010	< LLD
3-4 Connecticut River Station	7/14/2010	< LLD
3-4 Connecticut River Station	8/17/2010	< LLD
3-4 Connecticut River Station	9/15/2010	< LLD
3-4 Connecticut River Station	10/14/2010	< LLD
3-4 Connecticut River Station	11/16/2010	< LLD
3-4 Connecticut River Station	12/16/2010	< LLD
3-8 Connecticut River Station	1/13/2010	< LLD
3-8 Connecticut River Station	2/15/2010	< LLD
3-8 Connecticut River Station	3/13/2010	< LLD
3-8 Connecticut River Station	4/14/2010	< LLD
3-8 Connecticut River Station	5/13/2010	< LLD
3-8 Connecticut River Station	6/15/2010	< LLD
3-8 Connecticut River Station	7/14/2010	Natural

Sample Location	Date of Sample	Gamma Spectrometry Result
3-8 Connecticut River Station	8/17/2010	< LLD
3-8 Connecticut River Station	9/15/2010	< LLD
3-8 Connecticut River Station	10/14/2010	< LLD
3-8 Connecticut River Station	11/16/2010	< LLD
3-8 Connecticut River Station	12/16/2010	< LLD
Connecticut River Downstream	1/8/2010	< LLD
Connecticut River Downstream	1/21/2010	< LLD
Connecticut River Downstream	1/25/2010	< LLD
Connecticut River Downstream	1/27/2010	< LLD
Connecticut River Downstream	2/1/2010	< LLD
Connecticut River Downstream	2/2/2010	< LLD
Connecticut River Downstream	2/8/2010	< LLD
Connecticut River Downstream	2/9/2010	< LLD
Connecticut River Downstream	2/16/2010	< LLD
Connecticut River Downstream	2/22/2010	Natural
Connecticut River Downstream	2/23/2010	< LLD
Connecticut River Downstream	3/3/2010	< LLD
Connecticut River Downstream	3/9/2010	< LLD
Connecticut River Downstream	3/15/2010	< LLD
Connecticut River Downstream	3/15/2010	< LLD
Connecticut River Downstream	3/22/2010	< LLD
Connecticut River Downstream	3/23/2010	< LLD
Connecticut River Downstream	4/5/2010	< LLD
Connecticut River Downstream	4/6/2010	< LLD
Connecticut River Downstream	4/19/2010	< LLD
Connecticut River Downstream	5/4/2010	< LLD
Connecticut River Downstream	5/25/2010	< LLD
Connecticut River Downstream	6/8/2010	< LLD
Connecticut River Downstream	6/22/2010	< LLD
Connecticut River Downstream	7/6/2010	< LLD
Connecticut River Downstream	7/20/2010	< LLD
Connecticut River Downstream	8/10/2010	< LLD
Connecticut River Downstream	8/24/2010	< LLD

Sample Location	Date of Sample	Gamma Spectrometry Result
Connecticut River Downstream	9/7/2010	< LLD
Connecticut River Downstream	9/21/2010	< LLD
Connecticut River Downstream	10/5/2010	< LLD
Connecticut River Downstream	10/19/2010	< LLD
Connecticut River Downstream	11/9/2010	< LLD
Connecticut River Downstream	11/22/2010	< LLD
Connecticut River Downstream	12/7/2010	< LLD
Connecticut River Downstream	12/21/2010	< LLD
Connecticut River Upstream	1/21/2010	< LLD
Connecticut River Upstream	1/27/2010	< LLD
Connecticut River Upstream	2/9/2010	< LLD
Connecticut River Upstream	2/23/2010	< LLD
Connecticut River Upstream	3/9/2010	< LLD
Connecticut River Upstream	3/15/2010	< LLD
Connecticut River Upstream	3/23/2010	< LLD
Connecticut River Upstream	4/6/2010	< LLD
Connecticut River Upstream	4/19/2010	< LLD
Connecticut River Upstream	5/4/2010	< LLD
Connecticut River Upstream	5/25/2010	< LLD
Connecticut River Upstream	6/8/2010	< LLD
Connecticut River Upstream	6/22/2010	< LLD
Connecticut River Upstream	7/6/2010	< LLD
Connecticut River Upstream	7/20/2010	< LLD
Connecticut River Upstream	8/10/2010	< LLD
Connecticut River Upstream	8/24/2010	< LLD
Connecticut River Upstream	9/7/2010	< LLD
Connecticut River Upstream	9/21/2010	< LLD
Connecticut River Upstream	10/5/2010	< LLD
Connecticut River Upstream	10/19/2010	< LLD
Connecticut River Upstream	11/9/2010	Natural
Connecticut River Upstream	11/22/2010	Natural
Connecticut River Upstream	12/7/2010	< LLD
Connecticut River Upstream	12/21/2010	Natural

Sample Location	Date of Sample	Gamma Spectrometry Result
Discharge Forebay	1/13/2010	< LLD
Discharge Forebay	2/15/2010	< LLD
Discharge Forebay	3/13/2010	< LLD
Discharge Forebay	4/14/2010	< LLD
Discharge Forebay	5/13/2010	< LLD
Discharge Forebay	6/15/2010	< LLD
Discharge Forebay	7/14/2010	< LLD
Discharge Forebay	8/17/2010	< LLD
Discharge Forebay	9/15/2010	< LLD
Discharge Forebay	10/14/2010	< LLD
Discharge Forebay	11/16/2010	< LLD
Discharge Forebay	12/16/2010	< LLD
Upstream of the VY River Discharge	1/11/2010	< LLD
Upstream of the VY River Discharge	1/18/2010	< LLD
Upstream of the VY River Discharge	1/25/2010	< LLD
Upstream of the VY River Discharge	2/1/2010	Natural
Upstream of the VY River Discharge	2/8/2010	< LLD
Upstream of the VY River Discharge	2/13/2010	< LLD
Upstream of the VY River Discharge	2/14/2010	< LLD
Upstream of the VY River Discharge	2/16/2010	< LLD
Upstream of the VY River Discharge	2/17/2010	< LLD
Upstream of the VY River Discharge	2/18/2010	< LLD
Upstream of the VY River Discharge	2/19/2010	< LLD
Upstream of the VY River Discharge	2/28/2010	< LLD
Upstream of the VY River Discharge	3/1/2010	< LLD
Upstream of the VY River Discharge	3/2/2010	< LLD
Upstream of the VY River Discharge	3/3/2010	< LLD
Upstream of the VY River Discharge	3/5/2010	< LLD
Upstream of the VY River Discharge	3/15/2010	Natural
Upstream of the VY River Discharge	3/22/2010	< LLD
Upstream of the VY River Discharge	3/29/2010	< LLD
Upstream of the VY River Discharge	4/12/2010	< LLD
Upstream of the VY River Discharge	4/26/2010	< LLD

Sample Location	Date of Sample	Gamma Spectrometry Result
Upstream of the VY River Discharge	5/10/2010	< LLD
Upstream of the VY River Discharge	5/24/2010	< LLD
Upstream of the VY River Discharge	6/7/2010	< LLD
Upstream of the VY River Discharge	6/21/2010	< LLD
Upstream of the VY River Discharge	7/6/2010	< LLD
Upstream of the VY River Discharge	7/19/2010	< LLD
Upstream of the VY River Discharge	8/2/2010	< LLD
Upstream of the VY River Discharge	8/19/2010	< LLD
Upstream of the VY River Discharge	9/13/2010	< LLD
Upstream of the VY River Discharge	9/29/2010	< LLD
Upstream of the VY River Discharge	10/12/2010	< LLD
Upstream of the VY River Discharge	10/18/2010	< LLD
Upstream of the VY River Discharge	10/25/2010	< LLD
Upstream of the VY River Discharge	11/1/2010	< LLD
Upstream of the VY River Discharge	11/8/2010	< LLD
Upstream of the VY River Discharge	12/6/2010	< LLD
GZ-01	1/7/2010	Natural
GZ-01	1/11/2010	Natural
GZ-01	1/14/2010	Natural
GZ-01	1/18/2010	< LLD
GZ-01	1/25/2010	< LLD
GZ-01	2/1/2010	Natural
GZ-01	2/8/2010	Natural
GZ-01	2/16/2010	Natural
GZ-01	3/22/2010	< LLD
GZ-01	6/2/2010	< LLD
GZ-01	8/2/2010	< LLD
GZ-01	10/4/2010	< LLD
GZ-01	11/1/2010	< LLD
GZ-02	2/8/2010	Natural
GZ-02	2/16/2010	Natural
GZ-02	3/26/2010	Natural
GZ-02	5/3/2010	< LLD

Sample Location	Date of Sample	Gamma Spectrometry Result
GZ-02	6/2/2010	< LLD
GZ-02	6/28/2010	< LLD
GZ-02	8/2/2010	< LLD
GZ-02	9/7/2010	< LLD
GZ-02	10/4/2010	< LLD
GZ-02	11/1/2010	< LLD
GZ-02	12/6/2010	Natural
GZ-03	1/7/2010	Natural
GZ-03	1/11/2010	Natural
GZ-03	1/25/2010	Natural
GZ-03	2/1/2010	Natural
GZ-03	2/8/2010	< LLD
GZ-03	2/16/2010	< LLD
GZ-03	2/22/2010	< LLD
GZ-03	3/1/2010	< LLD
GZ-03	3/8/2010	< LLD
GZ-03	3/15/2010	< LLD
GZ-03	3/22/2010	< LLD
GZ-03	3/29/2010	< LLD
GZ-03	4/5/2010	< LLD
GZ-03	4/12/2010	< LLD
GZ-03	4/19/2010	< LLD
GZ-03	4/26/2010	< LLD
GZ-03	5/3/2010	< LLD
GZ-03	5/10/2010	< LLD
GZ-03	5/17/2010	< LLD
GZ-03	5/24/2010	< LLD
GZ-03	6/1/2010	< LLD
GZ-03	6/7/2010	< LLD
GZ-03	6/14/2010	< LLD
GZ-03	6/21/2010	< LLD
GZ-03	6/28/2010	< LLD
GZ-03	7/6/2010	< LLD

Sample Location	Date of Sample	Gamma Spectrometry Result
GZ-03	7/12/2010	< LLD
GZ-03	7/19/2010	< LLD
GZ-03	7/26/2010	< LLD
GZ-03	8/2/2010	< LLD
GZ-03	8/19/2010	< LLD
GZ-03	9/7/2010	< LLD
GZ-03	10/4/2010	< LLD
GZ-03	11/1/2010	< LLD
GZ-03	12/6/2010	< LLD
GZ-04	2/1/2010	Natural
GZ-04	2/8/2010	< LLD
GZ-04	2/16/2010	< LLD
GZ-04	2/22/2010	< LLD
GZ-04	3/1/2010	< LLD
GZ-04	3/8/2010	< LLD
GZ-04	3/15/2010	< LLD
GZ-04	3/22/2010	< LLD
GZ-04	3/29/2010	< LLD
GZ-04	4/5/2010	< LLD
GZ-04	4/12/2010	< LLD
GZ-04	4/19/2010	< LLD
GZ-04	4/26/2010	< LLD
GZ-04	5/3/2010	< LLD
GZ-04	5/10/2010	< LLD
GZ-04	5/17/2010	< LLD
GZ-04	5/24/2010	< LLD
GZ-04	6/1/2010	< LLD
GZ-04	6/7/2010	< LLD
GZ-04	6/14/2010	< LLD
GZ-04	6/21/2010	< LLD
GZ-04	6/28/2010	< LLD
GZ-04	7/6/2010	< LLD
GZ-04	7/12/2010	< LLD

Sample Location	Date of Sample	Gamma Spectrometry Result
GZ-04	7/19/2010	< LLD
GZ-04	7/26/2010	< LLD
GZ-04	8/2/2010	< LLD
GZ-04	8/19/2010	< LLD
GZ-04	9/7/2010	< LLD
GZ-04	10/4/2010	< LLD
GZ-04	11/1/2010	< LLD
GZ-04	12/6/2010	< LLD
GZ-05	1/7/2010	Natural
GZ-05	1/11/2010	Natural
GZ-05	1/14/2010	< LLD
GZ-05	1/18/2010	< LLD
GZ-05	1/25/2010	Natural
GZ-05	2/1/2010	< LLD
GZ-05	2/8/2010	< LLD
GZ-05	2/16/2010	< LLD
GZ-05	3/1/2010	< LLD
GZ-05	3/15/2010	< LLD
GZ-05	3/29/2010	< LLD
GZ-05	4/12/2010	< LLD
GZ-05	4/26/2010	< LLD
GZ-05	5/10/2010	< LLD
GZ-05	5/24/2010	< LLD
GZ-05	6/7/2010	< LLD
GZ-05	6/21/2010	< LLD
GZ-05	6/28/2010	< LLD
GZ-05	8/2/2010	< LLD
GZ-05	9/7/2010	< LLD
GZ-05	10/4/2010	< LLD
GZ-05	11/1/2010	< LLD
GZ-05	12/6/2010	< LLD
GZ-06	2/1/2010	Natural
GZ-06	2/8/2010	Natural

Sample Location	Date of Sample	Gamma Spectrometry Result
GZ-06	2/16/2010	Natural
GZ-06	3/1/2010	Natural
GZ-06	3/15/2010	< LLD
GZ-06	3/29/2010	< LLD
GZ-06	4/12/2010	< LLD
GZ-06	4/26/2010	< LLD
GZ-06	5/10/2010	Natural
GZ-06	7/19/2010	< LLD
GZ-06	8/2/2010	Natural
GZ-06	10/4/2010	< LLD
GZ-06	11/2/2010	< LLD
GZ-06	12/6/2010	< LLD
GZ-07	2/8/2010	< LLD
GZ-07	4/19/2010	< LLD
GZ-07	4/26/2010	< LLD
GZ-07	5/3/2010	< LLD
GZ-07	5/10/2010	< LLD
GZ-07	5/17/2010	< LLD
GZ-07	5/24/2010	< LLD
GZ-07	6/1/2010	< LLD
GZ-07	6/7/2010	< LLD
GZ-07	6/21/2010	< LLD
GZ-07	6/28/2010	< LLD
GZ-07	7/6/2010	< LLD
GZ-07	7/12/2010	< LLD
GZ-07	7/19/2010	< LLD
GZ-07	8/2/2010	< LLD
GZ-07	8/19/2010	< LLD
GZ-07	9/7/2010	< LLD
GZ-07	10/4/2010	< LLD
GZ-07	11/1/2010	< LLD
GZ-07	12/6/2010	< LLD
GZ-09	2/8/2010	Natural

Sample Location	Date of Sample	Gamma Spectrometry Result
GZ-09	2/16/2010	< LLD
GZ-09	3/1/2010	< LLD
GZ-09	3/15/2010	< LLD
GZ-09	4/12/2010	< LLD
GZ-09	4/26/2010	< LLD
GZ-09	5/10/2010	< LLD
GZ-09	5/24/2010	< LLD
GZ-09	6/21/2010	< LLD
GZ-09	6/28/2010	< LLD
GZ-09	8/2/2010	< LLD
GZ-09	9/7/2010	< LLD
GZ-09	10/4/2010	< LLD
GZ-09	11/1/2010	< LLD
GZ-09	12/6/2010	< LLD
GZ-10	2/8/2010	< LLD
GZ-10	3/15/2010	< LLD
GZ-10	3/22/2010	< LLD
GZ-10	3/29/2010	< LLD
GZ-10	4/5/2010	< LLD
GZ-10	4/12/2010	< LLD
GZ-10	4/26/2010	< LLD
GZ-10	5/3/2010	< LLD
GZ-10	5/10/2010	< LLD
GZ-10	5/24/2010	< LLD
GZ-10	6/7/2010	< LLD
GZ-10	6/21/2010	< LLD
GZ-10	7/6/2010	< LLD
GZ-10	7/19/2010	< LLD
GZ-10	8/2/2010	< LLD
GZ-10	8/19/2010	< LLD
GZ-10	9/7/2010	< LLD
GZ-10	10/4/2010	< LLD
GZ-10	11/2/2010	< LLD

Sample Location	Date of Sample	Gamma Spectrometry Result
GZ-10	12/6/2010	< LLD
GZ-11	2/8/2010	< LLD
GZ-11	2/16/2010	Natural
GZ-11	3/1/2010	< LLD
GZ-11	3/15/2010	< LLD
GZ-11	3/29/2010	Natural
GZ-11	4/12/2010	< LLD
GZ-11	4/19/2010	< LLD
GZ-11	4/26/2010	< LLD
GZ-11	5/3/2010	< LLD
GZ-11	5/10/2010	< LLD
GZ-11	5/17/2010	< LLD
GZ-11	5/24/2010	< LLD
GZ-11	6/1/2010	< LLD
GZ-11	6/7/2010	< LLD
GZ-11	6/14/2010	< LLD
GZ-11	6/21/2010	< LLD
GZ-11	6/28/2010	< LLD
GZ-11	7/6/2010	< LLD
GZ-11	7/12/2010	< LLD
GZ-11	7/19/2010	< LLD
GZ-11	7/26/2010	< LLD
GZ-11	8/2/2010	< LLD
GZ-11	9/7/2010	< LLD
GZ-11	10/4/2010	< LLD
GZ-11	11/1/2010	< LLD
GZ-11	12/6/2010	< LLD
GZ-12S	2/8/2010	Natural
GZ-12S	2/16/2010	< LLD
GZ-12S	2/22/2010	< LLD
GZ-12S	3/1/2010	< LLD
GZ-12S	3/8/2010	< LLD
GZ-12S	3/15/2010	< LLD

Sample Location	Date of Sample	Gamma Spectrometry Result
GZ-12S	3/22/2010	< LLD
GZ-12S	3/29/2010	< LLD
GZ-12S	4/5/2010	< LLD
GZ-12S	5/10/2010	< LLD
GZ-12S	5/17/2010	< LLD
GZ-12S	5/24/2010	< LLD
GZ-12S	6/1/2010	< LLD
GZ-12S	6/7/2010	< LLD
GZ-12S	6/14/2010	< LLD
GZ-12S	6/21/2010	< LLD
GZ-12S	6/28/2010	< LLD
GZ-12S	7/6/2010	< LLD
GZ-12S	7/12/2010	< LLD
GZ-12S	7/19/2010	< LLD
GZ-12S	7/26/2010	< LLD
GZ-12S	8/2/2010	< LLD
GZ-12S	8/19/2010	< LLD
GZ-12S	9/7/2010	< LLD
GZ-12S	10/4/2010	< LLD
GZ-12S	11/1/2010	< LLD
GZ-12S	12/6/2010	< LLD
GZ-12D	12/6/2010	< LLD
GZ-13S	2/8/2010	< LLD
GZ-13S	2/16/2010	< LLD
GZ-13S	3/1/2010	< LLD
GZ-13S	3/15/2010	< LLD
GZ-13S	3/29/2010	< LLD
GZ-13S	4/5/2010	< LLD
GZ-13S	4/12/2010	< LLD
GZ-13S	4/19/2010	< LLD
GZ-13S	4/26/2010	< LLD
GZ-13S	5/3/2010	< LLD
GZ-13S	5/10/2010	< LLD

Sample Location	Date of Sample	Gamma Spectrometry Result
GZ-13S	5/24/2010	< LLD
GZ-13S	6/7/2010	< LLD
GZ-13S	6/21/2010	< LLD
GZ-13S	6/28/2010	< LLD
GZ-13S	7/6/2010	< LLD
GZ-13S	7/19/2010	< LLD
GZ-13S	8/2/2010	< LLD
GZ-13S	8/19/2010	< LLD
GZ-13S	9/7/2010	< LLD
GZ-13S	10/4/2010	< LLD
GZ-13S	11/1/2010	< LLD
GZ-13S	12/6/2010	< LLD
GZ-13D	3/15/2010	< LLD
GZ-13D	3/29/2010	< LLD
GZ-13D	4/5/2010	< LLD
GZ-13D	4/12/2010	< LLD
GZ-13D	4/19/2010	< LLD
GZ-13D	4/26/2010	< LLD
GZ-13D	5/3/2010	< LLD
GZ-13D	5/10/2010	< LLD
GZ-13D	5/17/2010	< LLD
GZ-13D	5/24/2010	< LLD
GZ-13D	6/1/2010	< LLD
GZ-13D	6/7/2010	< LLD
GZ-13D	6/14/2010	< LLD
GZ-13D	6/21/2010	< LLD
GZ-13D	6/28/2010	< LLD
GZ-13D	7/6/2010	< LLD
GZ-13D	7/12/2010	< LLD
GZ-13D	7/19/2010	< LLD
GZ-13D	7/26/2010	< LLD
GZ-13D	8/2/2010	< LLD
GZ-13D	8/19/2010	< LLD

Sample Location	Date of Sample	Gamma Spectrometry Result
GZ-13D	9/7/2010	< LLD
GZ-13D	10/4/2010	< LLD
GZ-13D	11/1/2010	< LLD
GZ-13D	12/6/2010	< LLD
GZ-14S	2/1/2010	Natural
GZ-14S	2/8/2010	Natural
GZ-14S	2/16/2010	< LLD
GZ-14S	2/22/2010	< LLD
GZ-14S	3/1/2010	< LLD
GZ-14S	3/8/2010	Natural
GZ-14S	3/15/2010	< LLD
GZ-14S	3/22/2010	< LLD
GZ-14S	3/29/2010	< LLD
GZ-14S	4/5/2010	< LLD
GZ-14S	4/12/2010	< LLD
GZ-14S	5/10/2010	< LLD
GZ-14S	5/17/2010	< LLD
GZ-14S	5/24/2010	< LLD
GZ-14S	6/1/2010	< LLD
GZ-14S	6/7/2010	< LLD
GZ-14S	6/21/2010	< LLD
GZ-14S	6/28/2010	< LLD
GZ-14S	7/6/2010	< LLD
GZ-14S	7/12/2010	< LLD
GZ-14S	7/19/2010	< LLD
GZ-14S	7/26/2010	< LLD
GZ-14S	8/2/2010	< LLD
GZ-14S	8/19/2010	< LLD
GZ-14S	9/7/2010	< LLD
GZ-14S	10/4/2010	< LLD
GZ-14S	11/1/2010	< LLD
GZ-14S	12/6/2010	< LLD
GZ-14D	3/15/2010	< LLD

Sample Location	Date of Sample	Gamma Spectrometry Result
GZ-14D	3/22/2010	< LLD
GZ-14D	3/29/2010	< LLD
GZ-14D	4/5/2010	< LLD
GZ-14D	4/12/2010	< LLD
GZ-14D	4/19/2010	< LLD
GZ-14D	4/26/2010	< LLD
GZ-14D	5/3/2010	< LLD
GZ-14D	5/10/2010	< LLD
GZ-14D	5/24/2010	< LLD
GZ-14D	6/7/2010	< LLD
GZ-14D	6/21/2010	< LLD
GZ-14D	6/28/2010	< LLD
GZ-14D	7/6/2010	< LLD
GZ-14D	7/19/2010	< LLD
GZ-14D	8/2/2010	< LLD
GZ-14D	8/19/2010	Natural
GZ-14D	9/7/2010	< LLD
GZ-14D	10/4/2010	< LLD
GZ-14D	11/1/2010	< LLD
GZ-14D	12/6/2010	< LLD
GZ-15	2/16/2010	< LLD
GZ-15	5/10/2010	< LLD
GZ-15	5/17/2010	< LLD
GZ-15	5/24/2010	< LLD
GZ-15	6/1/2010	< LLD
GZ-15	6/7/2010	< LLD
GZ-15	6/14/2010	< LLD
GZ-15	6/21/2010	< LLD
GZ-15	7/6/2010	< LLD
GZ-15	7/12/2010	< LLD
GZ-15	7/19/2010	< LLD
GZ-15	7/26/2010	< LLD
GZ-15	8/19/2010	< LLD

Sample Location	Date of Sample	Gamma Spectrometry Result
GZ-15	9/7/2010	< LLD
GZ-15	10/4/2010	< LLD
GZ-15	11/1/2010	< LLD
GZ-15	12/6/2010	< LLD
GZ-16	3/15/2010	< LLD
GZ-16	3/29/2010	< LLD
GZ-16	4/12/2010	< LLD
GZ-16	4/26/2010	< LLD
GZ-16	5/10/2010	< LLD
GZ-16	5/24/2010	< LLD
GZ-16	6/7/2010	< LLD
GZ-16	6/21/2010	< LLD
GZ-16	7/6/2010	< LLD
GZ-16	7/19/2010	< LLD
GZ-16	8/2/2010	< LLD
GZ-16	8/19/2010	< LLD
GZ-16	10/4/2010	< LLD
GZ-16	11/1/2010	< LLD
GZ-16	12/6/2010	< LLD
GZ-17	3/1/2010	< LLD
GZ-17	3/15/2010	< LLD
GZ-17	3/29/2010	< LLD
GZ-17	4/12/2010	< LLD
GZ-17	4/26/2010	< LLD
GZ-17	5/10/2010	< LLD
GZ-17	5/24/2010	< LLD
GZ-17	6/7/2010	< LLD
GZ-17	6/21/2010	< LLD
GZ-17	6/28/2010	< LLD
GZ-17	8/2/2010	< LLD
GZ-17	9/7/2010	< LLD
GZ-17	10/4/2010	< LLD
GZ-17	11/2/2010	< LLD

Sample Location	Date of Sample	Gamma Spectrometry Result
GZ-17	12/6/2010	< LLD
GZ-18S	10/4/2010	< LLD
GZ-18S	11/1/2010	< LLD
GZ-18S	12/6/2010	< LLD
GZ-18D	11/1/2010	< LLD
GZ-18D	12/6/2010	< LLD
GZ-19S	3/1/2010	< LLD
GZ-19S	3/15/2010	< LLD
GZ-19S	3/29/2010	< LLD
GZ-19S	4/12/2010	Natural
GZ-19S	4/26/2010	< LLD
GZ-19S	5/10/2010	Natural
GZ-19S	5/24/2010	< LLD
GZ-19S	6/7/2010	< LLD
GZ-19S	6/21/2010	< LLD
GZ-19S	6/28/2010	< LLD
GZ-19S	8/2/2010	< LLD
GZ-19S	9/7/2010	< LLD
GZ-19S	10/4/2010	< LLD
GZ-19S	11/1/2010	< LLD
GZ-19D	3/15/2010	Natural
GZ-19D	3/29/2010	< LLD
GZ-19D	4/12/2010	< LLD
GZ-19D	4/26/2010	Natural
GZ-19D	5/10/2010	Natural
GZ-19D	5/24/2010	< LLD
GZ-19D	6/7/2010	< LLD
GZ-19D	6/21/2010	Natural
GZ-19D	6/28/2010	< LLD
GZ-19D	8/2/2010	< LLD
GZ-19D	9/7/2010	< LLD
GZ-19D	10/4/2010	< LLD
GZ-19D	11/1/2010	< LLD

Sample Location	Date of Sample	Gamma Spectrometry Result
GZ-20	3/15/2010	< LLD
GZ-20	3/29/2010	< LLD
GZ-20	4/5/2010	< LLD
GZ-20	4/12/2010	< LLD
GZ-20	4/19/2010	< LLD
GZ-20	4/26/2010	< LLD
GZ-20	5/3/2010	Natural
GZ-20	5/10/2010	< LLD
GZ-20	5/17/2010	< LLD
GZ-20	5/24/2010	< LLD
GZ-20	6/1/2010	< LLD
GZ-20	6/7/2010	< LLD
GZ-20	6/14/2010	< LLD
GZ-20	6/21/2010	< LLD
GZ-20	6/28/2010	< LLD
GZ-20	7/6/2010	< LLD
GZ-20	7/12/2010	< LLD
GZ-20	7/19/2010	< LLD
GZ-20	7/26/2010	< LLD
GZ-20	8/2/2010	< LLD
GZ-20	8/19/2010	< LLD
GZ-20	9/7/2010	< LLD
GZ-20	10/4/2010	< LLD
GZ-20	11/1/2010	< LLD
GZ-20	12/6/2010	< LLD
GZ-21	3/15/2010	< LLD
GZ-21	5/10/2010	< LLD
GZ-21	5/17/2010	< LLD
GZ-21	5/24/2010	Natural
GZ-21	6/1/2010	< LLD
GZ-21	6/7/2010	< LLD
GZ-21	6/14/2010	< LLD
GZ-21	6/21/2010	< LLD

Sample Location	Date of Sample	Gamma Spectrometry Result
GZ-21	6/28/2010	< LLD
GZ-21	7/6/2010	< LLD
GZ-21	7/12/2010	< LLD
GZ-21	7/19/2010	< LLD
GZ-21	7/26/2010	< LLD
GZ-21	8/2/2010	< LLD
GZ-21	8/19/2010	< LLD
GZ-21	9/7/2010	< LLD
GZ-21	10/4/2010	< LLD
GZ-21	11/1/2010	< LLD
GZ-21	12/6/2010	< LLD
GZ-22D	12/6/2010	Natural
GZ-23S	12/6/2010	< LLD
GZ-24S	12/6/2010	Natural
GZ-25S	12/6/2010	< LLD
GZ-26S	12/6/2010	< LLD
GZ-27S	12/6/2010	< LLD
WVN0201	3/22/2010	< LLD
WVN0201	6/2/2010	< LLD
WVN0201	8/3/2010	< LLD
WVN0201	11/4/2010	< LLD
WVN0202	3/22/2010	< LLD
WVN0202	6/2/2010	< LLD
WVN0202	8/3/2010	< LLD
WVN0202	11/4/2010	< LLD
WVN0203	3/22/2010	< LLD
WVN0203	6/2/2010	< LLD
WVN0203	8/3/2010	< LLD
WVN0203	11/4/2010	< LLD
WVN0204	3/22/2010	Natural
WVN0204	6/2/2010	Natural
WVN0204	8/3/2010	Natural
WVN0204	11/3/2010	< LLD

Sample Location	Date of Sample	Gamma Spectrometry Result
Blodgett Farm	1/8/2010	Natural
Blodgett Farm	1/21/2010	Natural
Blodgett Farm	1/27/2010	Natural
Blodgett Farm	2/2/2010	Natural
Blodgett Farm	2/9/2010	Natural
Blodgett Farm	2/23/2010	Natural
Blodgett Farm	3/9/2010	Natural
Blodgett Farm	3/15/2010	Natural
Blodgett Farm	3/23/2010	Natural
Blodgett Farm	4/6/2010	Natural
Blodgett Farm	4/19/2010	Natural
Blodgett Farm	5/4/2010	Natural
Blodgett Farm	5/25/2010	Natural
Blodgett Farm	6/8/2010	Natural
Blodgett Farm	6/22/2010	Natural
Blodgett Farm	7/6/2010	Natural
Blodgett Farm	7/20/2010	Natural
Blodgett Farm	8/10/2010	Natural
Blodgett Farm	8/24/2010	Natural
Blodgett Farm	9/7/2010	Natural
Blodgett Farm	9/21/2010	Natural
Blodgett Farm	10/5/2010	Natural
Blodgett Farm	10/19/2010	Natural
Blodgett Farm	11/9/2010	Natural
Blodgett Farm	11/22/2010	Natural
Blodgett Farm	12/7/2010	Natural
Blodgett Farm	12/21/2010	Natural
Brattleboro Fire Dept, West Station	1/8/2010	< LLD
Brattleboro Fire Dept, West Station	1/21/2010	< LLD
Brattleboro Fire Dept, West Station	1/27/2010	< LLD
Brattleboro Fire Dept, West Station	2/2/2010	< LLD
Brattleboro Fire Dept, West Station	2/9/2010	Natural
Brattleboro Fire Dept, West Station	2/23/2010	< LLD

Sample Location	Date of Sample	Gamma Spectrometry Result
Brattleboro Fire Dept, West Station	3/9/2010	< LLD
Brattleboro Fire Dept, West Station	3/15/2010	< LLD
Brattleboro Fire Dept, West Station	3/23/2010	< LLD
Brattleboro Fire Dept, West Station	4/6/2010	< LLD
Brattleboro Fire Dept, West Station	4/19/2010	< LLD
Brattleboro Fire Dept, West Station	5/4/2010	< LLD
Brattleboro Fire Dept, West Station	5/25/2010	< LLD
Brattleboro Fire Dept, West Station	6/8/2010	< LLD
Brattleboro Fire Dept, West Station	6/22/2010	< LLD
Brattleboro Fire Dept, West Station	7/6/2010	< LLD
Brattleboro Fire Dept, West Station	7/20/2010	< LLD
Brattleboro Fire Dept, West Station	8/10/2010	< LLD
Brattleboro Fire Dept, West Station	8/24/2010	< LLD
Brattleboro Fire Dept, West Station	9/7/2010	< LLD
Brattleboro Fire Dept, West Station	9/21/2010	< LLD
Brattleboro Fire Dept, West Station	10/5/2010	< LLD
Brattleboro Fire Dept, West Station	10/19/2010	< LLD
Brattleboro Fire Dept, West Station	11/9/2010	< LLD
Brattleboro Fire Dept, West Station	11/22/2010	< LLD
Brattleboro Fire Dept, West Station	12/7/2010	< LLD
Brattleboro Fire Dept, West Station	12/21/2010	< LLD
Miller Farm	1/8/2010	Natural
Miller Farm	1/21/2010	Natural
Miller Farm	1/27/2010	Natural
Miller Farm	2/2/2010	Natural
Miller Farm	2/9/2010	Natural
Miller Farm	2/23/2010	Natural
Miller Farm	3/9/2010	Natural
Miller Farm	3/15/2010	Natural
Miller Farm	3/23/2010	Natural
Miller Farm	4/6/2010	Natural
Miller Farm	4/19/2010	< LLD
Miller Farm	5/4/2010	Natural

Sample Location	Date of Sample	Gamma Spectrometry Result
Miller Farm	5/25/2010	< LLD
Miller Farm	6/8/2010	Natural
Miller Farm	6/22/2010	Natural
Miller Farm	7/6/2010	Natural
Miller Farm	7/20/2010	Natural
Miller Farm	8/10/2010	Natural
Miller Farm	8/24/2010	Natural
Miller Farm	9/7/2010	Natural
Miller Farm	9/21/2010	< LLD
Miller Farm	10/5/2010	Natural
Miller Farm	10/19/2010	Natural
Miller Farm	11/9/2010	< LLD
Miller Farm	11/22/2010	< LLD
Miller Farm	12/7/2010	Natural
Miller Farm	12/21/2010	Natural
Residence - 1	2/9/2010	Natural
Residence - 1	2/23/2010	Natural
Residence - 1	3/9/2010	Natural
Residence - 1	3/23/2010	Natural
Residence - 1	4/6/2010	Natural
Residence - 1	4/19/2010	< LLD
Residence - 1	5/4/2010	Natural
Residence - 1	5/25/2010	< LLD
Residence - 1	6/8/2010	Natural
Residence - 1	6/22/2010	Natural
Residence - 1	7/6/2010	Natural
Residence - 1	7/20/2010	Natural
Residence - 1	8/10/2010	Natural
Residence - 1	8/24/2010	< LLD
Residence - 1	9/7/2010	< LLD
Residence - 1	9/21/2010	Natural
Residence - 1	10/5/2010	Natural
Residence - 1	10/19/2010	Natural

Sample Location	Date of Sample	Gamma Spectrometry Result
Residence - 1	11/9/2010	< LLD
Residence - 1	11/22/2010	< LLD
Residence - 1	12/7/2010	Natural
Residence - 1	12/21/2010	Natural
Residence - 2	2/22/2010	< LLD
Residence - 2	3/8/2010	Natural
Residence - 2	3/9/2010	< LLD
Residence - 2	3/23/2010	Natural
Residence - 2	4/6/2010	< LLD
Residence - 2	4/19/2010	< LLD
Residence - 2	5/4/2010	< LLD
Residence - 2	5/25/2010	< LLD
Residence - 2	6/8/2010	< LLD
Residence - 2	6/22/2010	< LLD
Residence - 2	12/7/2010	< LLD
Residence - 2	12/21/2010	< LLD
Residence - 3	2/8/2010	Natural
Residence - 3	2/23/2010	Natural
Residence - 3	3/9/2010	< LLD
Residence - 3	3/23/2010	Natural
Residence - 3	4/6/2010	Natural
Residence - 3	4/19/2010	< LLD
Residence - 3	5/4/2010	Natural
Residence - 3	5/25/2010	Natural
Residence - 3	6/8/2010	Natural
Residence - 3	6/22/2010	Natural
Residence - 3	7/6/2010	Natural
Residence - 3	7/20/2010	Natural
Residence - 3	8/10/2010	Natural
Residence - 3	8/24/2010	< LLD
Residence - 3	9/7/2010	Natural
Residence - 3	9/21/2010	Natural
Residence - 3	10/5/2010	Natural

Sample Location	Date of Sample	Gamma Spectrometry Result
Residence - 3	10/19/2010	Natural
Residence - 3	11/22/2010	< LLD
Residence - 3	12/7/2010	Natural
Residence - 3	12/21/2010	Natural
Vernon Elementary School	1/8/2010	Natural
Vernon Elementary School	1/21/2010	Natural
Vernon Elementary School	1/25/2010	Natural
Vernon Elementary School	1/27/2010	Natural
Vernon Elementary School	2/1/2010	< LLD
Vernon Elementary School	2/2/2010	Natural
Vernon Elementary School	2/8/2010	Natural
Vernon Elementary School	2/9/2010	Natural
Vernon Elementary School	2/16/2010	Natural
Vernon Elementary School	2/23/2010	Natural
Vernon Elementary School	2/23/2010	Natural
Vernon Elementary School	3/1/2010	< LLD
Vernon Elementary School	3/3/2010	Natural
Vernon Elementary School	3/8/2010	Natural
Vernon Elementary School	3/9/2010	Natural
Vernon Elementary School	3/15/2010	Natural
Vernon Elementary School	3/15/2010	Natural
Vernon Elementary School	3/23/2010	Natural
Vernon Elementary School	3/30/2010	Natural
Vernon Elementary School	4/6/2010	Natural
Vernon Elementary School	4/13/2010	Natural
Vernon Elementary School	4/19/2010	< LLD
Vernon Elementary School	4/27/2010	Natural
Vernon Elementary School	5/4/2010	Natural
Vernon Elementary School	5/25/2010	Natural
Vernon Elementary School	6/8/2010	Natural
Vernon Elementary School	6/22/2010	Natural
Vernon Elementary School	7/6/2010	< LLD
Vernon Elementary School	7/20/2010	Natural

Sample Location	Date of Sample	Gamma Spectrometry Result
Vernon Elementary School	8/10/2010	< LLD
Vernon Elementary School	8/24/2010	Natural
Vernon Elementary School	9/7/2010	< LLD
Vernon Elementary School	9/21/2010	Natural
Vernon Elementary School	10/5/2010	Natural
Vernon Elementary School	10/19/2010	Natural
Vernon Elementary School	11/9/2010	< LLD
Vernon Elementary School	11/22/2010	< LLD
Vernon Elementary School	12/7/2010	Natural
Vernon Elementary School	12/21/2010	Natural
Vernon EOC (Edson House)	2/1/2010	< LLD
Vernon EOC (Edson House)	2/8/2010	< LLD
Vernon EOC (Edson House)	2/22/2010	< LLD
Vernon EOC (Edson House)	3/22/2010	Natural
Vernon EOC (Edson House)	4/5/2010	Natural
Vernon EOC (Edson House)	4/19/2010	< LLD
Vernon EOC (Edson House)	5/3/2010	Natural
Vernon EOC (Edson House)	5/24/2010	< LLD
Vernon Green Nursing Home	1/18/2010	< LLD
Vernon Green Nursing Home	1/25/2010	Natural
Vernon Green Nursing Home	2/1/2010	Natural
Vernon Green Nursing Home	2/8/2010	Natural
Vernon Green Nursing Home	2/22/2010	Natural
Vernon Green Nursing Home	2/23/2010	Natural
Vernon Green Nursing Home	3/3/2010	Natural
Vernon Green Nursing Home	3/8/2010	Natural
Vernon Green Nursing Home	3/9/2010	Natural
Vernon Green Nursing Home	3/23/2010	Natural
Vernon Green Nursing Home	4/6/2010	Natural
Vernon Green Nursing Home	4/19/2010	< LLD
Vernon Green Nursing Home	5/4/2010	Natural
Vernon Green Nursing Home	5/25/2010	< LLD
Vernon Green Nursing Home	6/8/2010	Natural

Sample Location	Date of Sample	Gamma Spectrometry Result
Vernon Green Nursing Home	6/22/2010	Natural
Vernon Green Nursing Home	7/6/2010	Natural
Vernon Green Nursing Home	7/20/2010	Natural
Vernon Green Nursing Home	8/10/2010	Natural
Vernon Green Nursing Home	8/24/2010	< LLD
Vernon Green Nursing Home	9/7/2010	Natural
Vernon Green Nursing Home	9/21/2010	Natural
Vernon Green Nursing Home	10/5/2010	Natural
Vernon Green Nursing Home	10/19/2010	Natural
Vernon Green Nursing Home	11/9/2010	Natural
Vernon Green Nursing Home	11/22/2010	< LLD
Vernon Green Nursing Home	12/7/2010	Natural
Vernon Green Nursing Home	12/21/2010	< LLD
COB Well (total well)	1/18/2010	< LLD
COB Well (total well)	1/25/2010	< LLD
COB Well (total well)	2/3/2010	Natural
COB Well (total well)	2/8/2010	Natural
COB Well (total well)	2/16/2010	Natural
COB Well (packer testing, 300-320 feet)	9/23/2010	< LLD
COB Well (packer testing, 200-220 feet)	10/2/2010	Natural
Main Well	1/18/2010	< LLD
Main Well	1/25/2010	Natural
Main Well	2/1/2010	Natural
Main Well	2/8/2010	Natural
Main Well	2/16/2010	Natural
Main Well	3/1/2010	Natural
Main Well	3/30/2010	Natural
Main Well	4/12/2010	Natural
Main Well	4/26/2010	Natural
Main Well	5/24/2010	Natural
Main Well	8/4/2010	< LLD
Main Well	8/24/2010	< LLD

Sample Location	Date of Sample	Gamma Spectrometry Result
Main Well	9/7/2010	< LLD
Main Well	9/21/2010	< LLD
Main Well	10/7/2010	< LLD
Main Well	11/3/2010	< LLD
Main Well	12/7/2010	Natural
PSB Well	1/18/2010	< LLD
PSB Well	1/25/2010	Natural
PSB Well	2/1/2010	Natural
PSB Well	2/8/2010	Natural
PSB Well	2/17/2010	Natural
PSB Well	2/24/2010	Natural
PSB Well	3/1/2010	Natural
PSB Well	3/30/2010	Natural
PSB Well	4/12/2010	< LLD
PSB Well	4/26/2010	Natural
PSB Well	5/24/2010	Natural
PSB Well	10/8/2010	< LLD
PSB Well	11/3/2010	< LLD
PSB Well	12/7/2010	< LLD
VY Garage	2/1/2010	< LLD
VY Garage	2/8/2010	< LLD
VY Garage	2/22/2010	< LLD
VY Garage	3/8/2010	< LLD
VY Garage	3/22/2010	Natural
VY Garage	4/5/2010	Natural
VY Garage	4/19/2010	< LLD
VY Garage	5/3/2010	Natural
VY Garage	5/24/2010	< LLD
White House	2/1/2010	< LLD
White House	2/8/2010	< LLD
White House	2/23/2010	Natural
White House	3/8/2010	Natural

Sample Location	Date of Sample	Gamma Spectrometry Result
White House	3/22/2010	Natural
White House	4/5/2010	< LLD
White House	4/19/2010	Natural
White House	5/3/2010	Natural
White House	5/24/2010	< LLD
White House	12/7/2010	< LLD
< LLD means less than the Laboratory's Lower Limit of Detection		
Natural means gamma-emitting materials detected are not related to nuclear power stations or above-ground weapons testing		

Appendix C

2010 Hard-to-Detect Water Data

Gamma spectroscopy results for all water samples tested by the Health Department in 2010 are provided in this appendix. Results are presented in alphabetical order by sample location and by sampling date based on the following categories:

- Connecticut River samples
- On-site groundwater monitoring wells
- Off-site drinking water wells
- On-site drinking water wells[3]

Lower limit of detections (LLDs) for water samples:

Iron-55: 50 pCi/L

Nickel-63: 5.0 pCi/L

Strontium-90[4]: 2.0 pCi/L

[3] Note: the COB well was off-line as a drinking water well as of February 25, 2010.
[4] Strontium-89 lower limit of detection varied due to shorter half-life.

Sample Location	Date of Sample	Iron-55	Nickel-63	Strontium-89	Strontium-90
3-3 Connecticut River Station	3/13/2010	< LLD	< LLD	< LLD	< LLD
3-3 Connecticut River Station	6/15/2010	< LLD	< LLD	< LLD	< LLD
3-3 Connecticut River Station	8/17/2010	< LLD	< LLD	< LLD	< LLD
3-3 Connecticut River Station	11/16/2010	< LLD	< LLD	< LLD	< LLD
3-4 Connecticut River Station	3/13/2010	< LLD	< LLD	< LLD	< LLD
3-4 Connecticut River Station	6/15/2010	< LLD	< LLD	< LLD	< LLD
3-4 Connecticut River Station	8/17/2010	< LLD	< LLD	< LLD	< LLD
3-4 Connecticut River Station	11/16/2010	< LLD	< LLD	< LLD	< LLD
3-8 Connecticut River Station	3/13/2010	< LLD	< LLD	< LLD	< LLD
3-8 Connecticut River Station	6/15/2010	< LLD	< LLD	< LLD	< LLD
3-8 Connecticut River Station	8/17/2010	< LLD	< LLD	< LLD	< LLD
3-8 Connecticut River Station	11/16/2010	< LLD	< LLD	< LLD	< LLD
Connecticut River Downstream	3/23/2010	< LLD	< LLD	< LLD	< LLD
Connecticut River Downstream	6/22/2010	< LLD	< LLD	< LLD	< LLD
Connecticut River Downstream	8/10/2010	< LLD	< LLD	< LLD	< LLD
Connecticut River Upstream	3/23/2010	< LLD	< LLD	< LLD	< LLD
Connecticut River Upstream	6/22/2010	< LLD	< LLD	< LLD	< LLD
Connecticut River Upstream	8/10/2010	< LLD	< LLD	< LLD	< LLD
Discharge Forebay	3/13/2010	< LLD	< LLD	< LLD	< LLD
Discharge Forebay	6/15/2010	< LLD	< LLD	< LLD	< LLD
Discharge Forebay	8/17/2010	< LLD	< LLD	< LLD	< LLD
Discharge Forebay	11/16/2010	< LLD	< LLD	< LLD	< LLD
Upstream of the VY River Discharge	3/29/2010	< LLD	< LLD	< LLD	< LLD
Upstream of the VY River Discharge	6/21/2010	< LLD	< LLD	< LLD	< LLD
Upstream of the VY River Discharge	8/2/2010	< LLD	< LLD	< LLD	< LLD
Upstream of the VY River Discharge	11/1/2010	< LLD	< LLD	< LLD	< LLD
GZ-01	3/22/2010	< LLD	< LLD	< LLD	< LLD
GZ-01	6/2/2010	< LLD	< LLD	< LLD	< LLD
GZ-01	8/2/2010	< LLD	< LLD	< LLD	< LLD
GZ-01	10/4/2010	< LLD	< LLD	< LLD	< LLD
GZ-01	11/1/2010	< LLD	< LLD	< LLD	< LLD
GZ-02	3/22/2010	< LLD	< LLD	< LLD	< LLD
GZ-02	6/2/2010	< LLD	< LLD	< LLD	< LLD
GZ-02	8/2/2010	< LLD	< LLD	< LLD	< LLD
GZ-02	11/1/2010	< LLD	< LLD	< LLD	< LLD
GZ-03	3/29/2010	< LLD	< LLD	< LLD	< LLD
GZ-03	6/21/2010	< LLD	< LLD	< LLD	< LLD
GZ-03	8/19/2010	< LLD	< LLD	< LLD	< LLD
GZ-03	11/1/2010	< LLD	< LLD	< LLD	< LLD
GZ-04	3/29/2010	< LLD	< LLD	< LLD	< LLD
GZ-04	6/21/2010	< LLD	< LLD	< LLD	< LLD
GZ-04	8/19/2010	< LLD	< LLD	< LLD	< LLD
GZ-04	11/1/2010	< LLD	< LLD	< LLD	< LLD
GZ-05	3/29/2010	< LLD	< LLD	< LLD	< LLD
GZ-05	6/21/2010	< LLD	< LLD	< LLD	< LLD
GZ-05	8/2/2010	< LLD	< LLD	< LLD	< LLD
GZ-05	11/1/2010	< LLD	< LLD	< LLD	< LLD
GZ-06	3/29/2010	< LLD	< LLD	< LLD	< LLD
GZ-06	8/2/2010	< LLD	< LLD	< LLD	< LLD
GZ-06	11/2/2010	< LLD	< LLD	< LLD	< LLD
GZ-07	6/21/2010	< LLD	< LLD	< LLD	< LLD
GZ-07	8/19/2010	< LLD	< LLD	< LLD	< LLD
GZ-07	11/1/2010	< LLD	< LLD	< LLD	< LLD

Sample Location	Date of Sample	Iron-55	Nickel-63	Strontium-89	Strontium-90
GZ-09	3/15/2010	< LLD	< LLD	< LLD	< LLD
GZ-09	6/21/2010	< LLD	< LLD	< LLD	< LLD
GZ-09	8/2/2010	< LLD	< LLD	< LLD	< LLD
GZ-09	11/1/2010	< LLD	< LLD	< LLD	< LLD
GZ-10	3/29/2010	< LLD	< LLD	< LLD	< LLD
GZ-10	8/19/2010	< LLD	< LLD	< LLD	< LLD
GZ-11	3/29/2010	< LLD	< LLD	< LLD	< LLD
GZ-11	6/21/2010	< LLD	< LLD	< LLD	< LLD
GZ-11	8/2/2010	< LLD	< LLD	< LLD	< LLD
GZ-12D	12/6/2010	< LLD	< LLD	< LLD	< LLD
GZ-12S	3/29/2010	< LLD	< LLD	< LLD	< LLD
GZ-12S	6/21/2010	< LLD	< LLD	< LLD	< LLD
GZ-12S	8/19/2010	< LLD	< LLD	< LLD	< LLD
GZ-12S	11/1/2010	< LLD	< LLD	< LLD	< LLD
GZ-13D	3/29/2010	< LLD	< LLD	< LLD	< LLD
GZ-13D	8/19/2010	< LLD	< LLD	< LLD	< LLD
GZ-13D	11/1/2010	< LLD	< LLD	< LLD	< LLD
GZ-13S	3/29/2010	< LLD	< LLD	< LLD	< LLD
GZ-13S	6/28/2010	< LLD	< LLD	< LLD	< LLD
GZ-13S	8/19/2010	< LLD	< LLD	< LLD	< LLD
GZ-14D	3/29/2010	< LLD	< LLD	< LLD	< LLD
GZ-14D	6/28/2010	< LLD	< LLD	< LLD	< LLD
GZ-14D	8/19/2010	< LLD	< LLD	< LLD	< LLD
GZ-14S	3/29/2010	< LLD	< LLD	< LLD	< LLD
GZ-14S	6/21/2010	< LLD	< LLD	< LLD	< LLD
GZ-14S	8/19/2010	< LLD	< LLD	< LLD	< LLD
GZ-14S	11/1/2010	< LLD	< LLD	< LLD	< LLD
GZ-15	6/21/2010	< LLD	< LLD	< LLD	< LLD
GZ-15	8/19/2010	< LLD	< LLD	< LLD	< LLD
GZ-15	11/1/2010	< LLD	< LLD	< LLD	< LLD
GZ-16	3/29/2010	< LLD	< LLD	< LLD	< LLD
GZ-16	6/21/2010	< LLD	< LLD	< LLD	< LLD
GZ-16	8/2/2010	< LLD	< LLD	< LLD	< LLD
GZ-16	11/1/2010	< LLD	< LLD	< LLD	< LLD
GZ-17	3/29/2010	< LLD	< LLD	< LLD	< LLD
GZ-17	6/21/2010	< LLD	< LLD	< LLD	< LLD
GZ-17	8/2/2010	< LLD	< LLD	< LLD	< LLD
GZ-17	11/2/2010	< LLD	< LLD	< LLD	< LLD
GZ-19D	3/29/2010	< LLD	< LLD	< LLD	< LLD
GZ-19D	6/21/2010	< LLD	< LLD	< LLD	< LLD
GZ-19D	8/2/2010	< LLD	< LLD	< LLD	< LLD
GZ-19D	11/1/2010	< LLD	< LLD	< LLD	< LLD
GZ-19S	3/29/2010	< LLD	< LLD	< LLD	< LLD
GZ-19S	6/21/2010	< LLD	< LLD	< LLD	< LLD
GZ-19S	8/2/2010	< LLD	< LLD	< LLD	< LLD
GZ-19S	11/1/2010	< LLD	< LLD	< LLD	< LLD
GZ-20	3/29/2010	< LLD	< LLD	< LLD	< LLD
GZ-20	6/21/2010	< LLD	< LLD	< LLD	< LLD
GZ-20	8/19/2010	< LLD	< LLD	< LLD	< LLD
GZ-20	11/1/2010	< LLD	< LLD	< LLD	< LLD
GZ-21	6/21/2010	< LLD	< LLD	< LLD	< LLD
GZ-21	8/19/2010	< LLD	< LLD	< LLD	< LLD
GZ-21	11/1/2010	< LLD	< LLD	< LLD	< LLD

Sample Location	Date of Sample	Iron-55	Nickel-63	Strontium-89	Strontium-90
GZ-22D	12/6/2010	< LLD	< LLD	< LLD	< LLD
GZ-23S	12/6/2010	< LLD	< LLD	< LLD	< LLD
GZ-24S	12/6/2010	< LLD	< LLD	< LLD	< LLD
GZ-25S	12/6/2010	< LLD	< LLD	< LLD	< LLD
GZ-26S	12/6/2010	< LLD	< LLD	< LLD	< LLD
WVN0201	3/22/2010	< LLD	< LLD	< LLD	< LLD
WVN0201	6/2/2010	< LLD	< LLD	< LLD	< LLD
WVN0201	8/3/2010	< LLD	< LLD	< LLD	< LLD
WVN0201	11/4/2010	< LLD	< LLD	< LLD	< LLD
WVN0202	3/22/2010	< LLD	< LLD	< LLD	< LLD
WVN0202	6/2/2010	< LLD	< LLD	< LLD	< LLD
WVN0202	8/3/2010	< LLD	< LLD	< LLD	< LLD
WVN0202	11/4/2010	< LLD	< LLD	< LLD	< LLD
WVN0203	3/22/2010	< LLD	< LLD	< LLD	< LLD
WVN0203	6/2/2010	< LLD	< LLD	< LLD	< LLD
WVN0203	8/3/2010	< LLD	< LLD	< LLD	< LLD
WVN0203	11/4/2010	< LLD	< LLD	< LLD	< LLD
WVN0204	3/22/2010	< LLD	< LLD	< LLD	< LLD
WVN0204	6/2/2010	< LLD	< LLD	< LLD	< LLD
WVN0204	8/3/2010	< LLD	< LLD	< LLD	< LLD
WVN0204	11/3/2010	< LLD	< LLD	< LLD	< LLD
Blodgett Farm	3/23/2010	< LLD	< LLD	< LLD	< LLD
Blodgett Farm	6/22/2010	< LLD	< LLD	< LLD	< LLD
Blodgett Farm	8/10/2010	< LLD	< LLD	< LLD	< LLD
Blodgett Farm	11/9/2010	< LLD	< LLD	< LLD	< LLD
Miller Farm	3/23/2010	< LLD	< LLD	< LLD	< LLD
Miller Farm	6/22/2010	< LLD	< LLD	< LLD	< LLD
Miller Farm	8/10/2010	< LLD	< LLD	< LLD	< LLD
Miller Farm	11/9/2010	< LLD	< LLD	< LLD	< LLD
PSB Well	3/30/2010	< LLD	< LLD	< LLD	< LLD
PSB Well	11/3/2010	< LLD	< LLD	< LLD	< LLD
Residence - 1	3/23/2010	< LLD	< LLD	< LLD	< LLD
Residence - 1	6/22/2010	< LLD	< LLD	< LLD	< LLD
Residence - 1	8/10/2010	< LLD	< LLD	< LLD	< LLD
Residence - 1	11/9/2010	< LLD	< LLD	< LLD	< LLD
Residence - 2	3/23/2010	< LLD	< LLD	< LLD	< LLD
Residence - 2	6/22/2010	< LLD	< LLD	< LLD	< LLD
Residence - 2	12/7/2010	< LLD	< LLD	< LLD	< LLD
Residence - 3	3/23/2010	< LLD	< LLD	< LLD	< LLD
Residence - 3	6/22/2010	< LLD	< LLD	< LLD	< LLD
Residence - 3	8/10/2010	< LLD	< LLD	< LLD	< LLD
Residence - 3	12/7/2010	< LLD	< LLD	< LLD	< LLD
Vernon Elementary School	3/23/2010	< LLD	< LLD	< LLD	< LLD
Vernon Elementary School	6/22/2010	< LLD	< LLD	< LLD	< LLD
Vernon Elementary School	8/10/2010	< LLD	< LLD	< LLD	< LLD
Vernon Elementary School	11/9/2010	< LLD	< LLD	< LLD	< LLD
Vernon EOC (Edson House)	3/22/2010	< LLD	< LLD	< LLD	< LLD
Vernon Green Nursing Home	3/23/2010	< LLD	< LLD	< LLD	< LLD
Vernon Green Nursing Home	6/22/2010	< LLD	< LLD	< LLD	< LLD
Vernon Green Nursing Home	8/10/2010	< LLD	< LLD	< LLD	< LLD
Vernon Green Nursing Home	11/9/2010	< LLD	< LLD	< LLD	< LLD
Brattleboro Fire Dept, West Station	3/23/2010	< LLD	< LLD	< LLD	< LLD
Brattleboro Fire Dept, West Station	6/22/2010	< LLD	< LLD	< LLD	< LLD
Brattleboro Fire Dept, West Station	8/10/2010	< LLD	< LLD	< LLD	< LLD
Brattleboro Fire Dept, West Station	11/9/2010	< LLD	< LLD	< LLD	< LLD
COB Well (total well)	2/16/2010	< LLD	< LLD	< LLD	< LLD
COB Well (packer testing 300-320 feet)	9/23/2010	< LLD	< LLD	< LLD	< LLD
COB Well (packer testing 200-220 feet)	10/2/2010	< LLD	< LLD	< LLD	< LLD
Main Well	3/30/2010	< LLD	< LLD	< LLD	< LLD
Main Well	8/4/2010	< LLD	< LLD	< LLD	< LLD
Main Well	11/3/2010	< LLD	< LLD	< LLD	< LLD
VY Garage	3/22/2010	< LLD	< LLD	< LLD	< LLD
White House	3/22/2010	< LLD	< LLD	< LLD	< LLD

< LLD = Less than the Laboratory's Lower Level of Detection

Appendix D

2010 Advanced Off Gas (AOG) Soil Excavation Area and Data

The 2010 confirmed release of tritium in groundwater at Vermont Yankee marked an unintentional underground release of radioactive material. Soil testing confirmed that other materials contaminated the environment near the leak. Soil samples were collected at various depths around the Advanced Off Gas pipe tunnel excavation area (Figure 15). Nuclear power plant-related radioactive elements, manganese-64, cobalt-60, zinc-65 and cesium-137, were measured in the soil. The amounts measured were greater than expected from above-grounds weapons testing or nuclear fallout from global incidents like Chernobyl.

Soil samples were collected in February, March and May of 2010. A total of 40 samples were tested by gamma spectroscopy. Results from these soil samples are still pending hard-to-detect analyses.

This tested soil was removed from Vermont Yankee and disposed in a licensed facility and does not pose a risk of increased dose to a member of the general public. No radioactive materials found in the soil were measured in any water sample in 2010.

More detailed information on these samples can be found at:
http://healthvermont.gov/enviro/rad/yankee/soil_contamination.aspx#more

Figure 15. Advanced Off-Gas (AOG) Leak Area: Approximate Sample Sites

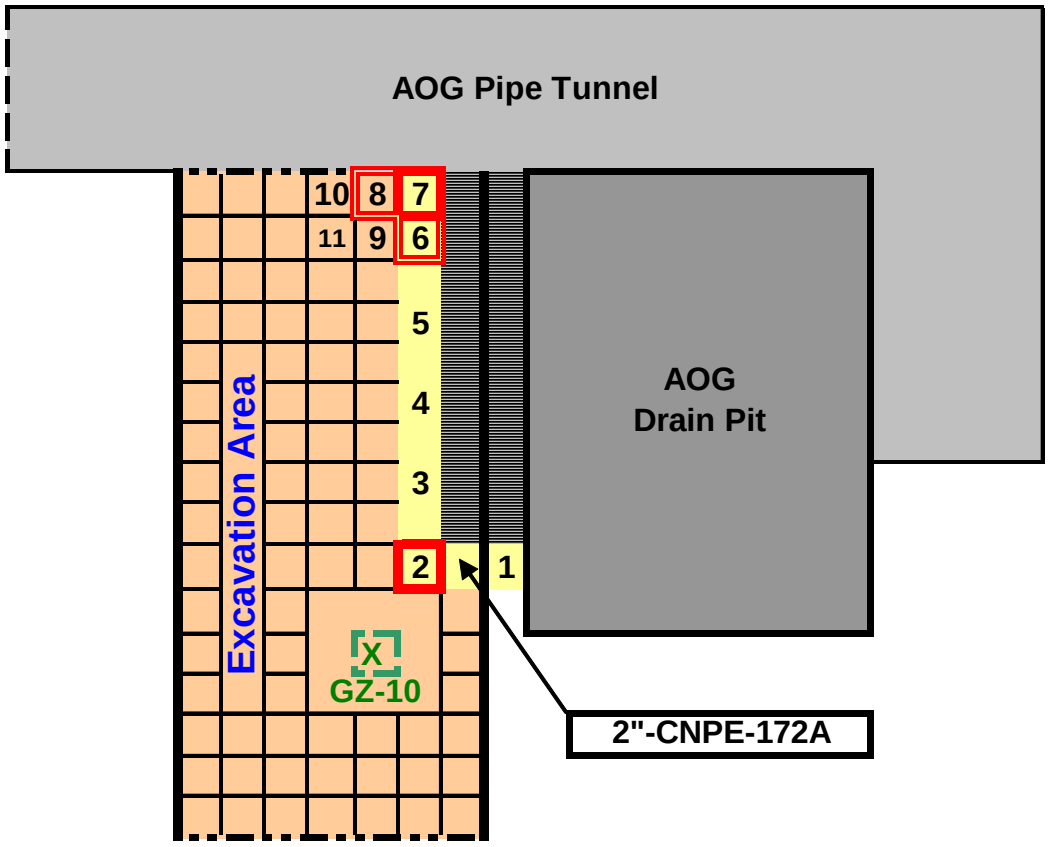

Table 24. February 2010 Soil Collected from Advanced Off Gas (AOG) Excavation Area Gamma Spectroscopy Results

Sample Location		Health Department Results (pCi/kg)			
AOG Site Number	Depth	Manganese-54	Cobalt-60	Zinc-65	Cesium-137
1 (*approx*)	surface of excavation	< LLD	< LLD	< LLD	< LLD
	2 feet below surface of excavation	< LLD	< LLD	< LLD	< LLD
	4 feet below surface of excavation	< LLD	< LLD	< LLD	< LLD
	6 feet below surface of excavation	< LLD	< LLD	< LLD	< LLD
2 (*approx*)	surface of excavation	55 +/- 21	295 +/- 38	86 +/- 54	292 +/- 27
	2 feet below surface of excavation	< LLD	< LLD	< LLD	< LLD
	4 feet below surface of excavation	< LLD	< LLD	< LLD	< LLD
	6 feet below surface of excavation	< LLD	< LLD	< LLD	< LLD
7 (*approx*)	surface of excavation	170 +/- 35	757 +/- 86	455 +/- 81	778 +/- 57
	2 feet below surface of excavation	164 +/- 28	881 +/- 113	379 +/- 86	669 +/- 50
	4 feet below surface of excavation	< LLD	183 +/- 35	< LLD	190 +/- 38
	6 feet below surface of excavation	< LLD	< LLD	< LLD	1,270 +/- 110
SW Corner of area	4 feet below surface of excavation	< LLD	< LLD	< LLD	< LLD
	6 feet below surface of excavation	< LLD	< LLD	< LLD	< LLD
NW corner of area	4 feet below surface of excavation	< LLD	< LLD	< LLD	692 +/- 53
	6 feet below surface of excavation	< LLD	< LLD	< LLD	1,110 +/- 90

< LLD means less than the Laboratory's Lower Limit of Detection

Site numbers are approximate to location in Figure 15.

Table 25. March 2010 Soil Collected from Advanced Off Gas (AOG) Excavation Area Gamma Spectroscopy Results

Sample Location		Health Department Results (pCi/kg)			
AOG Site Number	Depth	Manganese-54	Cobalt-60	Zinc-65	Cesium-137
1	surface of excavation	339 +/- 69	4550 +/- 480	884 +/- 202	980 +/- 88
	2 feet below surface of excavation	< LLD	< LLD	< LLD	173 +/- 35
2	surface of excavation	146 +/- 47	1,860 +/- 210	401 +/- 140	1,030 +/- 100
	2 feet below surface of excavation	< LLD	< LLD	< LLD	< LLD
3	surface of excavation	165 +/- 52	2,520 +/- 280	615 +/- 146	4,080 +/- 260
	2 feet below surface of excavation	< LLD	< LLD	< LLD	< LLD
4	surface of excavation	85 +/- 38	821 +/- 98	382 +/- 106	628 +/- 66
	2 feet below surface of excavation	< LLD	< LLD	< LLD	< LLD
5	surface of excavation	75 +/- 21	472 +/- 56	139 +/- 56	446 +/- 35
	2 feet below surface of excavation	< LLD	< LLD	< LLD	< LLD
6	surface of excavation	< LLD	170 +/- 35	< LLD	326 +/- 45
	2 feet below surface of excavation	< LLD	< LLD	< LLD	884 +/- 80
7	surface of excavation	< LLD	652 +/- 82	315 +/- 111	1,080 +/- 80
	2 feet below surface of excavation	163 +/- 28	1,160 +/- 130	535 +/- 85	733 +/- 51
8	surface of excavation	< LLD	< LLD	< LLD	544 +/- 61
	2 feet below surface of excavation	< LLD	298 +/- 50	< LLD	951 +/- 86
9	surface of excavation	< LLD	145 +/- 45	< LLD	1,020 +/- 90
	2 feet below surface of excavation	< LLD	< LLD	< LLD	149 +/- 25
10	surface of excavation	65 +/- 28	458 +/- 62	137 +/- 87	326 +/- 46
	2 feet below surface of excavation	< LLD	< LLD	< LLD	< LLD
11	surface of excavation	142 +/- 45	1,830 +/- 200	499 +/- 133	1,670 +/- 120
	2 feet below surface of excavation	< LLD	< LLD	< LLD	38 +/- 17

< LLD means less than the Laboratory's Lower Limit of Detection
Site numbers are approximate to location in Figure 15.

Table 26. May 2010 Soil Collected from Advanced Off Gas (AOG) Excavation Area Gamma Spectroscopy Results

Sample Location	Health Department Results (pCi/kg)			
AOG Area	Manganese-54	Cobalt-60	Zinc-65	Cesium-137
North End of AOG	< LLD	104 +/- 20	< LLD	96 +/- 22
South End of AOG	< LLD	465 +/- 59	< LLD	368 +/- 36

< LLD means less than the Laboratory's Lower Limit of Detection