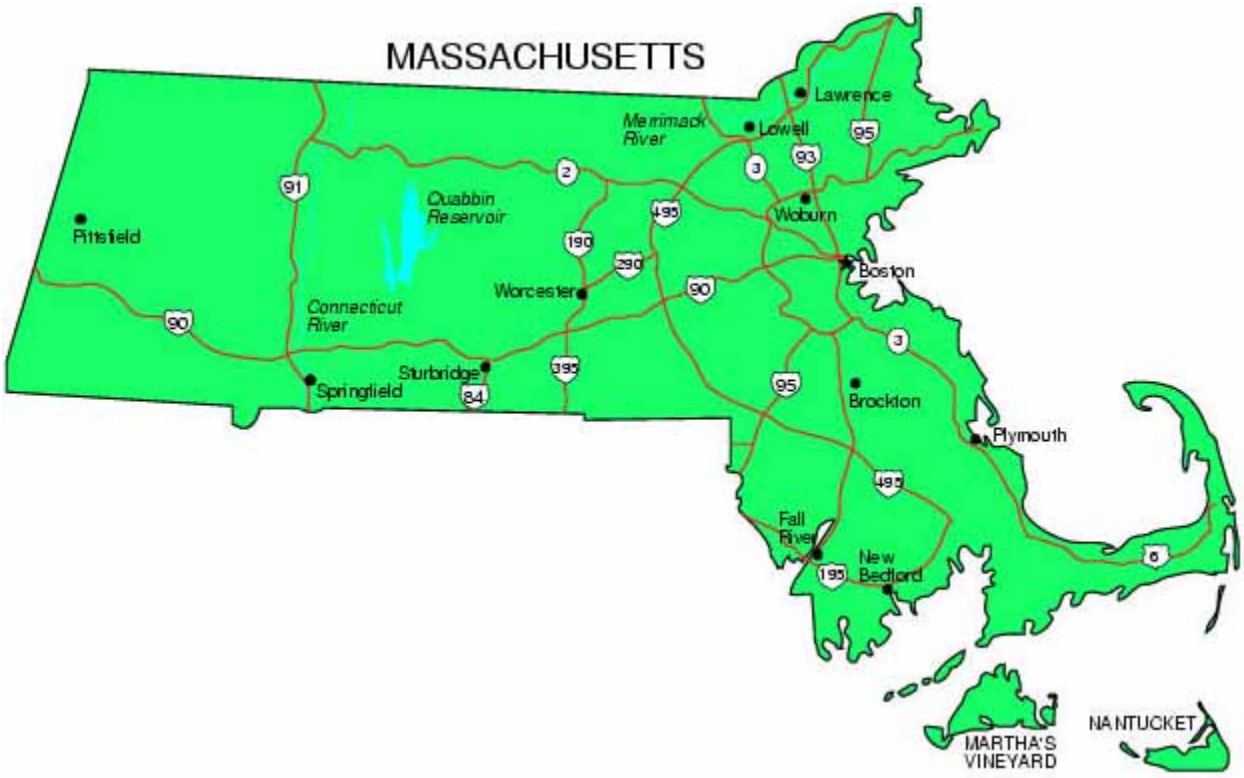
2004 MASSACHUSETTS LOW - LEVEL RADIOACTIVE WASTE SURVEY REPORT



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2004 MASSACHUSETTS LOW - LEVEL RADIOACTIVE WASTE SURVEY REPORT

JUNE 2006

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PREFACE

The Low-Level Radioactive Waste Management Board (Board) was established pursuant to the provisions of section 2 of Chapter 111H of the Massachusetts General Laws, and was the lead state agency responsible for planning and affecting the management of low-level radioactive waste (LLRW) in the Commonwealth. In 2002 the Board was abolished and its powers and duties were transferred to the Department of Public Health (DPH). The Radiation Control Program (RCP) under DPH is the lead agency now responsible.

The Massachusetts Low-Level Radioactive Waste Management Act (Chapter 111H) mandates under section 7 that each person who generates, treats, stores, transports, or disposes of LLRW within the Commonwealth shall annually provide detailed and accurate information concerning the types, volumes, radioactivity, sources, and characteristics of the LLRW produced as well as current and projected LLRW management activities, including source minimization, volume minimization, and on-site storage, treatment, packaging, and transportation practices as the DPH deems necessary.

DPH conducts an annual survey to determine the characteristics of LLRW generated, stored, and transferred for out-of-state disposal. The less complex 2004 survey differed from pre-1997 Board surveys since questions on management methods and characteristics, container and packing methods, storage off or on site, routine or non-routine waste, specific out-of-state disposal sites, and future projection were eliminated. A copy of the 3-page 2004 survey used is shown as figure 29.

This report summarizes data compiled from responses to the Calendar Year (CY) 2004 Radioactive Waste Survey of radioactive materials users licensed in Massachusetts by the U.S. Nuclear Regulatory Commission (NRC) and the Massachusetts Department of Public Health. The data provided by the generators in the annual survey is used in connection with DPH's activities to arrange storage, treatment, and disposal solutions for LLRW generated in Massachusetts and to formulate LLRW policy in the Commonwealth.

Comments on this document and suggestions for future survey reports are welcome and should be addressed to:

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The focus of this report is on the characteristics and management of LLRW in the Commonwealth. The data collected enables DPH to formulate policy on the LLRW storage, treatment, disposal, and other management activities. This survey system is used by DPH to determine which classes of LLRW with relatively short half-lives may be stored for natural radioactive decay, which classes will require disposal, and which classes will require special management procedures during the life of a disposal facility accepting LLRW in the Commonwealth, should such a facility be necessary.

The annual survey also is used with DPH's activities to arrange storage, treatment, and disposal solutions for the LLRW generated in Massachusetts. Both in-state and out-of-state disposal options require the detailed characterization of: (1) the total waste inventory placed in a facility throughout its operating life; and (2) the amounts of activity remaining in the facility during the closure. The annual survey is the primary data source for the facility inventory projections.

2004 Survey Report Contents

Chapter 1 is an Executive Summary, highlighting volume and activity data on LLRW generated for disposal in 2004, and showing the distribution of large and small generators. Chapter 2 presents generator categories, classes, management discussion, and transfer disposal rates past, present, and future. Chapter 3 contains national data with a state-by-state comparison of volume and activity shipped for disposal to the facilities in Barnwell, South Carolina; Clive, Utah; and Richland, Washington. Chapter 4 discusses financial aspects and LLRW billing formula used.

Appendix A contains numerous tables and figures.

Tables and figures in this report present survey responses rounded by standard methods, and therefore totals may not equal 100%.

Chapter 1

Executive Summary

1.1 2004 Survey Results Summary

Waste generators consist of those licensees either transferring or storing LLRW, or both. During 2004 Massachusetts waste generators reported that they generated **228,086.85 cubic feet** of low-level radioactive waste (LLRW) containing **6,350.48 curies**. Of this volume and activity, **222,996.43 cubic feet** containing **229.27 curies** were transferred and **5,080.48 cubic feet** containing **6,121.22 curies** were stored in-state for further treatment and disposal. A total of **57 different isotopes** were reported generated with Tritium (H-3) being the most common and with a total of 124 generator reports for all classes of waste. The number of licensees has decreased by 6 from 2003, and number of waste generators has increased by one from 2003.

The last survey report completed by the Board was in 1999 for calendar year 1997. No formal survey reports were compiled for years 1998-2001 by the Board or DPH. DPH completed a formal survey in 2002 for the first time. The 2002 and 2003 surveys are available on line at the following link: www.state.ma.us/dph/rcp under the heading **Radiation Control Topics**, then under the heading **ALow Level Radioactive Waste.**

The 2004 volume totals have almost doubled from the 2003 results while the activity totals have decreased by over 18 %. The main reason for a decrease in activity totals is Entergy Nuclear Generation Company reported only those volumes and activity of waste actually generated and transferred for 2004, rather than transferred for 2004 regardless of year generated. The main reason for an increase in volume totals is Yankee Atomic Electric Company's increased decommissioning work in Rowe, MA.

Massachusetts generators had access to three disposal facilities in the country that accept LLRW: Barnwell, South Carolina; Clive, Utah; and Richland, Washington. Barnwell accepted Class A, B, C and HVLA LLRW, but no waste mixed with, or exhibiting characteristics of, toxic chemical hazardous material (called mixed waste). The Clive site accepted only Class A and HVLA LLRW while Richland facility accepted only Massachusetts waste from naturally-occurring or accelerator-produced radioactive material (NARM).[1] These three disposal sites, however, are a temporary solution to LLRW management in Massachusetts.

Since Massachusetts is classified as an **unaffiliated state** and not a member of any of the ten national interstate compacts for low-level waste disposal, generators in Massachusetts are free to

[1]NARM is naturally-occurring and accelerator produced radioactive material and is not regulated by the NRC. While this responsibility currently lies with the individual states, it should be noted that the Energy Policy Act of 2005 grants NRC the authority to regulate certain NARM sources. The transition to NRC authority has not yet occurred.

dispose of their LLRW to any licensed facility willing to accept it. A national map showing the various compact memberships is shown as figure 1.

Some 175,415 cf or 99.81 % of the volume of LLRW containing 61.08 curies or 4.19 % of the activity was shipped to the Clive, Utah facility. The Barnwell, South Carolina facility received only 324.567 cf or 0.19 % of the volume of LLRW, but 1,398.049 curies or 95.81 % of the activity.

No LLRW was shipped to the Richland, Washington facility during 2004. Thus the highest activity LLRW goes to Barnwell site, and the highest volume LLRW goes to Clive site, according to the disposal site's manifest documents. The reported totals in and out do not match up, and are discussed later in the report in Chapter 3.

Since the survey eliminated the questions regarding licensee's future projections, DPH estimates with some confidence (plus or minus 10%) that total statewide future annual LLRW projections until 2012 will remain constant at 80,000 cubic feet and 20,000 curies. These numbers include both LLRW transferred and stored**.**

1.2 Distribution of Large and Small Generators by Transfers

Ninety-three organizations reported transferring LLRW for disposal in 2004, representing an increase of 5.7 % over 88 reported in 2003. Of the 93 organizations **75** or **80.6 %** shipped 100 cubic feet or less (100 cubic feet is equivalent to just over thirteen 55-gallon drums) and can be classified as small quantity generators, greater than the number in 2003 which was 69.

Of the 93 organizations **88** generators or **94. 6%** shipped 1.000 curie or less and can be classified as small activity generators, greater than the number in 2003 which was 79.

Tables 1 and 2 show the distribution by volume and activity of organizations that shipped large amounts of LLRW in 2004. Because the volume of waste transferred does not necessarily correlate with the amount of activity within the transferred waste, the 75 small quantity shippers by volume are not all the same small activity shippers. **In addition, these data show a consistent trend in Massachusetts: that most Massachusetts LLRW generators produce small volumes of waste requiring disposal in licensed LLRW disposal facilities,** and only a small amount **18 of 124 or 14. 5%** of Massachusetts generators produce large volumes (greater than 100 cubic feet) of waste requiring disposal.

Typical transfers by shipping are usually done by rail car, truck, or ship to one of three licensed disposal sites. The US Department of Transportation (DOT) has strict packaging requirements for shipping LLRW using three types of containers which are classified as either LSA, Type A, or Type B.

TABLE 1	
LIST OF 18 LARGE GENERATORS THAT TRANSFERRED MORE THAN 100.0 CUBIC FEET OF LLRW IN 2004	
FACILITY NAME	**VOLUME IN CUBIC FEET**
1. Yankee Atomic Electric Company	191,901.6
2. Entergy Nuclear Generating Company*	21,076.6
3. PerkinElmer Life & Analytical Science	3,050.5
4. Bristol-Myers Squibb Med. Img.	1,301.0
5. Charles River Laboratories, Inc.	595.0
6. Genzyme Corporation	550.0
7. Bartlett Nuclear, Inc.	515.5
8. Dana-Farber Cancer Institute	435.0
9. Millennium Pharmaceuticals	279.0
10. Molecular Insight Pharmaceuticals, Inc.	225.0
11. Novartis Inst. For Biomedical Research	181.0
12. Unitech Services Group, Inc.	173.0
13. Genetics Institute, LLC	130.8
14. Praecis Pharmaceuticals LP	120.0
15. Tufts University, Sch. of Med.	118.3
16. Astrazenica Pharmaceuticals LP	117.9
17. Framatome ANP, Inc.	110.0
18. Boston University Med. Ctr. Hospital	107.3

* and was generated in 2004 only

One hundred cubic feet of waste per annum is a threshold in Chapter 111H section 13, since those operations whose waste production exceed that threshold must develop and institute **a waste minimization program** predicated on detailed plans. More information is available in DPH Regulatory Guide No. 1.1 Revision 2.0 dated August 1995 and titled: Regulatory Guidance for Low - Level Radioactive Waste Minimization.

TABLE 2	
LIST OF 5 LARGE GENERATORS THAT TRANSFERRED MORE THAN 1.000 CURIE OF LLRW IN 2004	
FACILITY NAME	**ACTIVITY IN CURIES**
1. PerkinElmer Life & Analytical Science	87.569
2. Entergy Nuclear Generating Company*	63.300
3. Communications & Power Industries	46.600
4. Yankee Atomic Electric Company	24.470
5. Bristol-Myers Squibb Med. Img.	2.065

* and was generated in 2004 only

1.3 Distribution of Large and Small Waste Generators by Storage In-State

One hundred and seven organizations reported in-state storage of LLRW in 2004. Of the 107 organizations 94 or 87.9 % stored 100 cubic feet or less and can be classified as Asmall quantity@ in-state storage generators by volume. The list of the largest generators storing more than 100.0 cubic feet of waste in 2004 is shown in Table 3. Because the activity of waste in storage does not necessarily correlate with the amount of volume in storage, the 102 small activity in-state storage generators are not all the same small volume storage generators shippers. **In addition, these data show again a consistent trend in Massachusetts: that most Massachusetts LLRW generators produce small amounts of activity requiring disposal in licensed LLRW disposal facilities.**

Tables 3 and 4 show the storage by volume and activity of organizations that stored large amounts of LLRW in 2004. Because the volume of waste stored does not necessarily correlate with the amount of activity within the stored waste, the 94 small quantity storers by volume are not all the same small activity storers.

Of the 107 in-state storage generators, 102 or 95.3 % stored less than 1.000 curie and can be classified as small quantity in-state storage generators by activity. The list of 5 generators storing more than 1.000 curie of waste in 2004 is shown in Table 4.

Typical storage containers include 55 and 30 gallon steel drums and boxes. Other containers used less frequently are small steel pails or cans in the 2 to 5 gallon size and 9-10 cubic feet fiber drums used as temporary containment vessels prior to processing, such as incineration.

Table 3

LIST OF 13 LARGE GENERATORS THAT STORED MORE THAN 100.0 CUBIC FEET OF LLRW IN 2004

Facility Name	Waste Volume in Cubic Feet in Storage
1. PerkinElmer Life & Analytical Science	761.3
2. Genetics Institute, LLC	568.2
3. Toxikon Corporation	371.0
4. Entergy Nuclear Generating Company	317.9
5. AEA Technology QSA, Inc.	267.2
6. Mass. Institute of Technology	237.0
7. Mass. - Amherst, University of	198.4
8. Genzyme Corporation	175.0
9. Starment NMI	150.0
10. Brigham & Women’s Hospital	126.9
11. Unitech Services Group, Inc.	122.0
12. Pfizer, Inc.	118.2
13. Mass. General Hospital	109.5

TABLE 4	
LIST OF 5 LARGE GENERATORS THAT STORED 1.000 CURIE OR MORE OF LLRW IN 2004	
Facility Name	**Activity in Curies**
1. AEA Technology QSA, Inc.	5,471.620
2. PerkinElmer Life & Analytical Science	410.592
3. Entergy Nuclear generating Company	232.400
4. RMD, Inc., RMD Inst., LLC	1.000
5. Radiation Monitoring Device, Inc.	1.000

1.4 Distribution of Isotopes Generated for All Classes of Waste

A total of 57 different radionuclides were reported generated by all licensees which is an increase of one from 2003. The survey requested that responders only report those isotopes with a half life greater than 120 days, and this excludes most medical radionuclides such as I-125 and P-32. However all principal isotopes listed were grouped together with other radionuclides on the survey report in terms of volume and activity.

Figure 20 shows the total RAM (radioactive material) reporting frequency for the top 32 reported isotopes for all classes of waste.

The 25 least reported isotopes, with only 1-2 reports by licensees, are in decreasing order: U-depl, Tc-99m, Tc-99, Pm-147**,** Ag-108m, Hg-203, Xe-133, W-188, U-235, Tm-170, Th-232, Se-75, Zr-95, In-111, Ge-68, Eu-156, Eu-155, Eu-154, Eu-152, Cu-64, Co-58, Co-56, Cm-244, Ag-110m, and Kr-85. They are not listed in Figure 20.

Table 5 shows the ten most common isotopes by frequency of reports either transferred or in storage.

Table 5
LIST OF 10 MOST COMMON ISOTOPES REPORTED TRANSFERRED OR STORED IN 2004

Isotope	Half Life	Number of Facilities
1. H-3	12.3 years	107
2. C-14	5,730 years	82
3.I-125	60.14 days	25
4. P-32	14.29 days	23
5. Cs-137	30.17 years	21
6. S-35	87.4 days	20
7. Co-60	5.27 years	18
8. Fe-55	2.73 years	14
9. Co-57	271 days	13
10. P-33	25.4 days	12

1.5 Distribution of Isotopes Transferred for All Classes of Waste

A total of 50 different isotopes were reported transferred by all licensees which is a decrease of one from 2003. The totals transferred and stored do not necessarily add up to the totals generated since some licensees transfer and store the same isotope, while others either store or transfer the same isotope, but not both. Figure 26 shows the total RAM transferred for the top 26 reported isotopes for all classes of waste in 2004.

The 24 least reported isotopes transferred with only 1-2 reports each by licensees, are in decreasing order: Zn-65, Cl-36, U-depl, Tc-99, Ag-108m, Na-22, Eu-156, W-188, U-235, Th-232, Se-75, Pm-147, Kr-85, Zr-95, Ge-68, Eu-155, Eu-154, Eu-152, Cs-134, Co-58, Cm-244, Cd-109, Ag-110m, and In-111. They are not listed in Figure 26.

Table 6 shows the top 10 most common isotopes by frequency transferred for all classes of waste.

TABLE 6

LIST OF 10 MOST COMMON ISOTOPES REPORTED TRANSFERRED IN 2004		
Isotope	**Half Life**	**Number of Facilities**
1. H-3	12.3 years	69
2. C-14	5,730 years	55
3. Cs-137	30.17 years	18
4. Co-60	5.27 years	13
5. S-35	87.4 days	12
6. I-125	60.14 days	12
7. P-32	14.29 days	10
8. Co-57	271 days	10
9. Fe-55	2.73 years	10
10. Ni-63	100.1 years	8

1.6 Distribution of Isotopes In Storage for All Classes of Waste

A total of 36 different isotopes were reported in storage or stored by all licensees which is a decrease of one from 2003. The totals transferred and stored do not necessarily add up to the totals generated since some licensees transfer and store same the isotope, while others either store or transfer same isotope, but not both. Figure 25 shows the total RAM in storage for top 17 reported isotopes for all classes of waste in 2004.

The 19 least reported isotopes with only 1-2 reports each by licensees, are in decreasing order: Na-22, Cd-109, Tc-99m, Sr-90, Am-241, Xe-133, Tm-170, Tc-99, Ra-226, Pm-147, Zr-95, Hg-203, Eu-154, Eu-152, Cu-64, Co-58, Co-56, Cl-36, and Ni-63. They are not listed in Figure 25.

Table 7 shows the top 10 most common isotopes by frequency in storage for all classes of waste.

TABLE 7		
LIST OF 10 MOST COMMON ISOTOPES REPORTED STORED IN 2004		
Isotope	**Half Life**	**Number of Facilities**
1. H-3	12.3 years	81
2. C-14	5,730 years	62
3. P-32	14.29 days	16
4. I-125	60.14 days	16
5. S-35	87.4 days	11
6. Co-60	5.27 years	10
7. Cs-137	30.17 years	9
8. P-33	25.4 days	9
9. Fe-55	2.73 years	8
10. Co-57	271 days	6

1.7 Distribution of Isotopes Generated for Class A Wastes.

A total of 57 different isotopes or radionuclides were reported generated by all licensees which is an increase of 4 from 2003. Figure 21 shows the total RAM reporting frequency for the top 28 reported isotopes for Class A waste. The 3 most common were: H-3, C-14, and P-32. The 29 least reported isotopes with only one report each are: Ir-192, Ag-110m, Ce-144, Cm-243, Cm-244, Co-56, Co-58, Cu-64, Eu-152, Eu-154, Eu 155, Eu-156, Ge-68, Ag-108m, In-111, Zr-95, Kr-85, Pu-238, Pu-239, Pu-241, Sb-125, Se-75, Tc-99m, Th-232, Tm-170, U-235, W-188, Xe-133, and Hg-203. They are not listed in Figure 21.

1.8 Distribution of Isotopes Generated for Class B Wastes.

A total of 12 different isotopes were reported generated by all licensees which is double the number reported in 2003. Figure 22 shows the total RAM reporting frequency for all reported isotopes for Class B waste. The most common with two reports each were Sr-90, Cs-137, Ni-63, and Co-60.

1.9 Distribution of Isotopes Generated for Class C Wastes.

A total of 15 different isotopes were reported generated by all licensees in 2004 which is a decrease of 3 from 2003. Figure 23 shows the total RAM reporting frequency for all reported isotopes for Class C waste. The two most common reported isotopes with two reports each were C-14, and Co-60.

1.10 Distribution of Isotopes Generated for Class HVLA Wastes.

A total of 20 different isotopes were reported generated by all licensees which is an increase from 13 in 2003 due to a decommissioning project in Rowe, MA. Figure 24 shows the total RAM reporting frequency for all reported isotopes for Class HVLA waste. The two most common with 4-5 reports each were H-3, and C-14.

Chapter 2
2004 LLRW Management Data Summary

2.1 Sources and Types of LLRW

Low-level radioactive waste (LLRW) is radioactive material that (1) is neither high-level radioactive waste, nor spent fuel, nor uranium mill tailings; and (2) is classified by the U.S. Nuclear Regulatory Commission (NRC) as LLRW. It does not include waste which remains a federal responsibility, such as that owned or generated by the U.S. Department of Energy, the U.S. Navy as a result of decommissioning Navy vessels, or by the federal government as a result of any research, development, testing, or production of any atomic weapon.

LLRW is generated as a by-product of various uses of radionuclides. Typical applications include:

(1) the production of electricity by a nuclear power plant;

(2) the production and end-use of radiopharmaceuticals for medical procedures such as cancer and thyroid dysfunction diagnosis and treatment, radioimmunoassay, and diagnostic imaging examinations;

(3) research and development in the life science and biotechnology industry for the treatment and prevention of various diseases and medical dysfunctions, and in the environmental field to study the effects of chemicals on plant and aquatic life, and for ocean studies:

(4) commercial uses such as within instruments that measure level, thickness, and density or that are used in moisture analysis and quality control; sealed sources that are used for industrial radiography of pressure vessels and other structural welds; smoke detectors and exit signs in buildings and commercial aircraft; and

(5) university education and research in medicine, material science, and biotechnology.

2.2 Regulations Pertaining to Radioactive Materials Licensees

On March 21, 1997 Massachusetts became an **Agreement State** with the NRC. Under the agreement, the NRC transferred to the Commonwealth the responsibility for regulating the use of (1) radioactive materials produced as byproducts of the operation of nuclear reactors; (2) uranium and thorium source materials; and (3) small quantities of fissionable materials. NRC retains jurisdiction over regulation of nuclear reactors, federal agencies that use nuclear materials, and companies that distribute certain materials (e.g. smoke detectors) to the public.

Massachusetts radioactive material licensees are regulated by the DPH Radiation Control Program under 105 Code of Massachusetts Regulations (CMR) 120.000 Massachusetts Regulations for the Control Of Radiation and 345 CMR Low Level Radioactive Waste Management Board as amended. Licensees remaining under the jurisdiction of the NRC are regulated under Title 10 of the Code of Federal Regulations (CFR).

2.3 LLRW Generator Categories

In Massachusetts 524 colleges and universities, hospitals, government agencies, biotechnology firms, and other businesses, including two nuclear power plants (one operational and another undergoing decommissioning), held licenses[2] from the U.S. Nuclear Regulatory Commission **(**NRC) and the Massachusetts Department of Public health in 2004 to use or process source, special nuclear or byproduct material**.** This is a decrease of 7 from 2003.

Much of the information in this report is grouped by waste category of generator, of which there are five:

(1) **Academic** (Acad) - universities, colleges, and other research institutions

(2) **Commercial** (Comm) - organizations such as biotechnology, engineering, and construction companies, testing laboratories, radiopharmaceutical manufacturers and suppliers, and companies using radioactive materials for process, quality control, and analysis (also referred to as **industry** by Department of Energy (DOE).

(3) **Government** (Govt) - local, state, and federal entities. (Federal does not include DOE, US Navy, or atomic weapon productions, and state does not include universities and colleges.)

(4) **Health** - hospitals, clinics, and physicians (also referred to as **medical** by DOE)

(5) **Utility** - companies that operate or are decommissioning nuclear power plants

The categories listed above are convenient for data analysis, but there is an inherent interrelationship among them.

Figures 10-17 show the volumes and activity results for the 5 various waste generator categories according to survey results. The utility category leads the group as top volume generator from Figures 14 and 17 while the commercial category leads as top activity generator as shown in Figures 10 and 13. In storage activity and storage volume the commercial category leads the group according to Figures 11 and 15. In transferred activity the commercial category is the leader from Figure 12 while in transferred volume the utility category is the leader as shown in

[2]The total number of radioactive materials licensees and registrants in Massachusetts varies from time to time due to expiration or terminations of some licenses and registrations, and the issuance of new ones.

Figure 16. The government category generates the least amounts in all activity and volume productions.

2.4 Waste Classification System

Four classes of waste are defined by federal 10 CFR 61 and state DPH 105 CMR 120.299 Appendix E regulations[3].

Class A wastes are characterized by their low concentrations of long lived radionuclides and concentrations of short-lived radionuclides that will decay to acceptable levels within a 100-year institutional control period when a disposal facility is actively maintained after closure. These concentration limits have been calculated on the basis of dose limits to an individual who might inadvertently intrude, occupy the disposal site, and encounter waste after this time.

Class B wastes are the next level of wastes that could represent a potential hazard to an inadvertent intruder, without additional protective measures, since they contain higher concentrations of short-lived and long lived radionuclides. They must meet NRC's minimum stability requirements so that the waste forms or containers can maintain gross physical properties and identity, over 300 years thus limiting the exposure to a potential intruder.

Class C wastes are wastes that, due to their greater concentrations of long-lived or short-lived radionuclides, must meet more stringent waste form requirements to ensure stability, and must be disposed of in such a way as to protect the inadvertent intruder for a longer period of time. These wastes must meet the stability requirements for form or container (300 years) and must be disposed of in a manner which protects against inadvertent intrusion for at least 500 years.

Greater than Class C (GTCC) wastes are wastes whose larger concentrations of radionuclides make them unacceptable for near-surface land disposal, unlike classes A, B and C. GTCC disposal remain the responsibility of the federal government and their present strategy is deep geological disposal. GTCC is not LLRW. A federal burial site under consideration is located at Yucca Mountain in Nevada.

The fifth class of waste is not defined in NRC or DPH regulations, but only in old Board 345 CMR regulations is **HVLA** (High Volume Low Activity) wastes[4].

HVLA Waste are soils or demolition rubble that have average concentrations less than or equal to the concentrations set forth in 345 CMR 1.13, Table 1.13B and that have been accepted for disposal at a licensed LLRW disposal facility. HVLA is considered as Class A waste, but treated

[3]Website is www.state.ma.us/dph/rcp under heading quick links, click on heading regulations, then click on 105 CMR 120.200

[4]Website is www.state.ma.us/dph/rcp under heading quick links, click on heading regulations, then click on 345 CMR

separately in Massachusetts so as to allow some licensees a reduced annual LLRW fee of 90% of the proportional assessment.

Figures 2-9 and Table 8 show the volume and activity results for the four various waste classes. In terms of volume Class A waste was the biggest class in storage while HVLA Class HVLA waste was the most transferred class. In terms of activity Class C was the biggest class in storage while Class A was the most transferred class.

Some of the licensees generated more than one class of waste so the totals may not equal 100%.

2.5 LLRW Management Method Terms

LLRW management refers to the storage, packing, treatment, transportation, or disposal of LLRW. Some of the terms used in past surveys were:

- **Incineration for disposal** - refers to procedure where LLRW, such as animal carcasses and liquid scintillation fluids, are incinerated per 10 CFR 20 which limits specific activity of waste to 0.05 microcuries of Hydrogen-3 (Tritium) or Carbon-14, per gram of material.

- **mixed waste storage** - radioactive material contaminated by chemical or toxic material. Past surveys classified such waste with the addition of the letter AH@ after classification letter A, B, C, or HVLA. (i.e., Class AH, Class BH, etc.).

- **shipped for disposal** - refers to LLRW delivered directly, or via a processor, to one of three NRC-licensed disposal facilities located in SC, UT, and WA.

- **storage** - refers to LLRW that was generated during the survey year or prior years and that was held in storage. The waste may undergo additional radioactive decay prior to final packaging for disposal, and reported volume and activity may not reflect actual disposal properties.

- **storage for decay** - refers to procedure in which LLRW with a relatively short half-life is held for natural radioactive decay (at least 10 half-lives). Storage for decay is a common practice.

- **transfer to an authorized recipient** - refers to transfer of radioactive material for disposal or recycling to another licensee, such as sealed sources returned to the supplier since the energy being emitted is no longer useful.

- **volume reduction** - refers to negative change in LLRW volume from sorting and segregating (the separation of the non-radioactive from the radioactive portion), compaction, incineration, and decontamination.

This survey did not ask the licensees which management method(s) was used as past pre 2001 surveys did.

2.6 Licensee LLRW Survey Results

The 2004 Radioactive Waste Survey requested data on LLRW produced during calendar year 2004 or retained in storage from previous years. The survey was mailed in January of 2005 to 524 companies and institutions licensed by the NRC and DPH in any time during 2004 to possess sources of ionizing radiation involving the use of radioactive materials in the Commonwealth; **514 or 98.1% of licensees returned the 2004 survey form which increased from a 85.2% return rate in 1997 and a 97.6% return rate in 2003.**

Licensees that did not return the form were evaluated by DPH to determine if they typically generate LLRW which requires disposal. Most non-respondents were identified as licensees that manage by storage for decay, or transfer sealed sources[5] to an authorized recipient, or do not generate any LLRW. Some of the 2004 licensees had gone out of business and were unable to receive the survey form as they had no forwarding address. To correct that deficiency in the future DPH is now surveying the licensees as their license is terminated and not waiting to the following year to mail out the survey form. Seven out of the ten unresponsive licensees have been terminated, and three will have their license amended to possession only.

DPH is exploring the possibility of having licensees with an e-mail address on file (currently 85.6% and up from 81.2% in 2003) complete the 2005 annual radiation waste surveys **on line** using a DPH assigned password. This would be optional. **Comments regarding this proposed new procedure are encouraged.**

Table 8 shows that 124 licensees (24.1%) of the 515 who responded reported producing LLRW for transfer or in storage during 2004. That is an increase from 23.7% reported in 2003. The remainder used sealed sources or did not generate any long lived (half- life greater than 120 days) LLRW during 2004.

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Table 8 - 2004 Activity and Volume Summary:

- 228,086.85 cubic feet of LLRW containing 6,350.48 curies were generated during 2004
- 758.57 curies (11.9 %) were from Class A LLRW
- 243.52 curies (3.8 %) were from Class B LLRW
- 5,346.41 curies (84.2%) were from Class C LLRW

[5]Sealed sources are usually returned to the manufacturer for recycling or disposal. The most common sealed source is lead paint detector containing the accelerator-produced radionuclide Cobalt 57 (Co-57).

- 1.99 curies (0.03%) were from Class HVLA LLRW
- 35,395.79 cubic feet (15.5 %) were Class A LLRW
- 165.17 cubic feet (0.07%) were Class B LLRW
- 246.50 cubic feet (0.11 %) were Class C LLRW
- 192,279.39 cubic feet (84.3 %) were Class HVLA LLRW
- 222,996.43 cubic feet (97.8 %) containing 229.27 curies (3.6 %) of LLRW were transferred to licensed brokers[6] or disposal sites for disposal out of Massachusetts
- 5,080.48 cubic feet (2.2%) containing 6,121.22 curies (96.4 %) of LLRW were placed in storage in Massachusetts

[6] Website is National Directory of Brokers and Processors www.bpdirectory.com for a listing

TABLE 8

Activity and Volume by Class for the Year: 2004

Class	*No. Submitted in the Class*	*Activity(curies)*			*Volume (cu. ft.)*		
		In Storage	*Transferred*	*TOTAL*	*In Storage*	*Transferred*	*TOTAL*
A	144	573.23	185.34	758.57	4,607.28	30,778.57	35,395.79
B	4	242.07	1.45	243.52	161.76	3.41	165.17
C	3	5,305.79	40.61	5,346.41	96.50	150.00	246.50
HVLA	12	0.13	1.86	1.99	214.94	192,064.45	192,279.39
Grand Totals:	163	6,121.22	229.27	6,350.48	5,080.48	222,996.43	228,086.85

Total Number of Surveys Submitted for 2004 : **515**

Number Without Any Waste Generation for 2004 : **391**

Number With Waste Generation for 2004 : **124**

Note: Some licensees generated more than one class, and totals may not equal 100%.

2.7 MA Historic, Current and Projected Annual Transfer Disposal Rate Results

Figure 18 shows total cubic feet of LLRW that were transferred from 1994-2004 with the exception of years 1998-2001 for which no published data is available. Although the old LLRW Board was funded until 2002, the last report was for 1997 and printed in 1999. With the exception of 1996, the amounts transferred decreased annually from 1,082,172 cf in 1994 to 30,920.68 cf in 2002, then increased again in 2003 to 127,263.11 cf, and finally increased again in 2004 to 222,996.43 cf.

The 1996 cf transfer spike was influenced by the closure of Barnwell disposal site during 6 months in 1995. During that time many generators placed LLRW in storage until it reopened in 1996, and then shipped it. The 2004 transfer increase in volume was mainly due to increased utility transfers from a decommissioning project in Rowe.

The present survey does not distinguish between **routine** and **non-routine** LLRW shipped for disposal. Routine refers to LLRW from process operations that is expected to be generated annually for the foreseeable future. Non-routine refers to LLRW from one time decommissioning or site remediation projects. A non-routine example is a decommissioning project at the former nuclear power plant operated by Yankee Atomic Electric Company in Rowe, and one for site remediation is Starmet NMI (formerly Nuclear Metals, Inc.) in Concord.

Figure 19 shows total activity in curies of LLRW that was transferred from 1994-2004 with the exception of years 1998-2001 for which no published data is available. As discussed above, the figure shows decreasing amounts annually from 140,934 curies in 1994 to 876.61 curies in 2002, then an increase again in 2003 to 26,733.36 curies, and finally a decrease again in 2004 to 229.3 curies.

The survey eliminated the questions of licensees regarding future projections. However, DPH Radiation Control Program's staff estimates with some confidence (plus or minus 10%) that total statewide future annual LLRW projections until 2012 will remain constant at 80,000 cubic feet and 20,000 curies. These figures include both storage and transfers.

Chapter 3

NATIONAL DATA

3.1 State-by-State Comparison

Table 9 shows how Massachusetts LLRW volume and activity shipped for disposal compared to other states in 2004. These totals include high volume low activity (HVLA) wastes shipped out-of-state.

In terms of ranking Massachusetts with the 49 other states and District of Columbia (no data from Montana and Wyoming), Massachusetts ranked **5 th** largest in terms of volume generated (ME was largest at #1), and **13 th** largest in terms of activity generated (IL was largest at #1) as reported by the Manifest Information Management System (MIMS) in 2004. MIMS is operated by the US Department of Energy, and does not assure quality of information. The totals reported do not agree exactly with DPH LLRW survey results.

TABLE 9

2004 LLRW VOLUME AND ACTIVITY SUMMARY FROM ALL STATES FROM MIMS

Year Received	State	Volume (ft3)	Activity(curies)
2004	Alabama	17,303.15	44,289.30
2004	Alaska	14.10	0.01
2004	Arizona	73,500.04	228.45
2004	Arkansas	3,935.79	223.45
2004	Army Out U.S.	83.44	1.85
2004	California	82,765.34	814.16
2004	Colorado	508.20	0.20
2004	Connecticut	160,214.70	28,389.83
2004	Delaware	48.92	0.20
2004	Dist of Columbia	81.95	0.06
2004	Florida	16,471.10	479.18
2004	Georgia	9,606.45	3,138.96
2004	Hawaii	390.59	63.57
2004	Idaho	138.71	0.18
2004	Illinois	61,472.34	150,159.67
2004	Indiana	310.75	0.61
2004	Iowa	240.70	1.35
2004	Kansas	1,578.58	243.90
2004	Kentucky	65,455.85	8.86

2004	Louisiana	2,110.52	1,344.41
2004	Maine	1,450,244.47	163.60
2004	Maryland	13,176.99	11,830.71
2004	**Massachusetts**	**213,186.32**	**1,830.24**
2004	Michigan	34,030.99	338.26
2004	Minnesota	31,735.38	13,453.55
2004	Mississippi	1,647.85	840.14
2004	Missouri	93,371.42	309.67
2004	Montana	ND	ND
2004	Nebraska	2,897.81	699.25
2004	Nevada	142.13	0.00
2004	New Hampshire	1,779.99	272.92
2004	New Jersey	171,186.19	1,180.25
2004	New Mexico	216.75	0.00
2004	New York	53,088.47	580.17
2004	North Carolina	401,012.57	32,849.91
2004	North Dakota	20.85	0.00
2004	Ohio	216,802.48	11,002.21
2004	Oklahoma	296,050.21	0.23
2004	Oregon	15,801.25	1.36
2004	Pennsylvania	55,331.00	18,890.37
2004	Puerto Rico	2.70	0.00
2004	Rhode Island	9.62	1.16
2004	South Carolina	126,502.44	2,388.17
2004	South Dakota	8.29	0.39
2004	Tennessee	91,659.01	1,933.85
2004	Texas	11,596.97	1,662.17
2004	Utah	6,030.53	0.30
2004	Vermont	5,071.54	222.16
2004	Virginia	23,051.34	635.79
2004	Washington	29,549.16	6,816.60
2004	West Virginia	34.84	0.76
2004	Wisconsin	7,485.49	87.49
2004	Wyoming	ND	ND
	Total:	**3,848,956.25**	**337,379.47**

ND = No Data Available

Table 10 shows that Barnwell in SC reported that Massachusetts generators shipped some 324.567 cubic feet of

LLRW totaling 1,398.049 curies in 2004 making the average concentration over 4.30 curie per cubic foot of waste. Envirocare in Clive, UT reported receiving some 175,415 cubic feet with 61.08 curies or 0.00035 curie per cubic foot.

3.2 Manifest Information Management System (MIMS)

The Manifest Information Management System (MIMS)[7] provides information on waste shipments to 3 commercial disposal facilities located in Barnwell, SC; Clive, UT; and Richland, WA. The Barnwell, SC site is operated by Chem-Nuclear Systems, the Clive, UT site is operated by Envirocare of Utah, and the Richland, WA site is operated by US Ecology Inc. The Richland, WA facility is located within United States Department of Energy's (USDOE) Hanford site near Richland, WA.

According to MIMS approximately 35.835 million cf of waste containing some 10.361 million curies of radioactivity were disposed from 1986 to 2003 at commercial disposal sites. The vast majority of the waste activity at 88.3%, came from nuclear facilities (utility), while only 27.1% came from waste volume. The Massachusetts figures are substantially different with utility shipping some 38.3 % of the activity and 95.5 % of the volume in 2004.

MIMS provides a comparison of the waste generated from Massachusetts waste generators as reported by the 3 commercial waste disposal sites and the DPH LLRW survey summary results using versions 1 and 2. All data is from four different data bases collected by three different agencies.

The DPH survey results from Table 10 (version 2) showed a total of 1,961.27 curies transferred while MIMS showed 1,830.24 curies transferred. DPH generator results for activity were 1.072 % of total as reported by disposal sites through MIMS. Results were within 7.2 % of each other showing consistency and accuracy which is 4 % higher than in 2003.

DPH survey results (version 2) showed a total of 225,200.93 cubic feet of waste transferred while MIMS showed 213,186.32 cubic feet transferred. DPH generator results for volume were 105.64 % of total as reported by disposal sites through MIMS. The percentage in 2003 was 363.92 %. Differences can not be readily explained although 2004 was much closer than in 2003. Possible explanations are:

1. LLRW is shipped to the generator's home office out-of-state and is combined with LLRW from other sites. This total is then reported to MIMS.

2. LLRW undergoes a degree of compaction or volume reduction[8]. One utility reports that its waste is shipped to a broker out-of-state where waste is segregated (free release) in order to reduce burial volume. The compaction method is by a glass melting process.

3. Generators estimating the volume of transferred LLRW. The actual volume is inflated by shipping container and packing which is later removed by broker.

4. Some waste held for convenience and deferred expenditures by broker or others, and sometimes for years.

5. Federal LLRW generators located in MA (example is US Food & Drug Administration) do not report to

[7] website is http://mims.apps.em.doe.gov

[8] Volume reduction refers to negative change in LLRW volume that occurs due to processing, either on or off site where waste was generated

MDPH on waste activities, but are reported by the waste disposal sites.

6. Some waste may be reported shipped during the reporting year, but arrived at the disposal facility after December 31st, thus being counted for the following year by the disposal site. Actually the waste should be reported as disposed in the year that it arrives at the disposal site, not the year it was transferred or shipped.

7. Some transferred waste reported is generated from only the current year (DPH version 1), while some transferred waste reported is generated from all previous years including current year (DPH version 2). These two versions mean a difference in billed amounts to the licensee especially the utility generators, and version 2 would result in a larger bill. The two versions are shown below in Table 10. Versions 1 and 2 are the same for storage.

DPH will stress in future surveys to report the volume in cf **actually transferred** to final disposal site.

TABLE 10

4 COMPARISONS OF LLRW TRANSFERRED FROM MASSACHUSETTS FOR 2004

	Richland, WA Database*	Barnwell, SC Database	Clive, UT Database	Totals From The Three Disposal Sites	MIMS Database	DPH Database (Version 1) as entered and shown in tables and graphs	DPH Database (Version 2) as adjusted for true comparisons here
Volume, CF	0.000	324.567	175,415	175,739.57	213,186.32	222,996.43	225,200.93
Activity, Curies	0.000	1,398.049	61.08	1,459.13	1,830.24	229.27	1,961.27

* Richland, WA site last received LLRW from MA generators in 1992.

TABLE 11		
MASSACHUSETTS 2004 WASTE GENERATOR CATEGORY RESULTS FROM MIMS		
Generator Class	**Volume Transferred (CF)**	**Activity Transferred (Curies)**
Academic	0.00(0.00%)	0.00 (0.00%**)**
Government	9.20 (0.00%)	0.18 (0.01%)
Industry	3,477.53 (1.63%)	60.29 (3.29%)
Medical	0.00 (0.00%)	0.00 (0.00%)
Utility	209,699.59 (98.37%)	1,769.77 (96.70%)
Totals	213,186.32 CF	1,830.24 Ci

TABLE 12
MA WASTE CLASSIFICATION AND GENERATOR CLASS FOR 2004 FROM MIMS

Disposal Site	Year Received	Generator Class	Total Volume(cf)	Total Activity (curies)	Class A Volume (cf)	Class B Volume (cf)	Class C Volume (cf)
Barnwell	2004	Academic	0.00	0.00	0.00	0.00	0.00
Barnwell	2004	Government	9.20	0.18	8.00	0.00	1.20
Barnwell	2004	Industry	0.00	0.00	0.00	0.00	0.00
Barnwell	2004	Medical	0.00	0.00	0.00	0.00	0.00
Barnwell	2004	Utility	756.59	1,768.83	22.5	421.02	313.07
Envirocare	2004	Government	0.00	0.00	0.00		
Envirocare	2004	Industry	3,477.53	60.29	3,477.53		
Envirocare	2004	Academic	0.00	0.00	0.00		
Envirocare	2004	Medical	0.00	0.00	0.00		
Envirocare	2004	Utility	208,943.00	0.94	208,943.00		
		Total:	213,186.32	1,830.24	212,451.03	421.02	314.27

MIMS reported that Barnwell received a total of 31 shipments (26 utility and 5 government), while Envirocare received a total of 310 (69 utility and 241 industry) shipments from Massachusetts generators in 2004.

3.3 National Regulatory History For LLRW

1980's

In 1980, the U.S. Congress passed the Low-Level Radioactive Waste Policy Act (P.L. 96-573).

The Act established three major policies:

1. Each state is responsible for the LLRW generated within its boundaries.

2. States may form compacts (or groups of states) to facilitate managing LLRW generated within the boundaries of the compact states.

3. Compacts could not refuse waste from other states until U.S. Congress had ratified the compact.

On 1/1/1986 the Low Level Radioactive Waste Policy Amendments Act (P.L.99-240) was signed into law, making a generator's continued access to the three operating disposal sites contingent on its compact meeting

specified milestones for new site development. The amended Act clarified Congress intent to require compacts (or individual states not within a compact) to provide disposal capacity for LLRW generated within its boundaries by 1/1/1993.

The chief mandate of these federal statues requires each state to provide for its LLRW disposal by 1/1/1996. If a state fails to do this by this date, it must assume ownership and liability for all LLRW produced within its borders after 1996.

In response to these federal laws, Massachusetts enacted MGL Chapter 111 H in 1987. This 48 section general law as amended in 2002 authorizes the DPH to regulate the management of low level radioactive waste in the Commonwealth. Complete copies of the general law are available on state web site at

http://www.mass.gov/legis/laws/mgl/gl-111h-toc.htm

Effective 6/26/1986 in response to the Low Level Radioactive Waste Policy Amendments Act, the State of Rhode Island created a Rhode Island-Massachusetts Interstate Low-Level Radioactive Waste Management Compact called Title 23 Health and Safety Chapter 23-19.9 Low-Level Radioactive Waste Compact. However, neither Massachusetts nor any other state ever approved or joined the compact. More information is available at the following State of Rhode Island link:

http://www.rilin.state.ri.us/Statutes/TITLE23/23-19.9/INDEX.HTM

1990's

In early 1990's the 9 member Massachusetts Low Level Radioactive Waste Management Board (Athe board@) was established to manage LLRW in Massachusetts and to investigate whether a LLRW disposal site would be located in Massachusetts. In March of 1996 after a thorough investigation, the Board voted **not** to locate a LLRW disposal site in Massachusetts as three out-of-state disposal sites (SC, WA, and UT) were available to Massachusetts generators.

Present

In fall of 2002 the Board was abolished by the Legislature and its powers and duties were transferred to DPH. Massachusetts remains an unaffiliated state and is not a member of any of the ten state LLRW compacts. The other unaffiliated states are: District of Columbia, Maine, Michigan, Nebraska, New Hampshire, New York, North Carolina, Puerto Rico, and Rhode Island.

Figure 1 is map of USA showing Low Level Radioactive Disposal Compact Membership by states and including District of Columbia and Puerto Rico. Membership changes do occur, and Maine recently left the Texas Compact.

Future

Barnwell, SC accepts LLRW through brokers or processors or directly from LLRW generators, only until June 30, 2008 as its disposal capacity has almost been reached. After 2008 they will only accept LLRW from Atlantic Compact members (formerly the Northeast Compact) consisting of states of SC, CT, and NJ. There is no immediate crisis to Massachusetts generators as small amounts of class B and C wastes may be stored on site. However, a solution must be found for the disposal of these classes of waste. If Massachusetts were to consider joining the Atlantic Compact, it would be required to become a host state. The Board had rejected that idea back in 1996**.**

Clive, Utah is accepting LLRW Class A including HVLA waste from all states except the 8 states in the Northwest Compact. They do not accept Class B or C wastes from any states.

Richland, WA is not accepting any Class A, B, C, or HVLA LLRW wastes, but will accept NARM and NORM wastes which are not considered LLRW wastes from all 50 states. Richland, WA only serves the Rocky Mountain and Northwest Compact members consisting of 11 states.

Texas has recently passed legislation to allow creation of two privately run LLRW disposal facilities to be licensed as one site by the state. On December 29, 2003 Texas opened up the process to accept applications from July 8-August 6, 2004 from any interested parties to license a LLRW disposal site. One site may dispose of federal facility waste and the other may dispose of commercial low-level radioactive waste. Texas is host state to the Texas Compact of which VT is a member, and Maine formally withdrew in April of 2004.

The Executive Director of the Texas Commission on Environmental Quality (TCEQ) directed staff to conduct a Technical Review on the application submitted on August 4, 2004 by Waste Control Specialists, LLC (WCS) for license authorization for the near-surface disposal of low-level radioactive waste at the company's site in Andrews County, Texas which is near the NM border.

After the technical review of WCS' application is completed, a Notice of the Completion of Technical Review will be published and distributed. It is available on the internet at:

http://www.tceq.state.tx.us/permitting/waste_permits/rad_waste/wcs_license_app.html

New membership cost is a minimum of $25 million dollars. Massachusetts is currently considering its options.

Chapter 428 of the MA Acts of 1993 was approved on January 11, 1994 and states in part:

The state treasurer, upon request of the Governor, may issue and sell bonds up to 45 million dollars for a maximum term of 20 years for the purpose of siting LLRW storage, treatment, or disposal facilities. This bond authorization which expires in 2018 could be used to join a compact.

New generator's fees called reimbursement surcharges would be needed to retire the Commonwealth's bonds including interest charges.

This Low Level Radioactive Waste Bond Authorization was originally filed as House Bill no. 5655 in 1993 regular session. A complete copy of the Act is available at: Commonwealth of MA State Library 442 State House Boston, MA 02133 or by an e-mail request to: reference.department@state.ma.us

A solution must be identified by July 1, 2008 or Massachusetts and 35 other state generators will have no treatment option other than decay on site unless Texas opens a new LLRW site for Class B and C wastes.

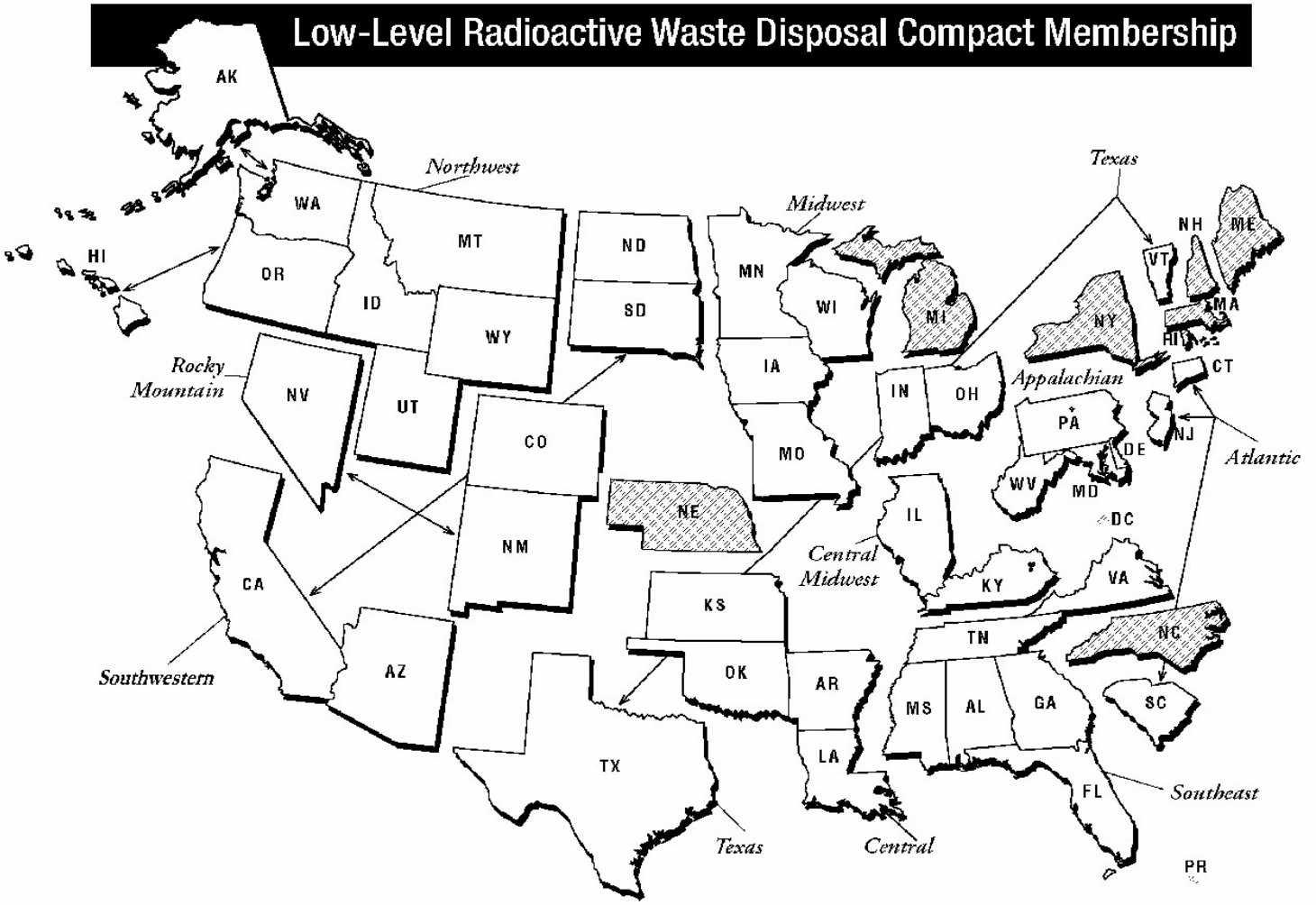
3.4 INTERREGIONAL COOPERATION

DPH continues to participate in the Low-Level Radioactive Waste Forum, Inc. (LLW Forum). Their informative web site which includes useful links is www.llwforum.org

The LLW Forum is a national association of representatives of compacts[9], host states, unaffiliated states, and states with currently operating disposal facilities and established to facilitate the implementation of the 1985 Low-Level Radioactive Waste Policy Amendments Act. The LLW Forum provides an opportunity for states and compacts to share information and exchange views with officials of federal agencies and other interested parties. LLW Forum participants also serve as liaisons to other entities, including the Conference of Radiation Control Program Directors, the Conference of State Legislatures, and the federal Facility Compliance Act Task Force. MA is represented on the LLW Forum by Mr. Robert Walker and Mr. Frederick Barker.

[9]Compact is a formal agreement between two or more states under Article 1, Section 10 of the US Constitution, states may form compacts with the consent of Congress to resolve conflicts or address common problems. More than 120 such compacts have focused on various subjects, including water, education, transportation, fisheries, health, and waste.

FIGURE 1



Appalachian Compact
Delaware
Maryland
Pennsylvania
West Virginia

Atlantic Compact
Connecticut
New Jersey
South Carolina

Central Compact
Arkansas
Kansas
Louisiana
Oklahoma

Central Midwest Compact
Illinois
Kentucky

Northwest Compact
Alaska
Hawaii
Idaho
Montana
Oregon
Utah
Washington
Wyoming

Midwest Compact
Indiana
Iowa
Minnesota
Missouri
Ohio
Wisconsin

Rocky Mountain Compact
Colorado
Nevada
New Mexico

Nothwest accepts Rocky Mountain waste as agreed between compacts

Southeast Compact
Alabama
Florida
Georgia
Mississippi
Tennessee
Virginia

Southwestern Compact
Arizona
California
North Dakota
South Dakota

Texas Compact
Texas
Vermont

Unaffiliated States
District of Columbia
Maine
Massachusetts
Michigan
Nebraska
New Hampshire
New York
North Carolina
Puerto Rico
Rhode Island

Chapter 4

Financial Data

4.1 Financing LLRW Management

In October of 2002 the Board was dissolved, and its remaining funds were transferred to DPH.

Funds to manage the requirements of MGL Ch 111H as amended including the annual survey come from an assessment on radioactive material users and LLRW generators pursuant to MGL Chapter 111H sections 4A and 4B. A total of 492 users were assessed $162,805.00 starting in April of 2005 (using the same rates[10] as the Board last used in 2001) for period of calendar year 2004. This is a decrease from 503 users assessed in 2003. Ten facilities were unresponsive and did not submit the survey form. Some could not be found, and some are in process of having their licenses terminated.

In calendar year 2004 and as of 12/31/04, DPH had collected over $160,000 in LLRW assessments for preceding year using the state MMARS billing system. These fees are deposited into the state LLRW rebate trust fund. Any unpaid assessments are charged interest at 12% per annum on and after the due date which is 90 days from the invoice date. After 180 days any outstanding fee users are issued a collection letter and subject to intercept of any state payments or tax refunds and referral to collection.

The billed amounts range from the regulatory minimum of $75.00 to a maximum of $55,199.71 per licensee.

Cities and towns are exempt from the annual LLRW fees per MGL Chapter 29, section 27 C, but must still submit the annual LLRW survey when requested. Eleven municipal licensees are in this category.

One waste generator is in bankruptcy and owes the Commonwealth over $82,500 in past fees.

The flat assessment charged to all licensees and registrants is $75.00 per year and remains unchanged. In addition, a proportional assessment of $1.96 per cubic foot of the weighted volume is calculated for some licensees or registrants pursuant to 345 CMR 4.03 (2) (c) 3 and an additional assessment of $0.20 per cubic foot of the weighted volume of high volume, low activity waste is calculated for some licensees or registrants pursuant to 345 CMR 4.03 (2) (c) 4.

The total LLRW annual fee charged is based on billing formula below:

$ LLRW ANNUAL FEE = $75.00 + (CRF (PF) (CA + 3CB +5CC)) + ((HVLA (0.1) (PF))

PF is proportional fee or proportional assessment currently set at $1.96 per cubic foot of waste. The PF figure formerly was much higher and has been decreasing over time. The PF amount and $75.00 minimum amount

[10] According to FY 1997 Board's annual report, a total of 534 radioactive materials users and LLRW generators were assessed $275,872.63 during fiscal year 1997.

remain unchanged since 2001.

CRF is classification radioactivity factor varying between 1.0 - 1.3 as shown in **Table 13**.

CA = Class A LLRW waste volume in cubic feet

CB = Class B LLRW waste volume in cubic feet

CC = Class C LLRW waste volume in cubic feet

PF = Proportional assessment set at $1.96 per cubic feet of weighted volume of waste per DPH

HVLA = HVLA waste volume in cubic feet

Table 13	
Classification of Radioactivity Factor (CRF) 345 CMR Table 4.03 B	
Radioactivity of Waste Shipped for Disposal Off Site or Stored for Later Disposal	**Classification of Radioactivity Factor (CRF)**
less than 1.0 curie per year	1.0
1.0 curie per year or more, but less than 10.0 curies per year	1.1
10.0 curies per year or more, but less than 100.0 curies per year	1.2
100.0 curies per year or more	1.3

In summary the billing invoice amount is a function of volume, class, and activity of waste generated per year with all licensees (except cities and towns) paying a $75.00 minimum LLRW fee. The higher the volume and activity and class of LLRW generated, the higher the annual fee payable.

4.2 DOE FUNDING

No funds from US Department of Energy (DOE) were received in 2004 pursuant to the federal Low-Level Radioactive Waste Policy Act, as amended (P.L. 99-240). These funds were collected by certain LLRW disposal sites as a surcharge to use these disposal sites. The funds are held by DOE, and rebated to various states based upon their success in meeting milestones outlined in federal law. Since Massachusetts ceased its disposal siting activities in 1996 and remains an unaffiliated disposal state, no funds were received in 2004.

APPENDIX A

FIGURE 2

PERCENT OF TOTAL ACTIVITY BY WASTE CLASS FOR 2004

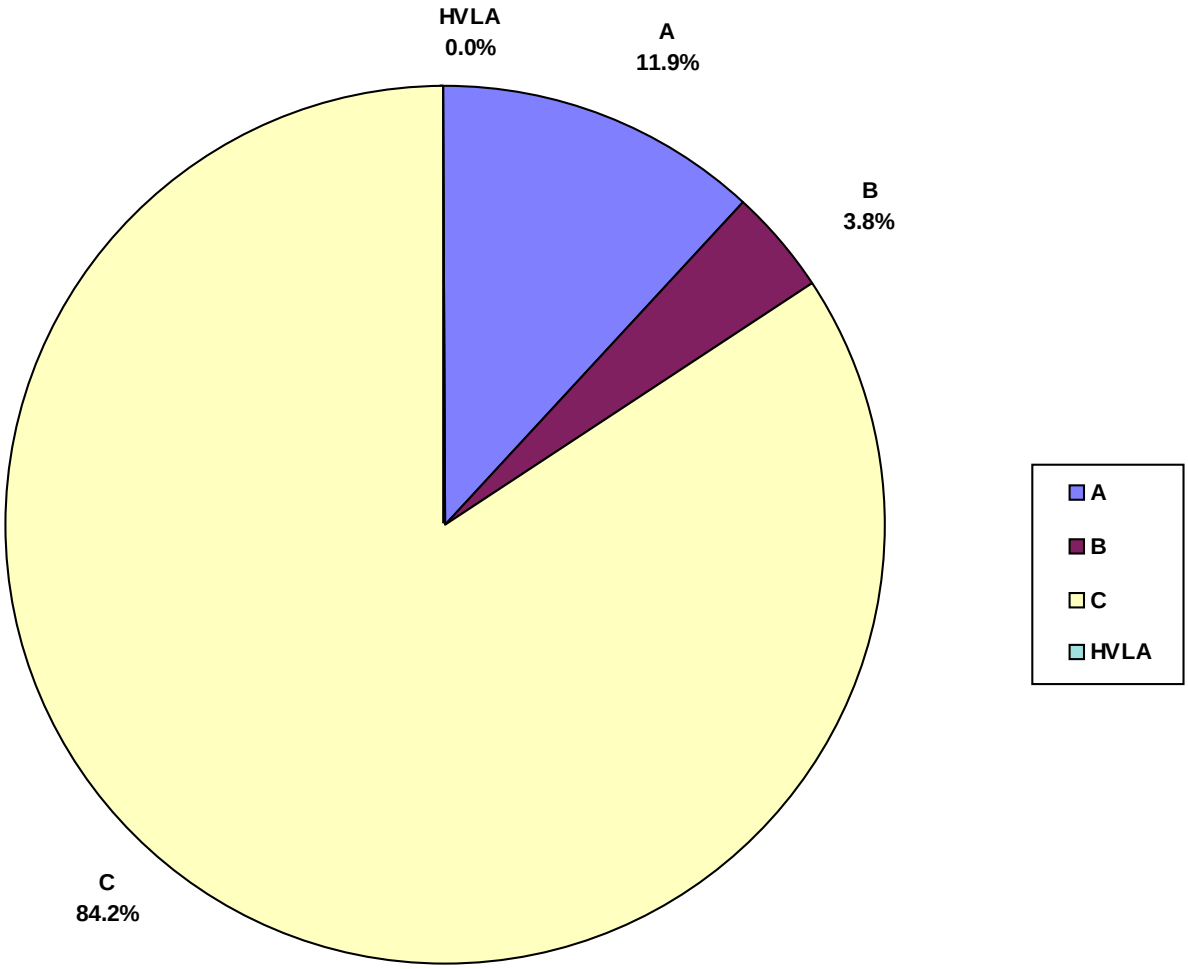


FIGURE 3

PERCENT ACTIVITY PLACED IN STORAGE BY WASTE CLASS FOR 2004

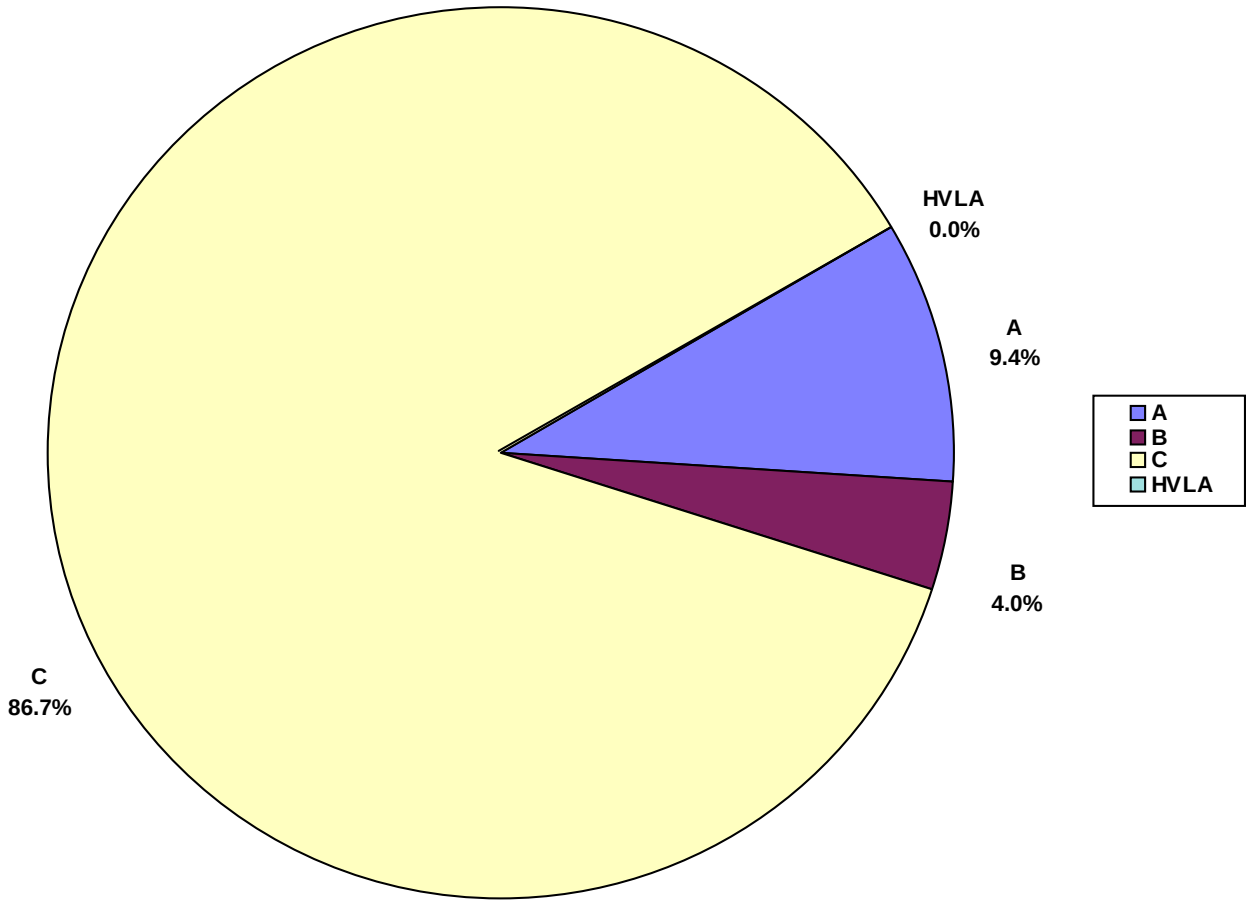


FIGURE 4

PERCENT ACTIVITY TRANSFERRED BY WASTE CLASS FOR 2004

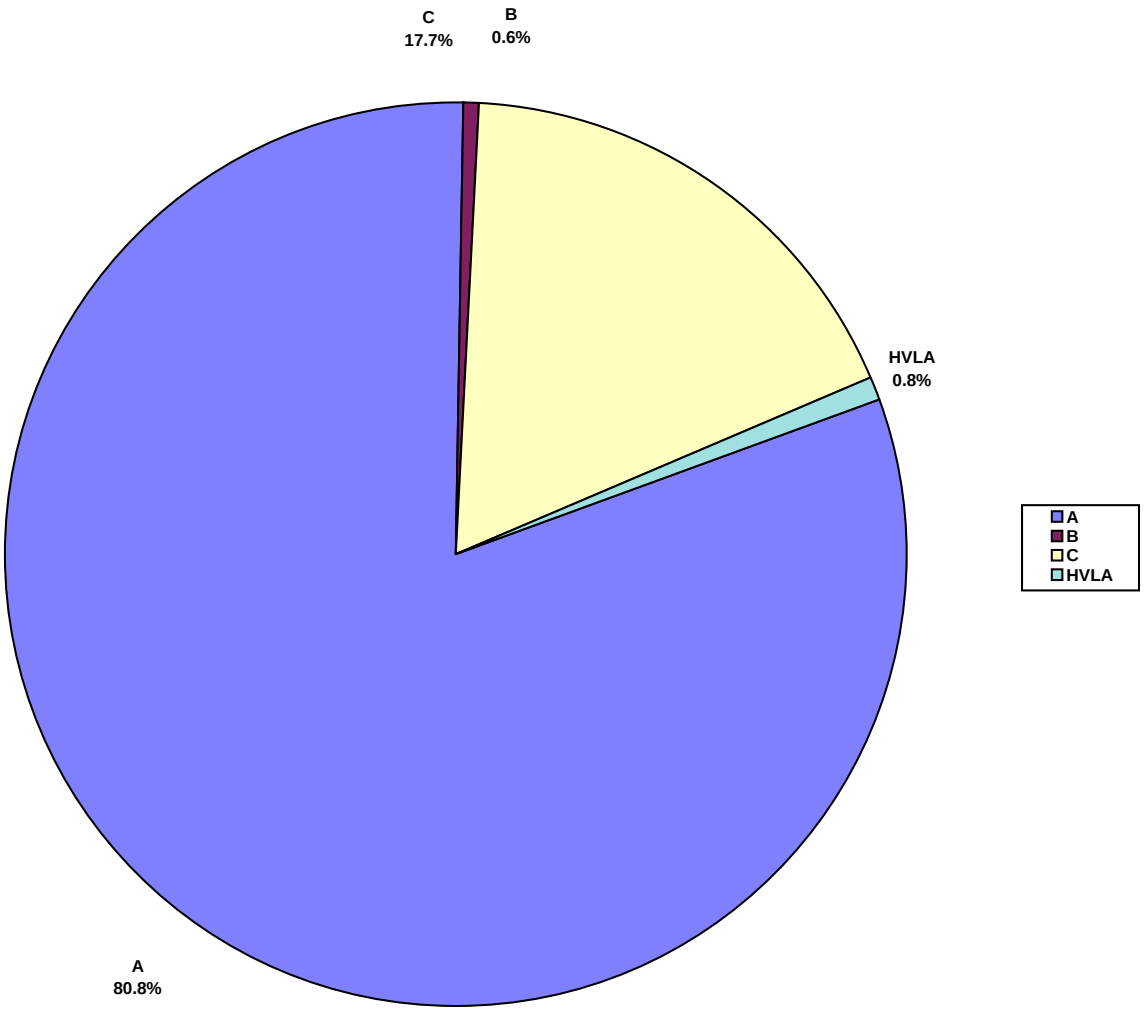


FIGURE 5

PERCENT TOTAL VOLUME BY WASTE CLASS FOR 2004

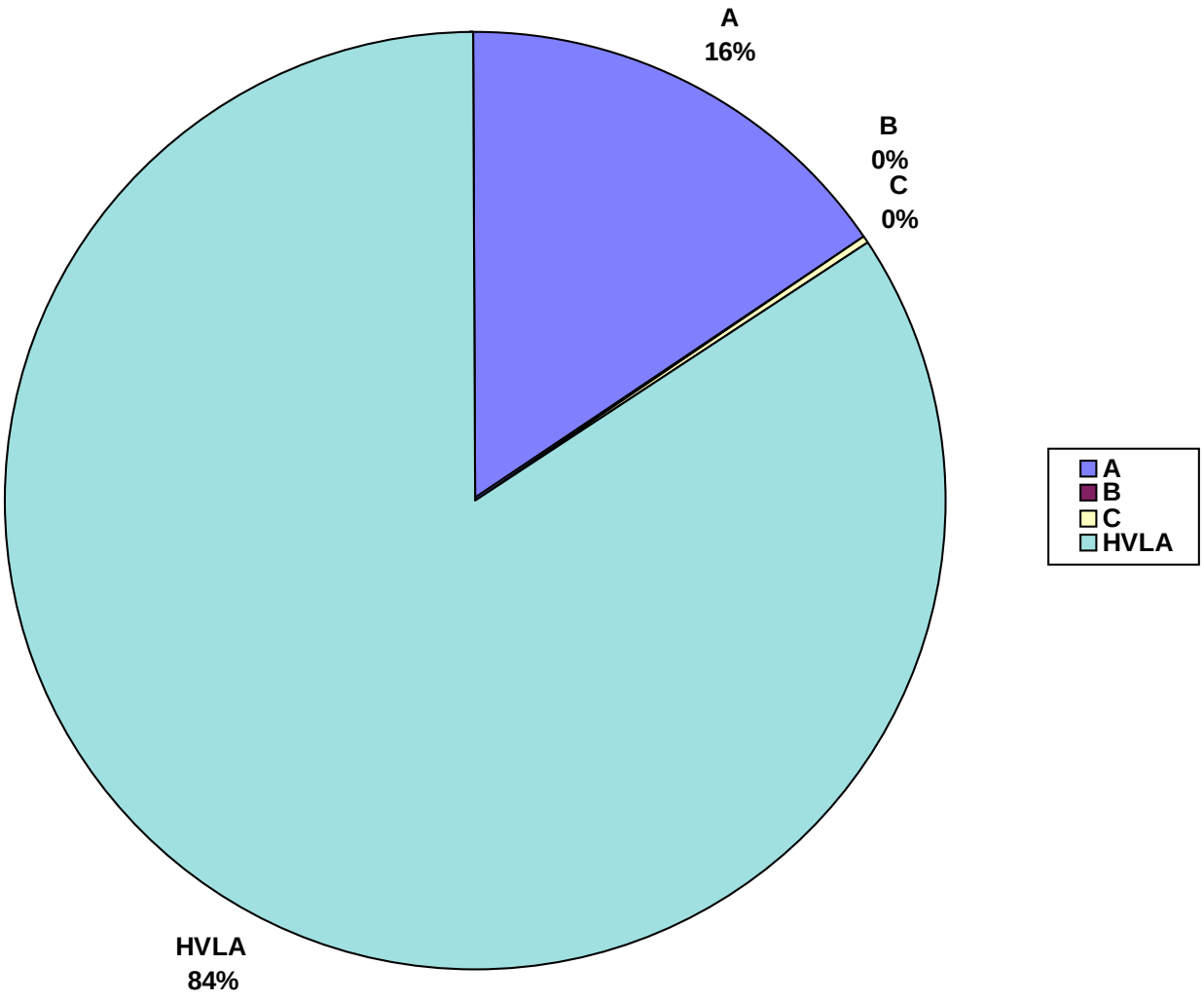


FIGURE 6

PERCENT VOLUME IN STORAGE BY WASTE CLASS FOR 2004

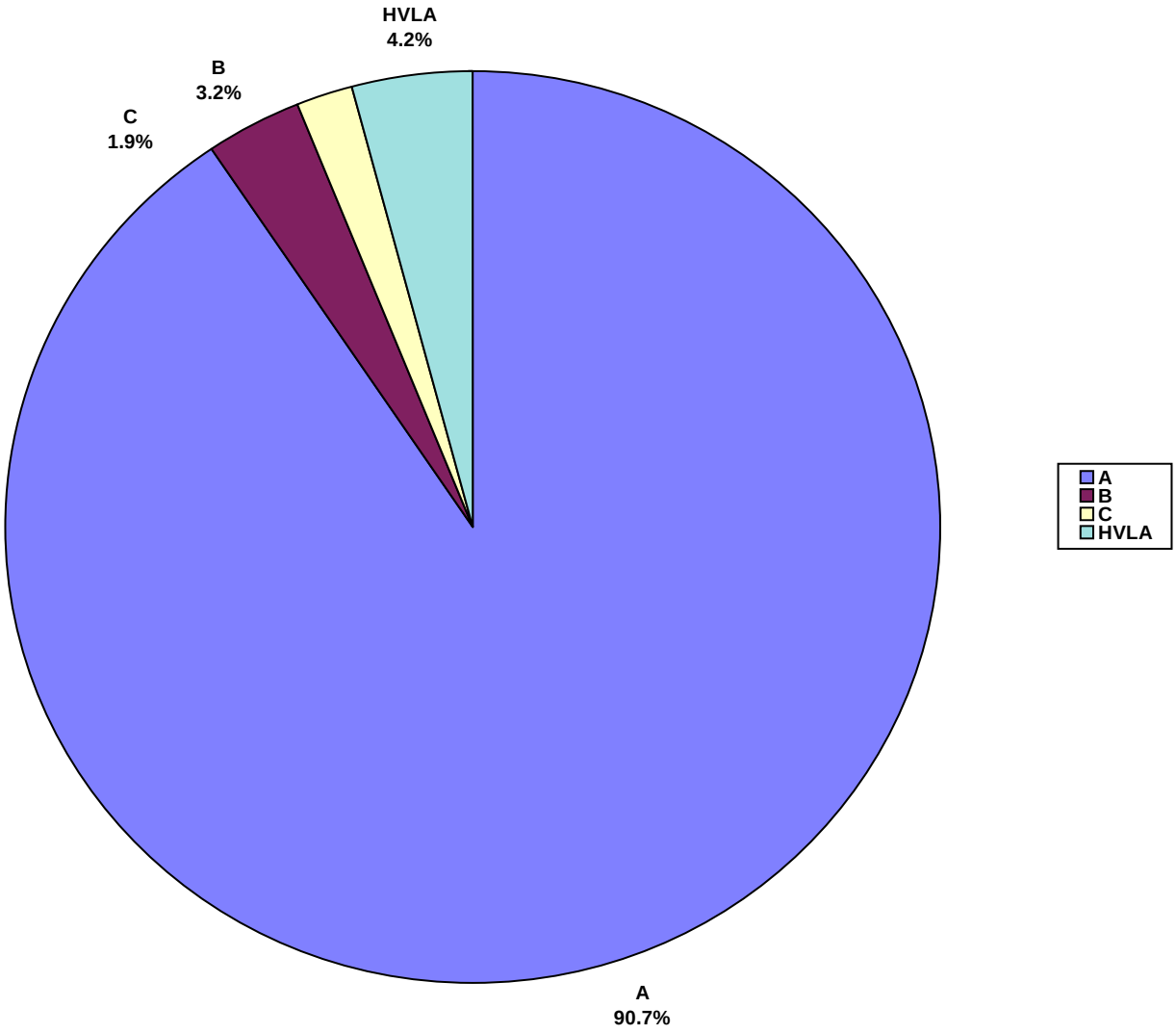


FIGURE 7

PERCENT VOLUME SHIPPED BY WASTE CLASS FOR 2004

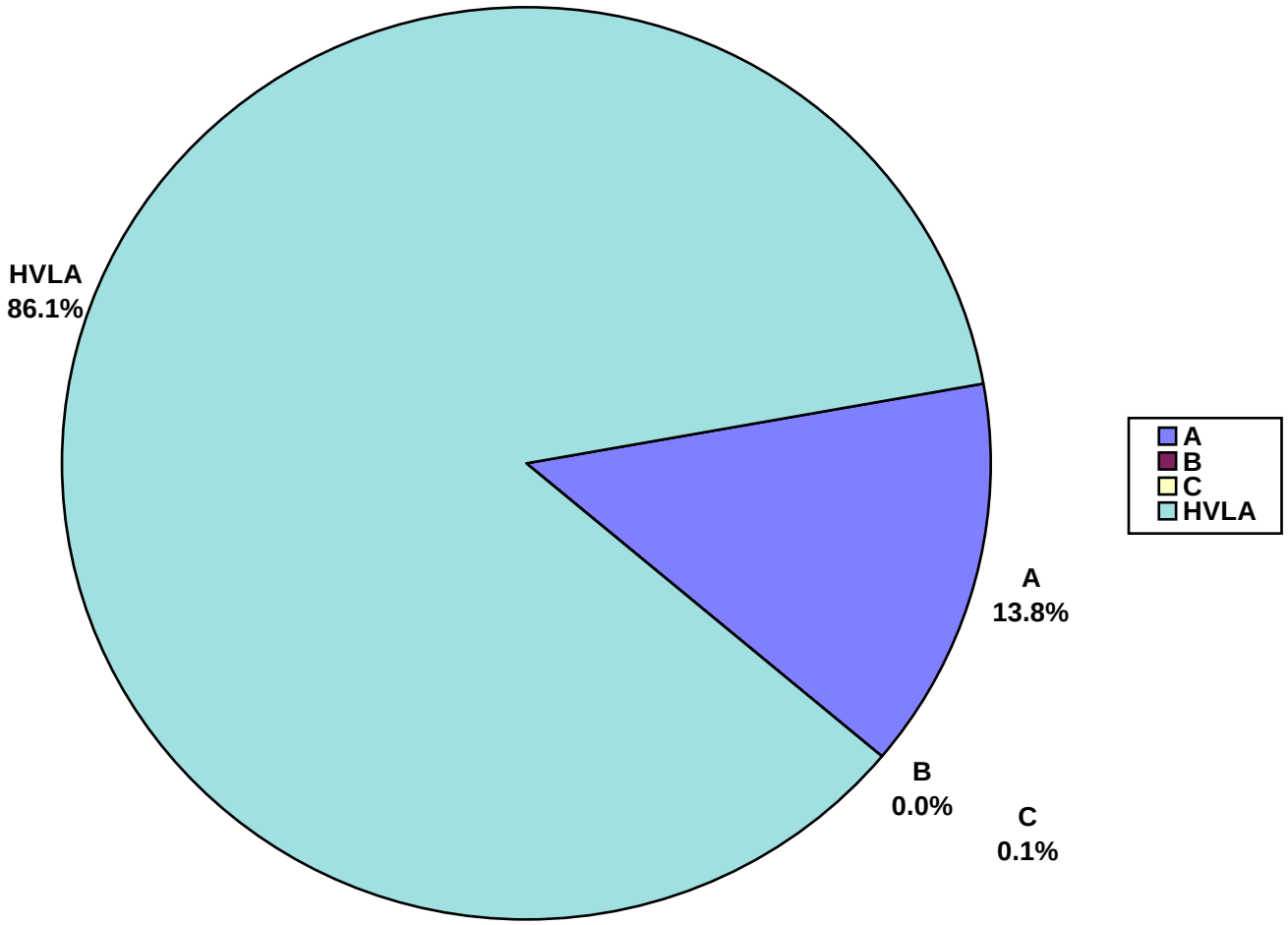
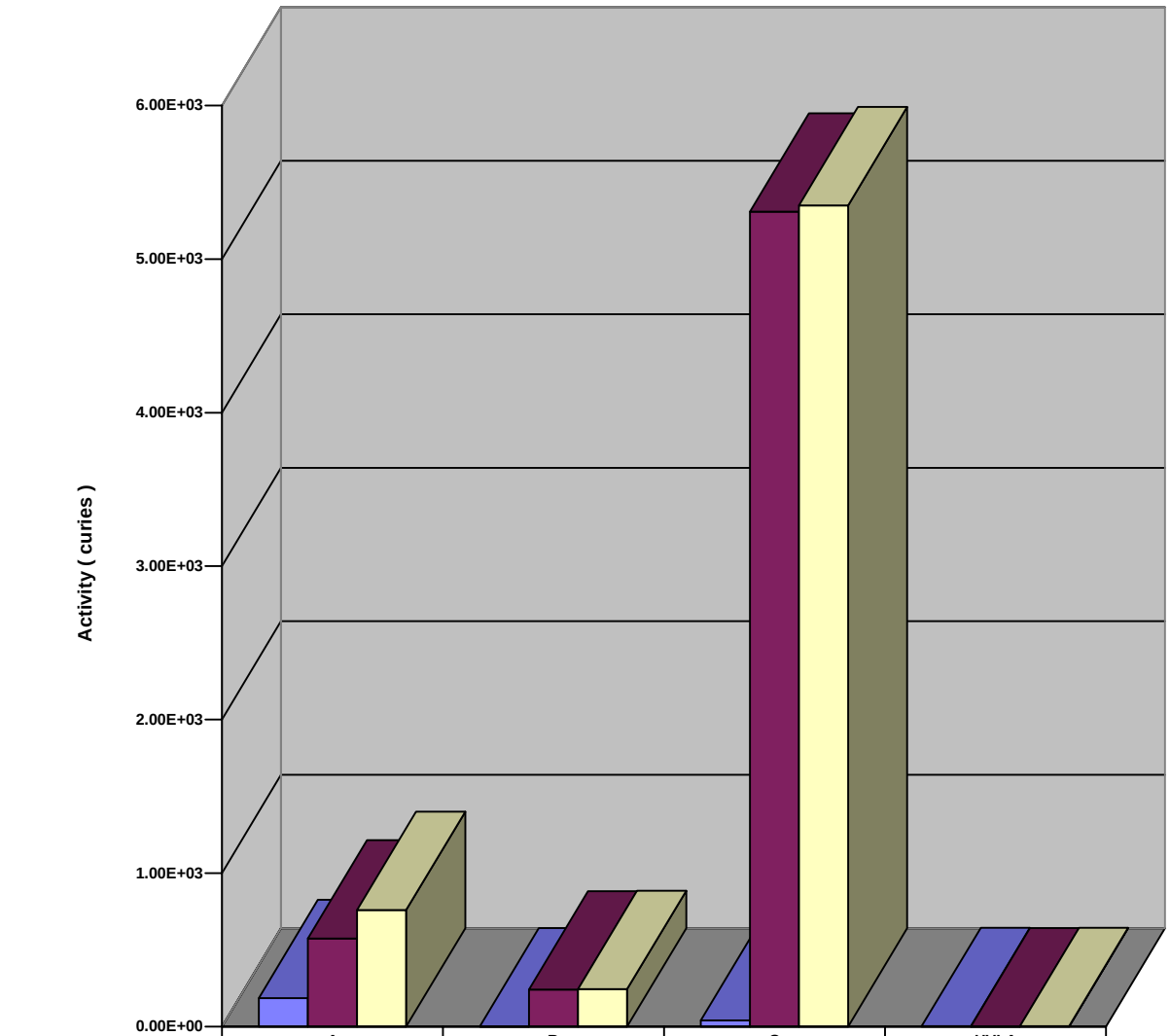


FIGURE 8

COMPARISON OF WASTE ACTIVITIES BY WASTE CLASS FOR 2004

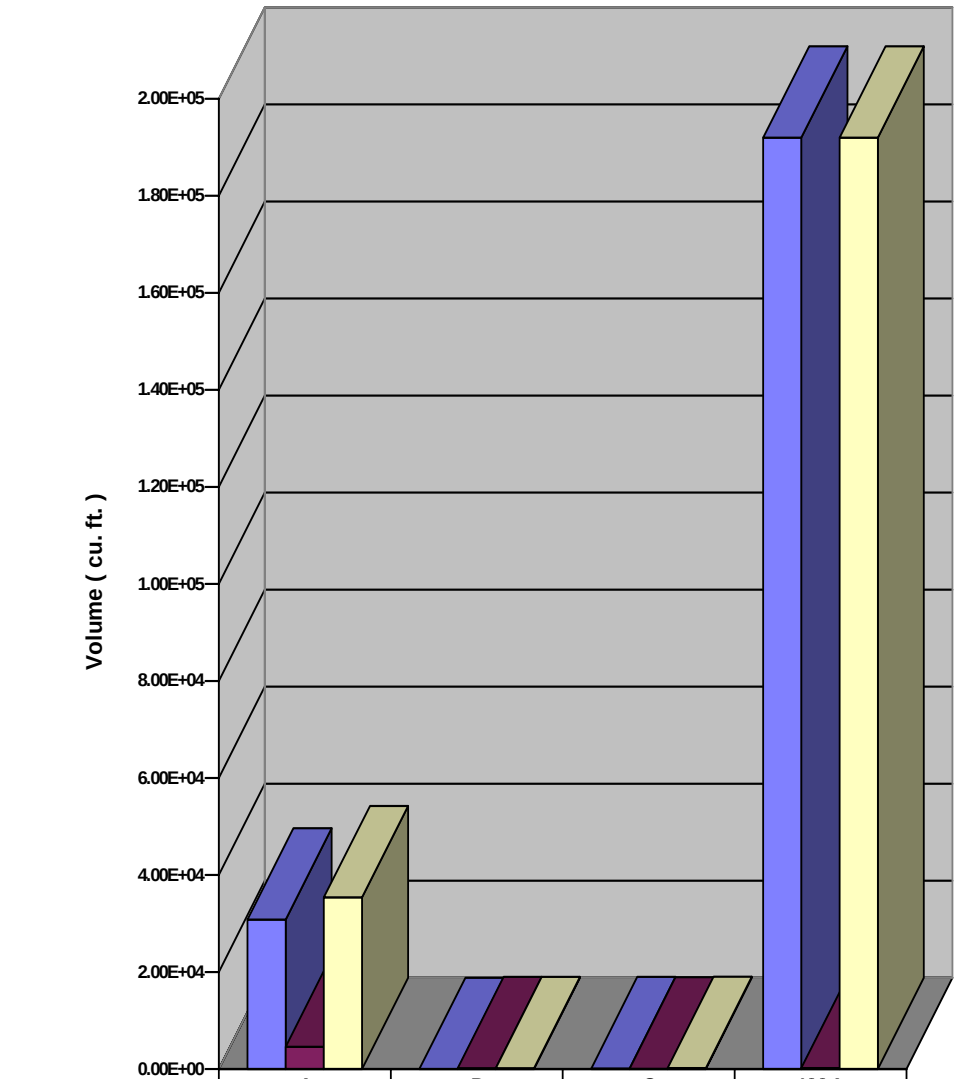


	A	B	C	HVLA
Activity Transferred	1.85E+02	1.45E+00	4.06E+01	1.86E+00
Activity Placed In Storage	5.73E+02	2.42E+02	5.31E+03	1.32E-01
Activity Total	7.59E+02	2.44E+02	5.35E+03	1.99E+00

Waste Class

FIGURE 9

COMPARISON OF WASTE VOLUMES BY WASTE CLASS FOR 2004



	A	B	C	HVLA
Volume Transferred	3.08E+04	3.41E+00	1.50E+02	1.92E+05
Volume Placed In Storage	4.61E+03	1.62E+02	9.65E+01	2.15E+02
Volume Total	3.54E+04	1.65E+02	2.46E+02	1.92E+05

Waste Class

FIGURE 10

PERCENT OF TOTAL ACTIVITY BY WASTE GENERATOR CATEGORY FOR 2004

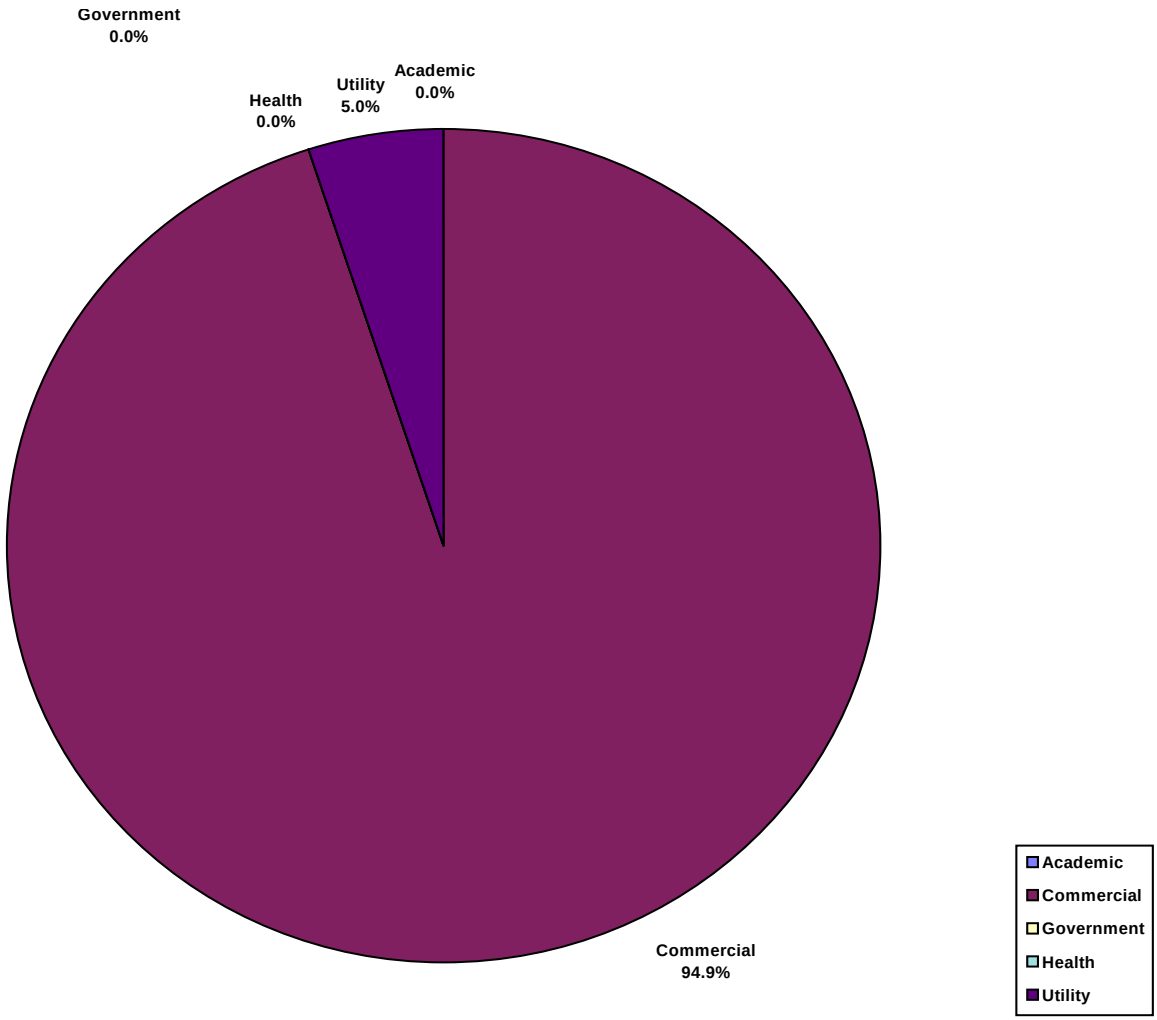


FIGURE 11

PERCENT OF IN - STORAGE ACTIVITY BY WASTE GENERATOR CATEGORY FOR 2004

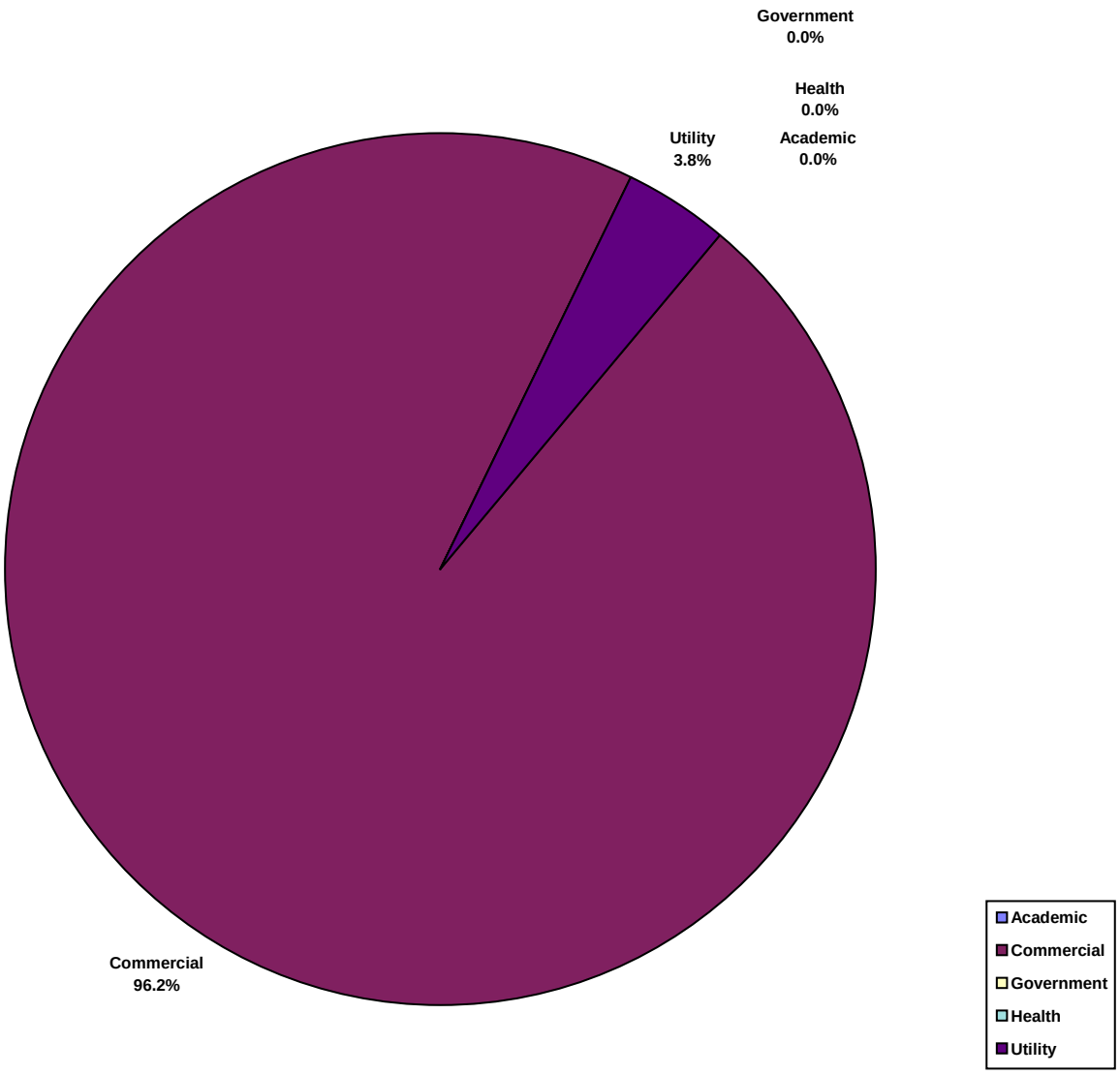


FIGURE 12

PERCENT OF TRANSFERRED ACTIVITY BY WASTE GENERATOR CATEGORY FOR 2004

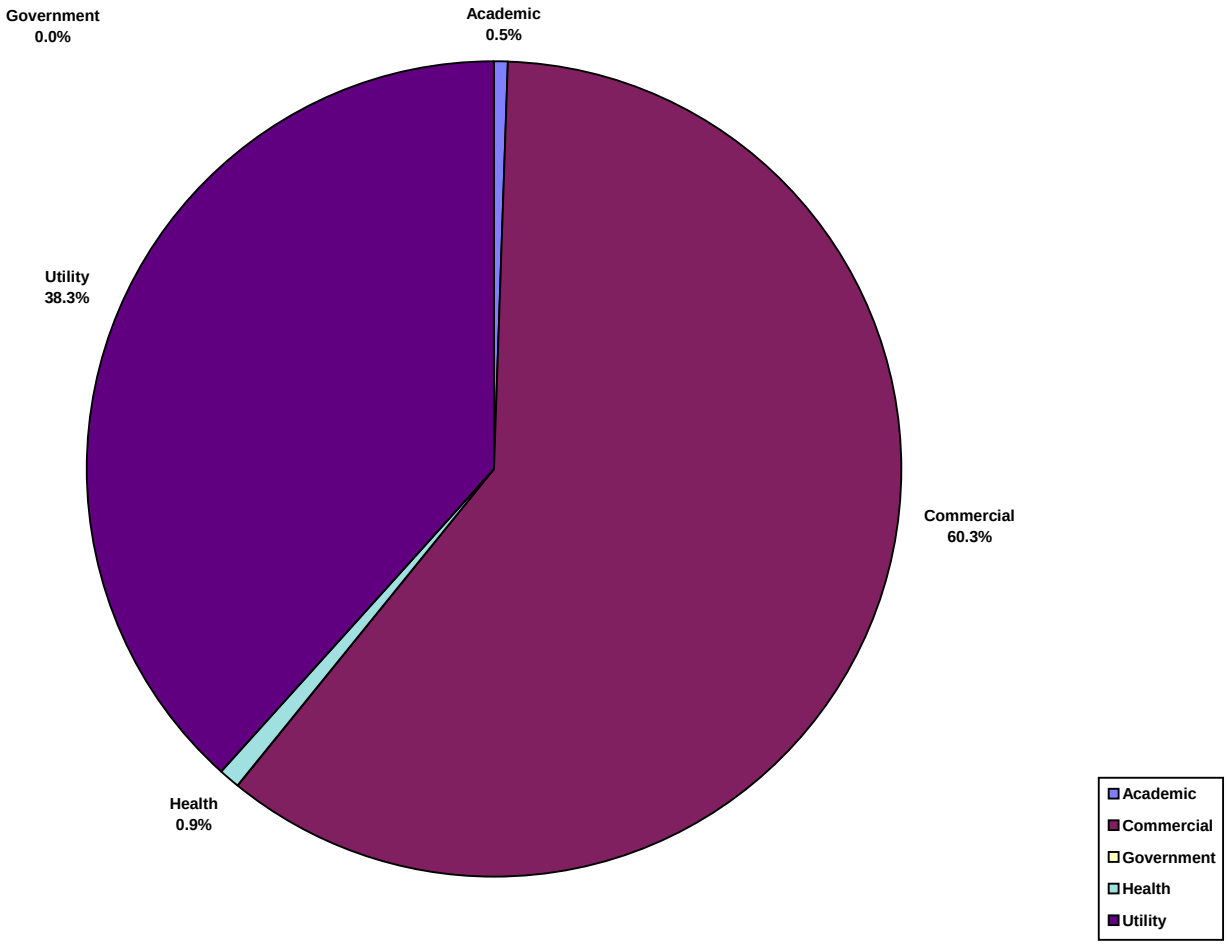
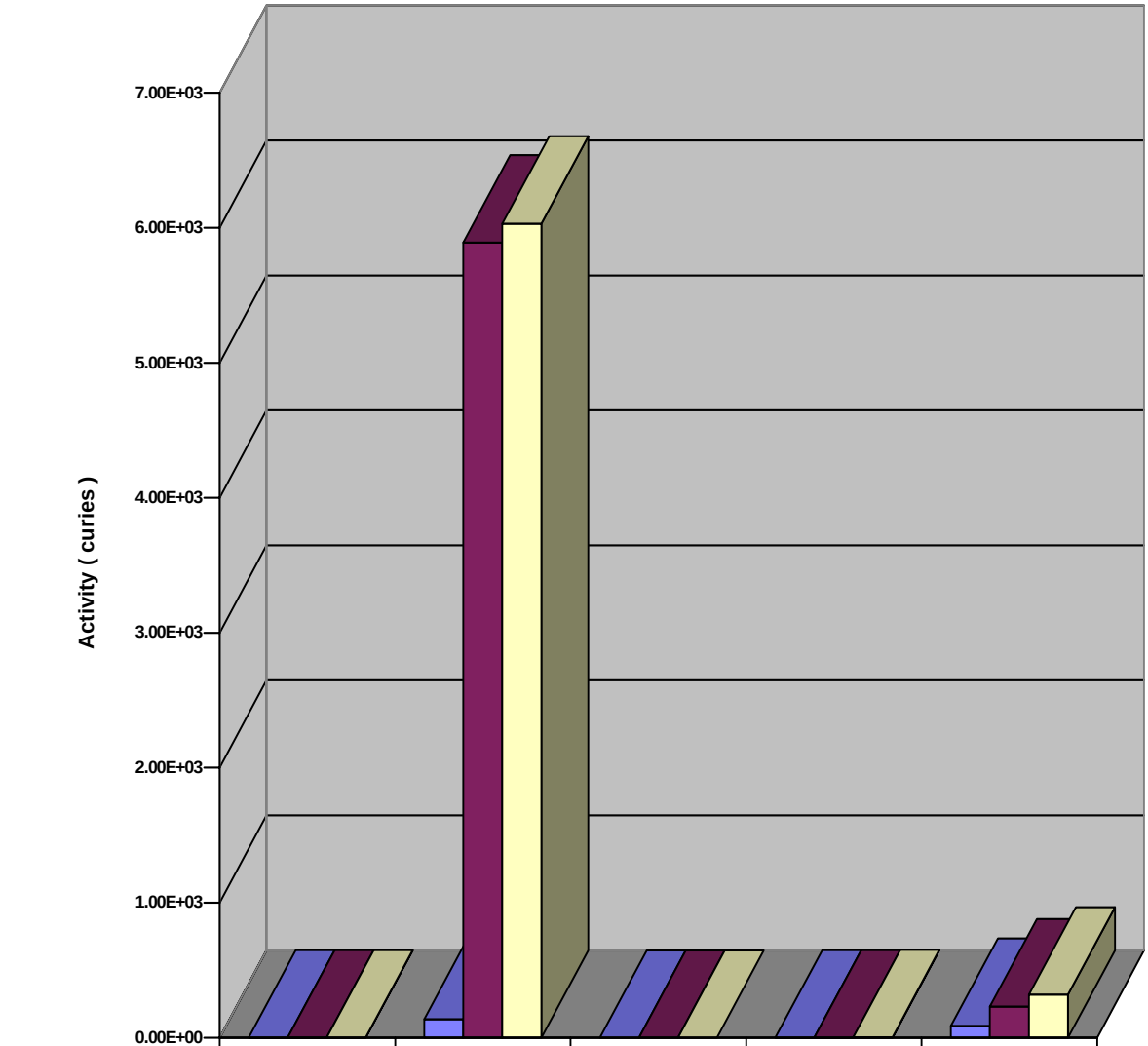


FIGURE 13

COMPARISON OF WASTE ACTIVITIES BY WASTE GENERATOR CATEGORY FOR 2004



	Academic	Commercial	Government	Health	Utility
Activity Transferred	1.22E+00	1.38E+02	1.28E-02	2.10E+00	8.78E+01
Activity Placed In Storage	8.17E-01	5.89E+03	0.00E+00	3.78E-01	2.32E+02
Activity Total	2.03E+00	6.03E+03	1.28E-02	2.48E+00	3.20E+02

FIGURE 14

PERCENT OF TOTAL VOLUME BY WASTE GENERATOR CATEGORY FOR 2004

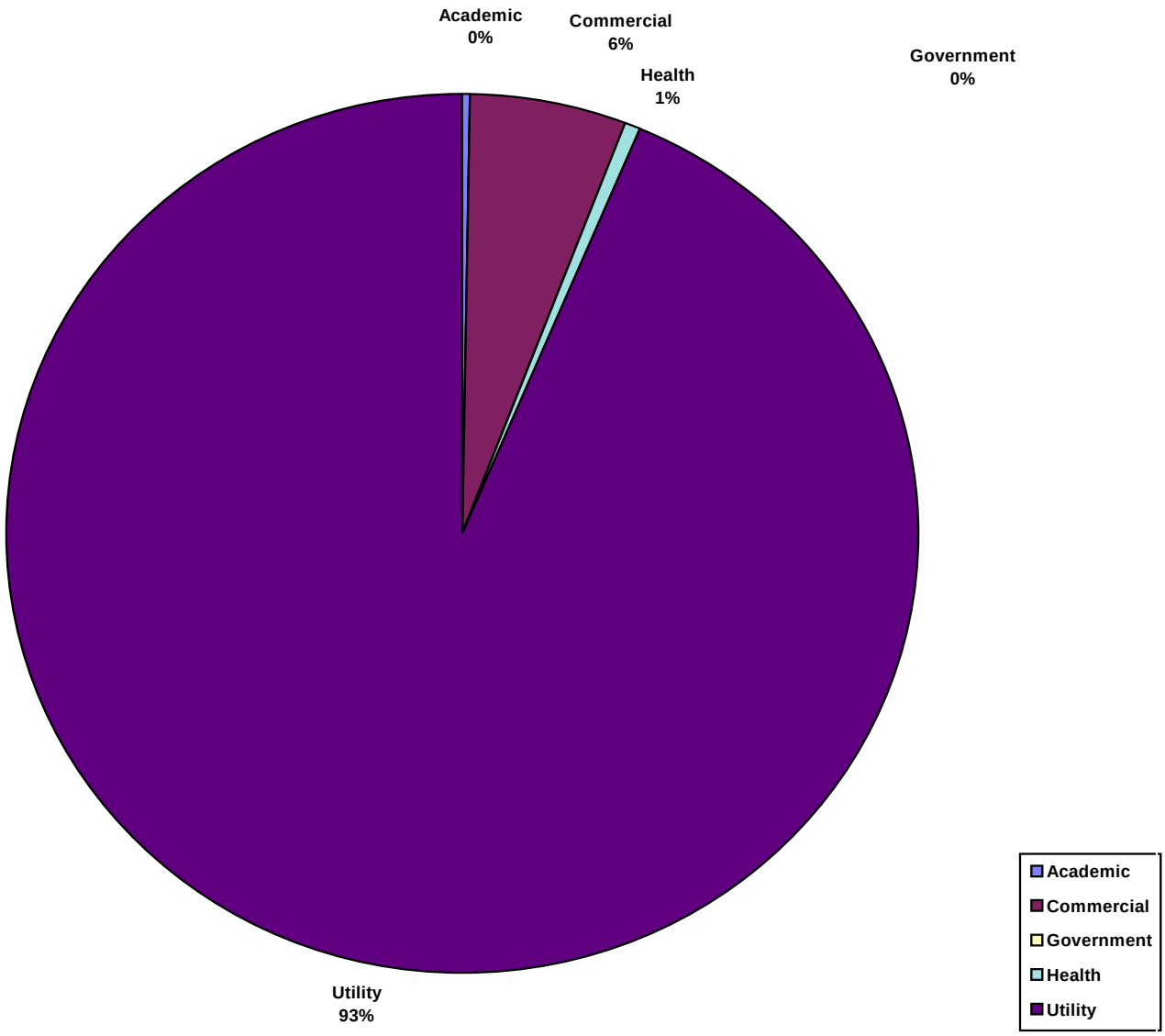


FIGURE 15

PERCENT OF IN-STORAGE VOLUME BY WASTE GENERATOR CATEGORY FOR 2004

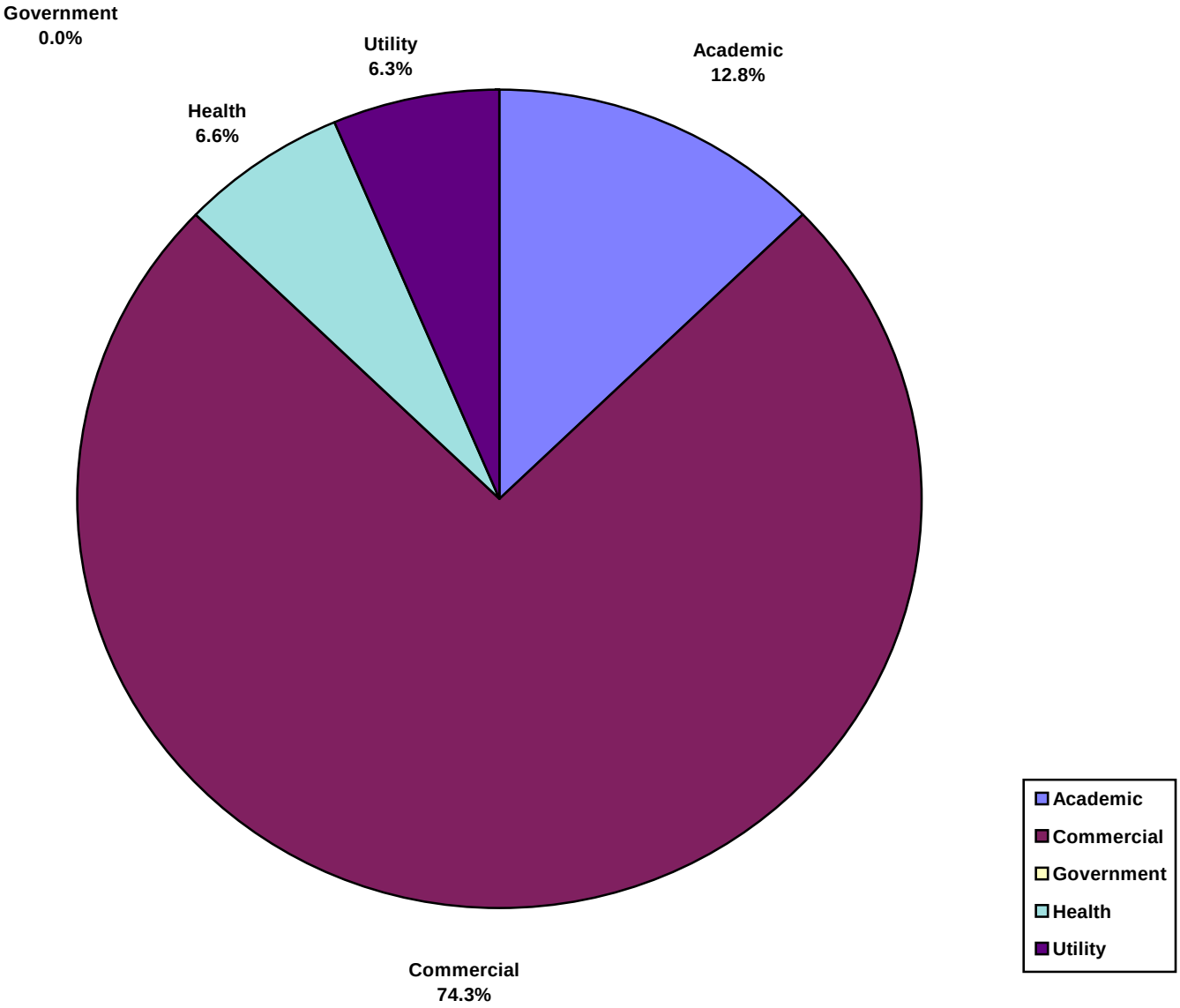


FIGURE 16

PERCENT OF TRANSFERRED VOLUME BY WASTE GENERATOR CATEGORY FOR 2004

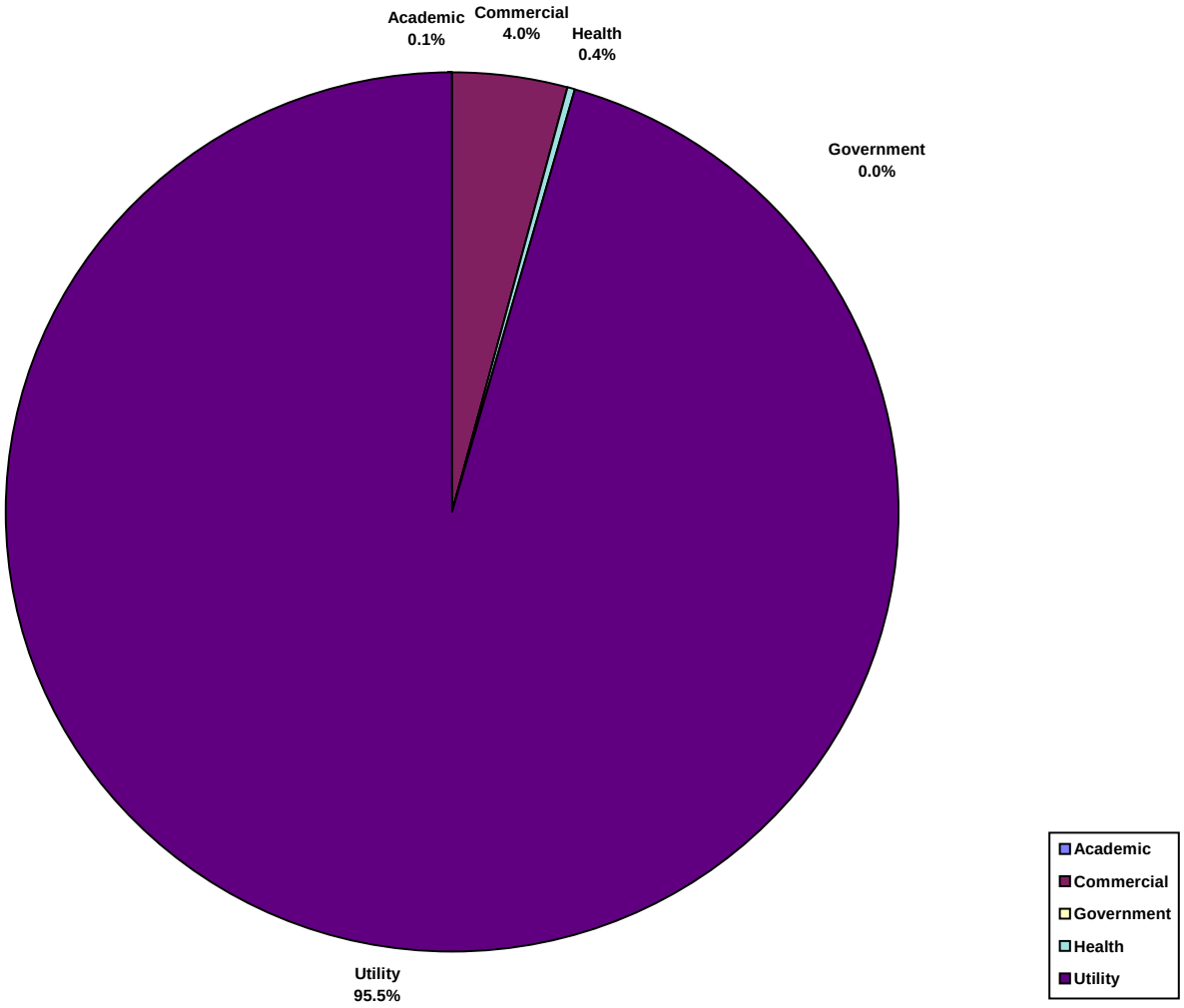
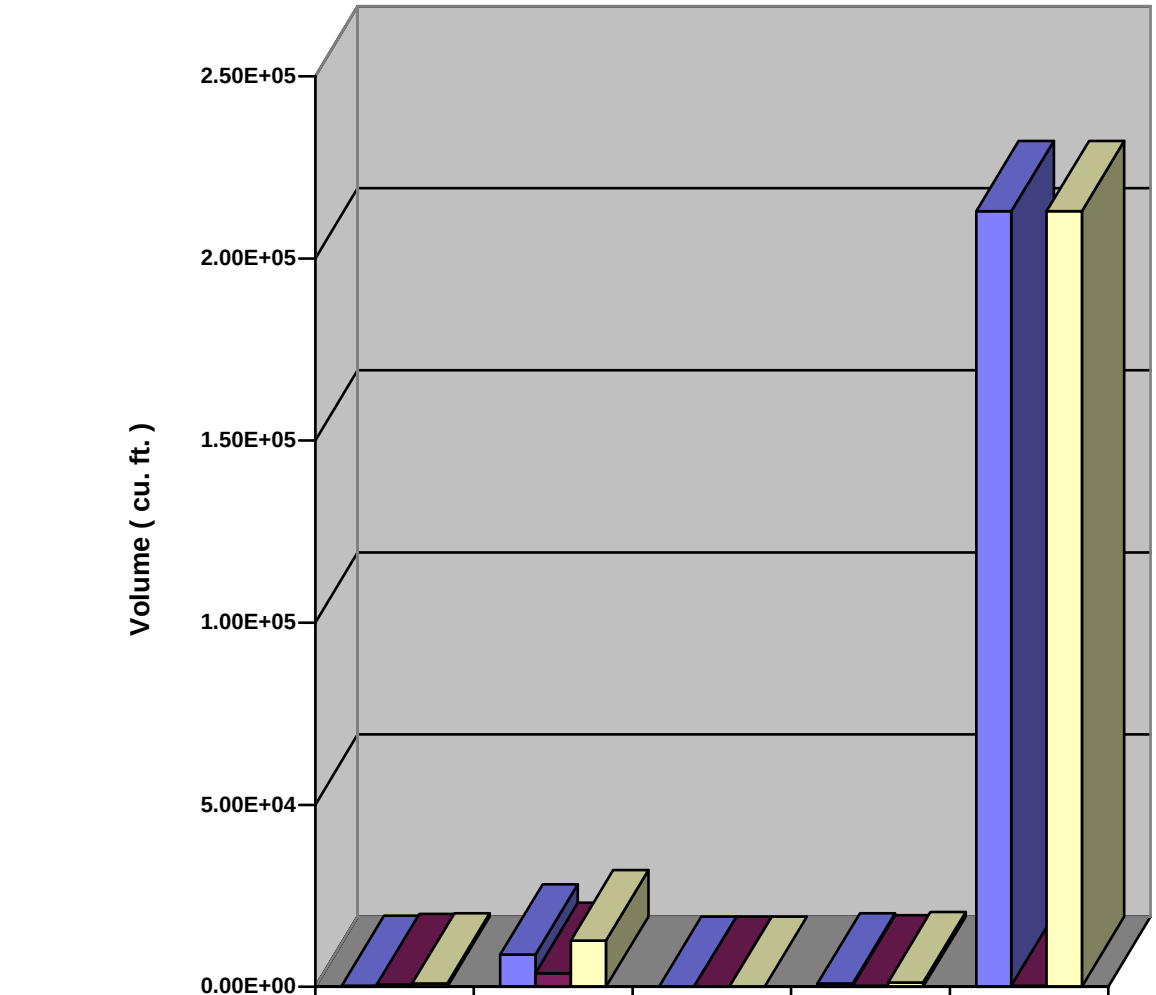


FIGURE 17

COMPARISON OF WASTE VOLUMES BY WASTE GENERATOR CATEGORY FOR 2004



	Academic	Commercial	Government	Health	Utility
Volume Transferred	2.50E+02	8.88E+03	6.80E-01	8.83E+02	2.13E+05
Volume Placed In Storage	6.52E+02	3.77E+03	0.00E+00	3.37E+02	3.18E+02
Volume Total	9.02E+02	1.27E+04	6.80E-01	1.22E+03	2.13E+05

Generator Category

TABLE 14

Activity and Volume by Waste Generator Category For 2004

Waste Generator Category	Activity (curies)			Volume (Cu. ft.)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
Academic	1.22	0.82	2.03	250.19	651.99	902.14
(Percent)	0.5%	0.0%	0.0%	0.1%	12.8%	0.4%
Commercial	138.16	5,887.62	6,025.79	8,883.93	3,773.44	12,667.36
(Percent)	60.3%	96.2%	94.9%	4.0%	74.3%	5.6%
Government	0.01	0.00	0.01	0.68	0.00	0.68
(Percent)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Health	2.10	0.38	2.48	883.42	337.15	1,220.57
(Percent)	0.9%	0.0%	0.0%	0.4%	6.6%	0.5%
Utility	87.77	232.40	320.17	212,978.20	317.90	213,296.10
(Percent)	38.3%	3.8%	5.0%	95.5%	6.3%	93.5%
Grand Total	**229.27**	**6,121.22**	**6,350.48**	**222,996.43**	**5,080.48**	**228,086.85**

FIGURE 18

VOLUME LLRW TRANSFERRED BY YEAR

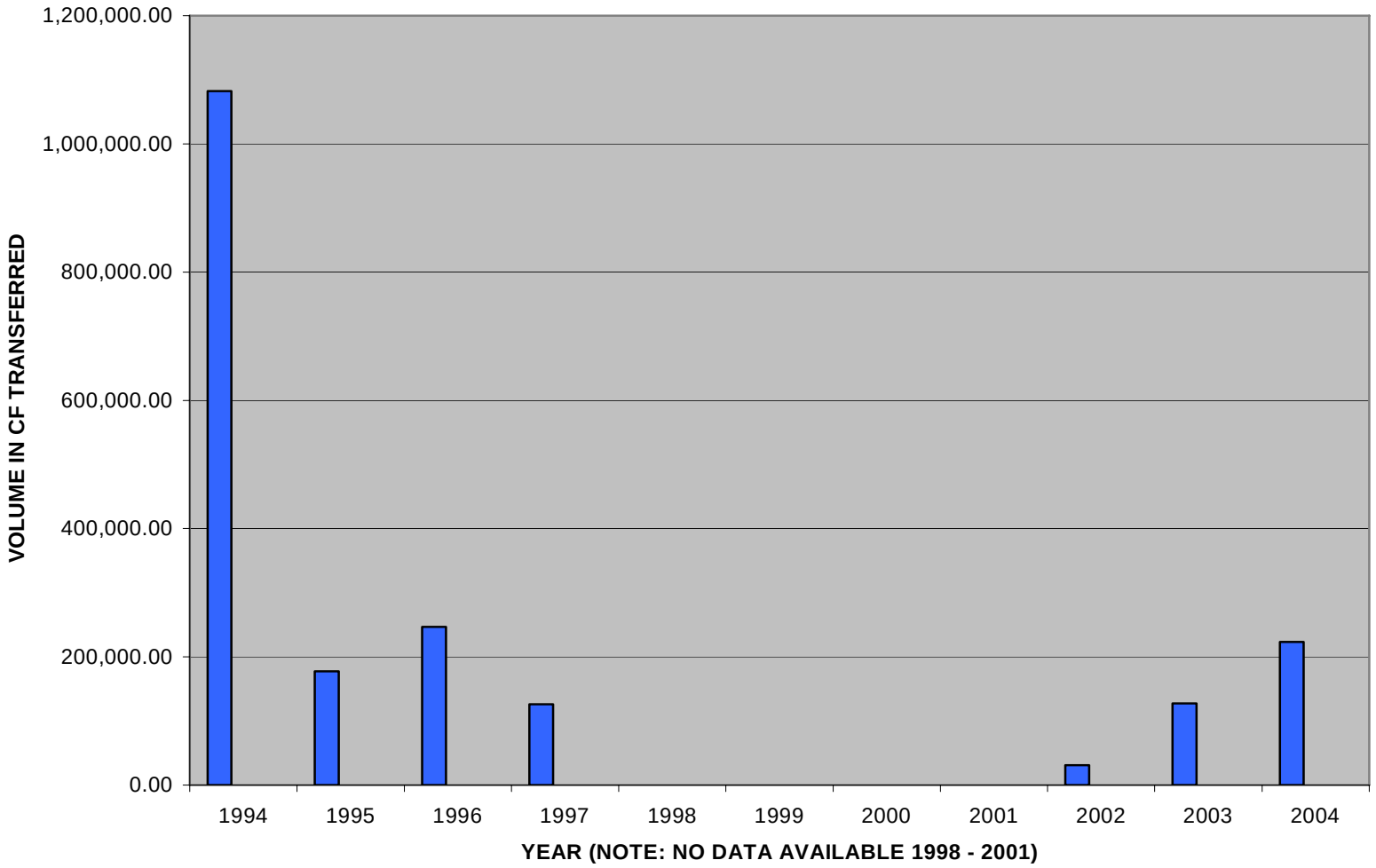


FIGURE 19

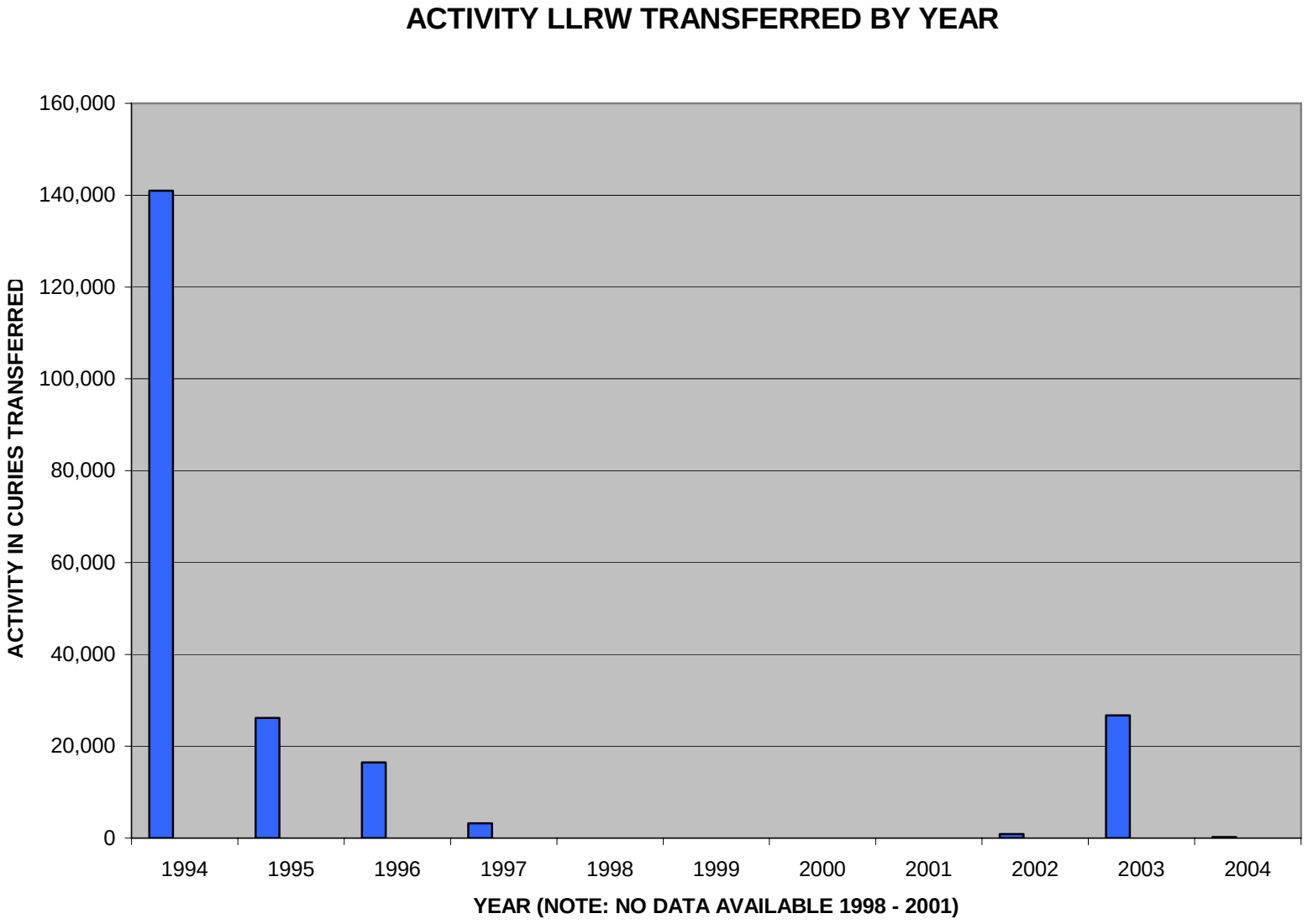

ACTIVITY LLRW TRANSFERRED BY YEAR
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
ACTIVITY IN CURIES TRANSFERRED
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
YEAR (NOTE: NO DATA AVAILABLE 1998 - 2001)

FIGURE 20
TOTAL RAM REPORTING FREQUENCY FOR ALL CLASSES OF WASTE IN 2004

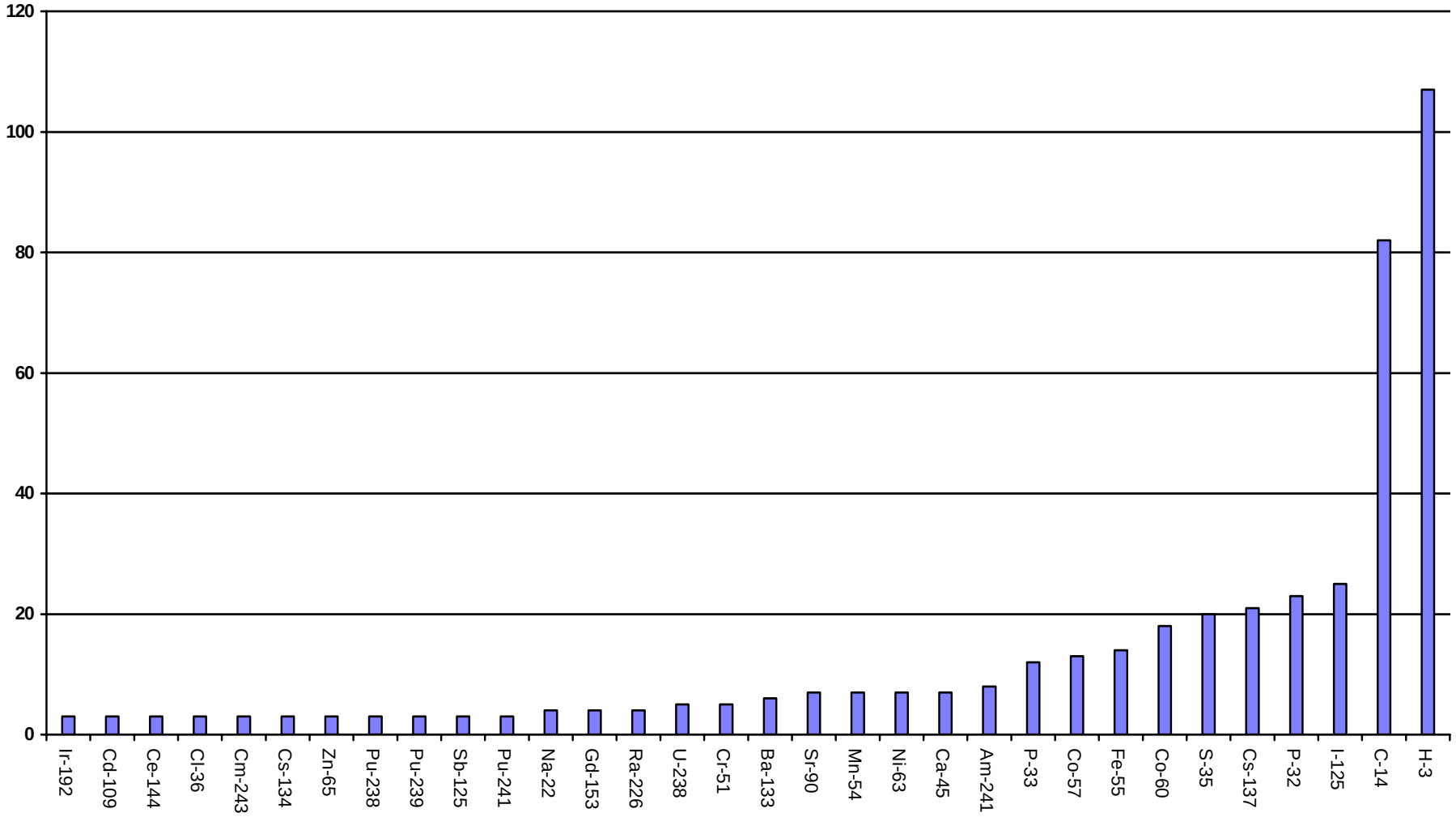


FIGURE 21
TOTAL RAM REPORTING FREQUENCY FOR CLASS A WASTE IN 2004

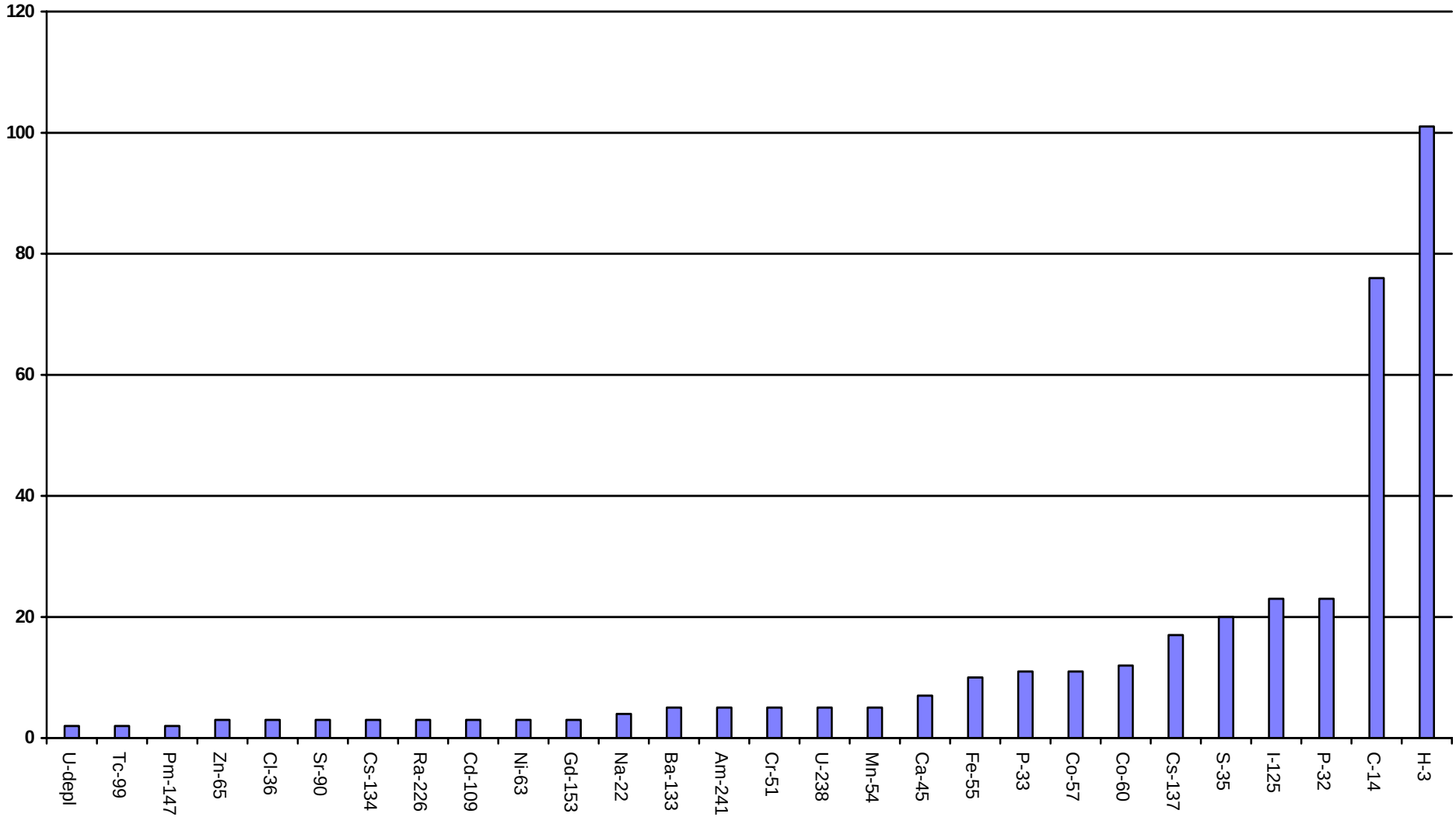


FIGURE 22
TOTAL RAM REPORTING FREQUENCY FOR CLASS B WASTE IN 2004

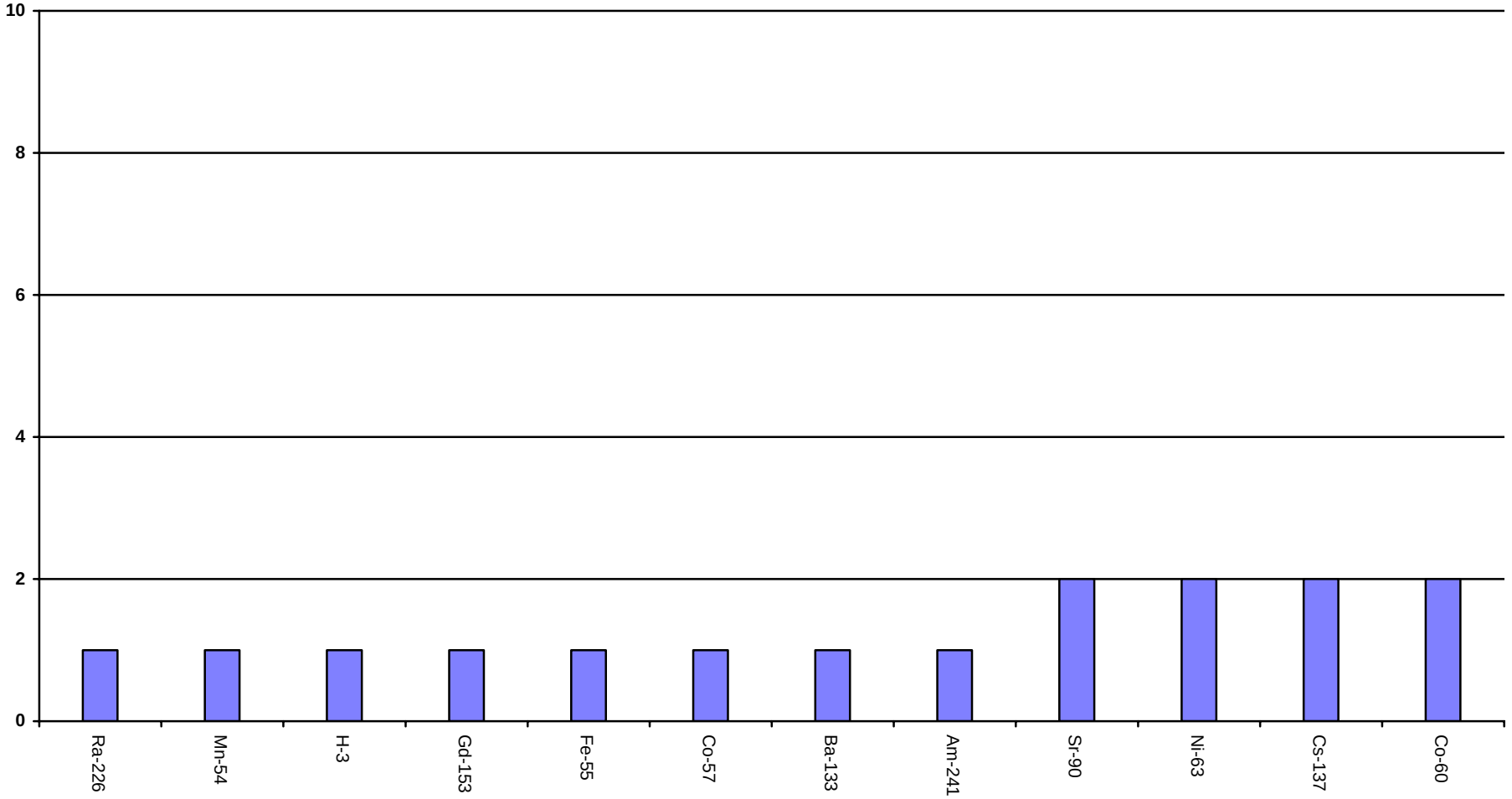


FIGURE 23
TOTAL RAM REPORTING FREQUENCY FOR CLASS C WASTE IN 2004

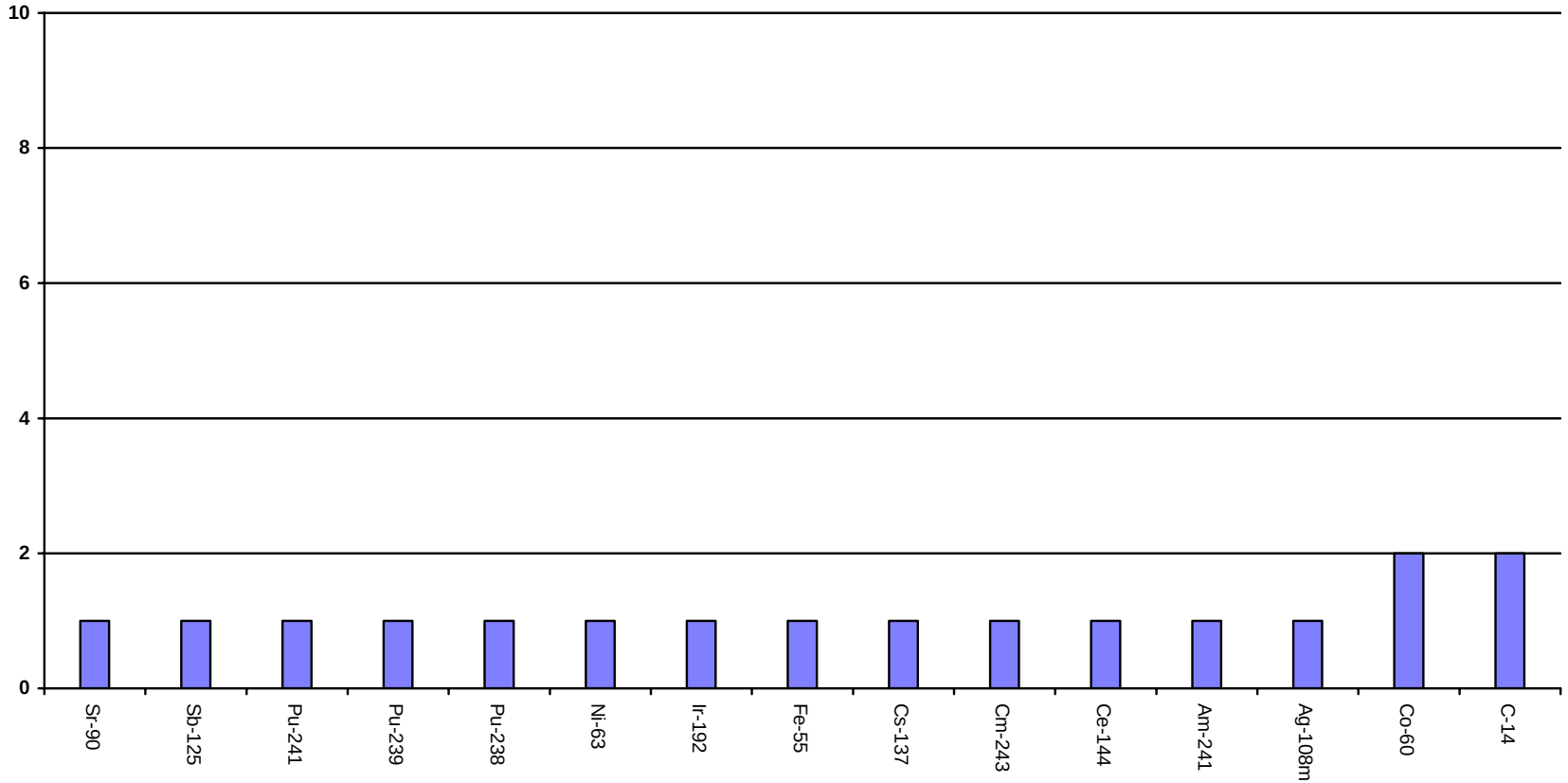


FIGURE 24
TOTAL RAM REPORTING FREQUENCY FOR HVLA WASTE IN 2004

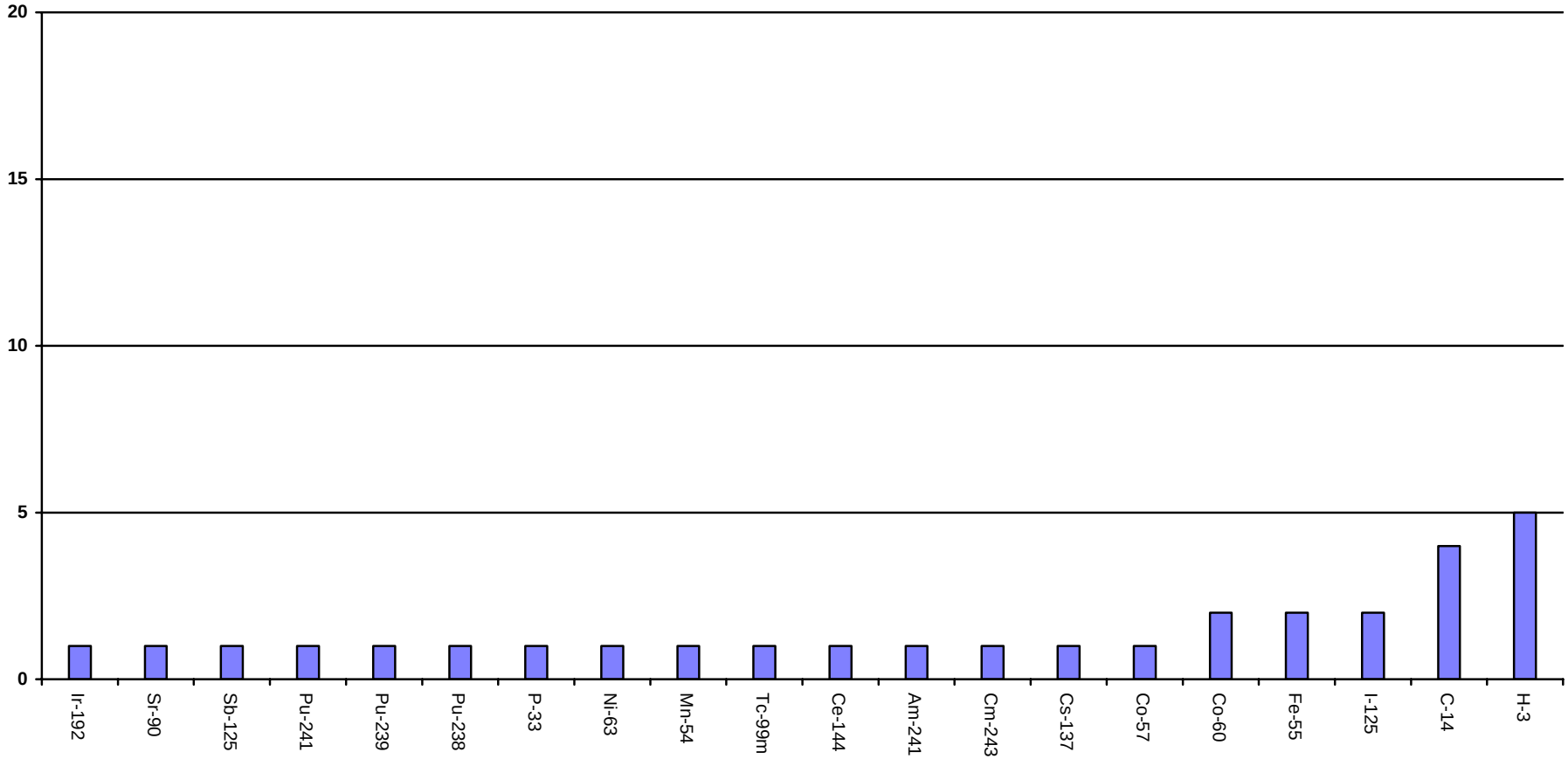


FIGURE 25
IN-STORAGE RAM REPORTING FREQUENCY FOR ALL CLASSES OF WASTE IN 2004

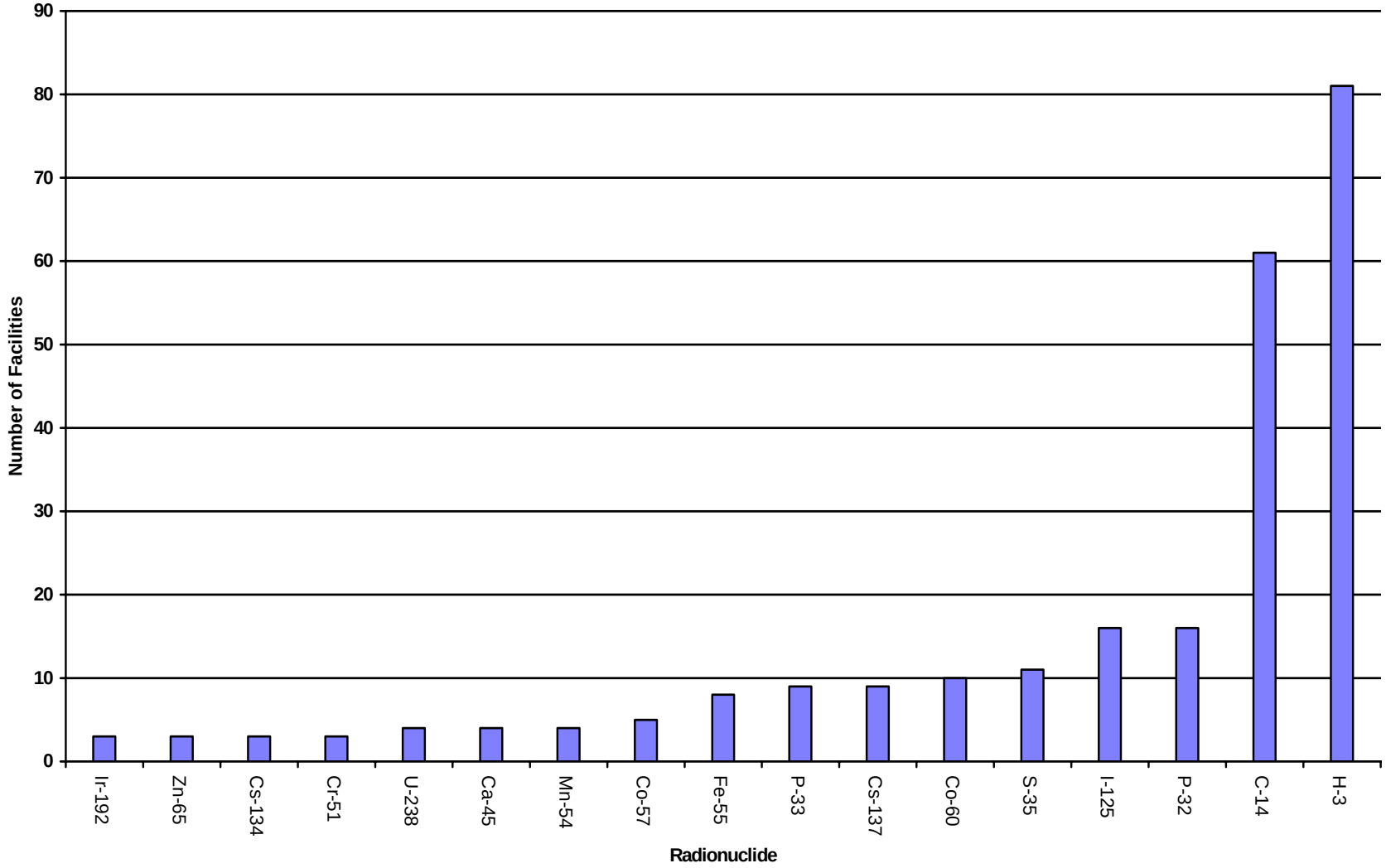


FIGURE 26
TRANSFERRED RAM REPORTING FREQUENCY FOR ALL CLASSES OF WASTE IN 2004

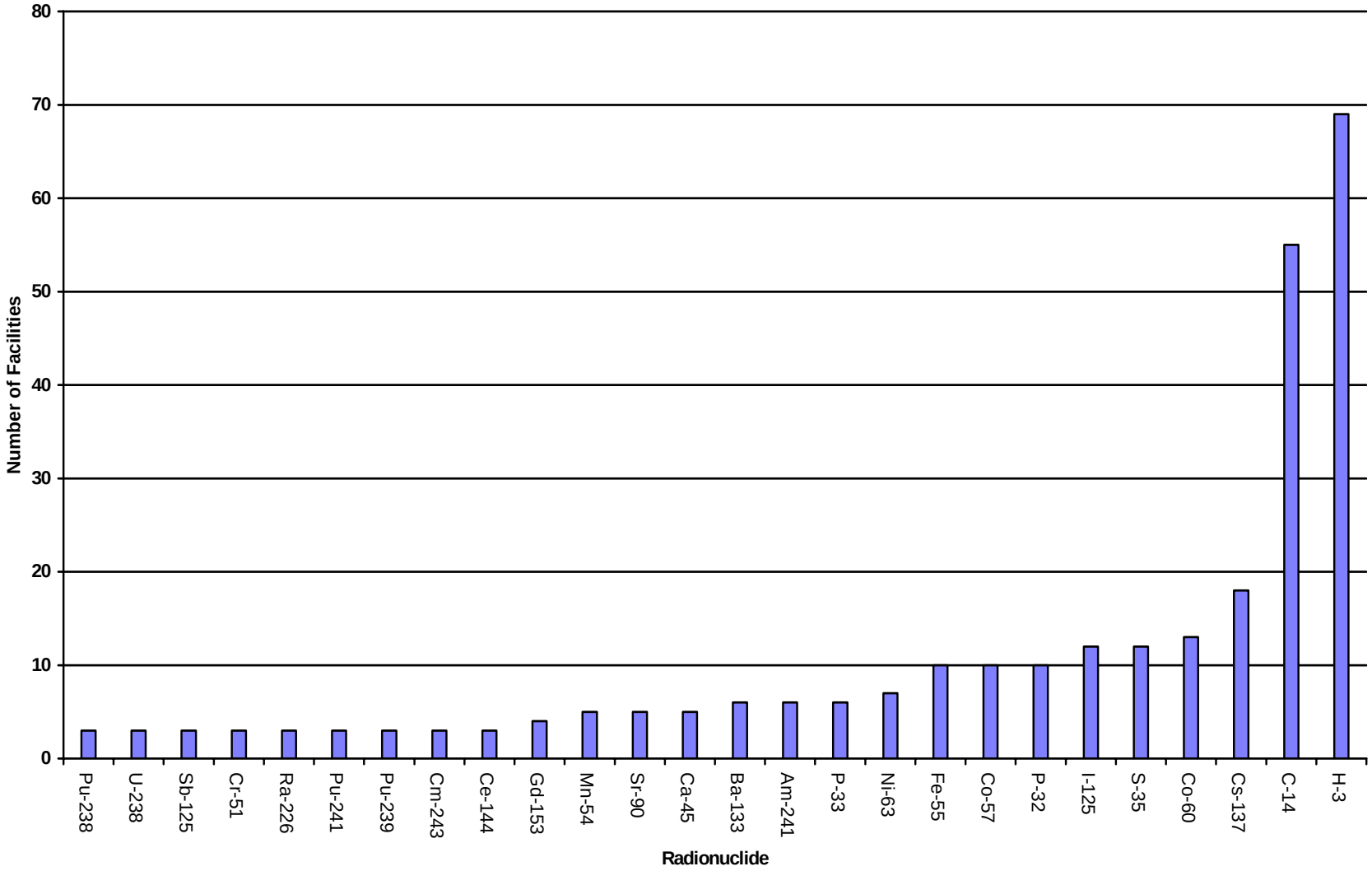


FIGURE 27
DISTRIBUTION OF ORGANIZATIONS THAT GENERATED WASTE IN 2004 - BY ACTIVITY

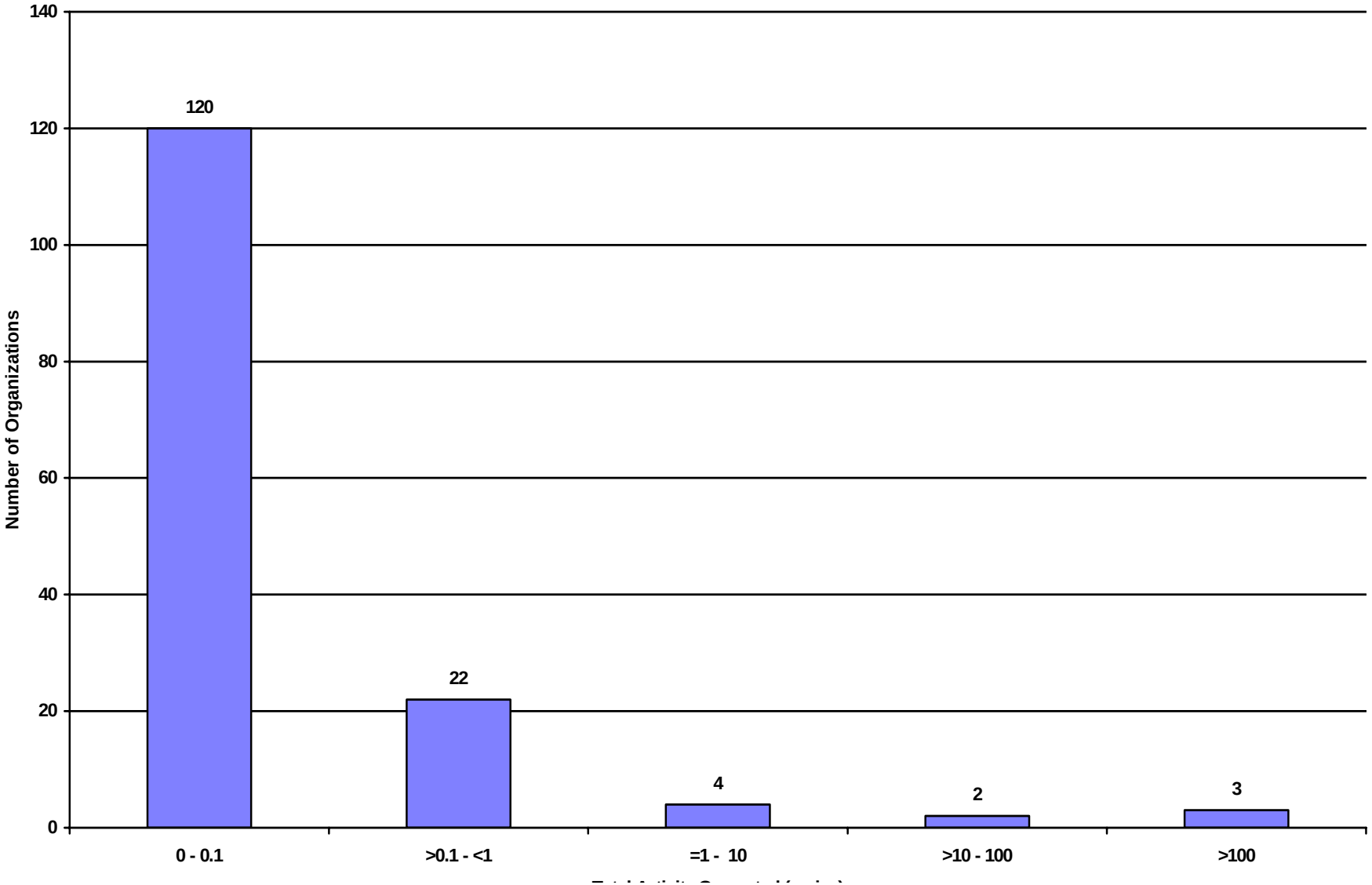


FIGURE 28
DISTRIBUTION OF ORGANIZATIONS THAT GENERATED WASTE IN 2004 - BY VOLUME

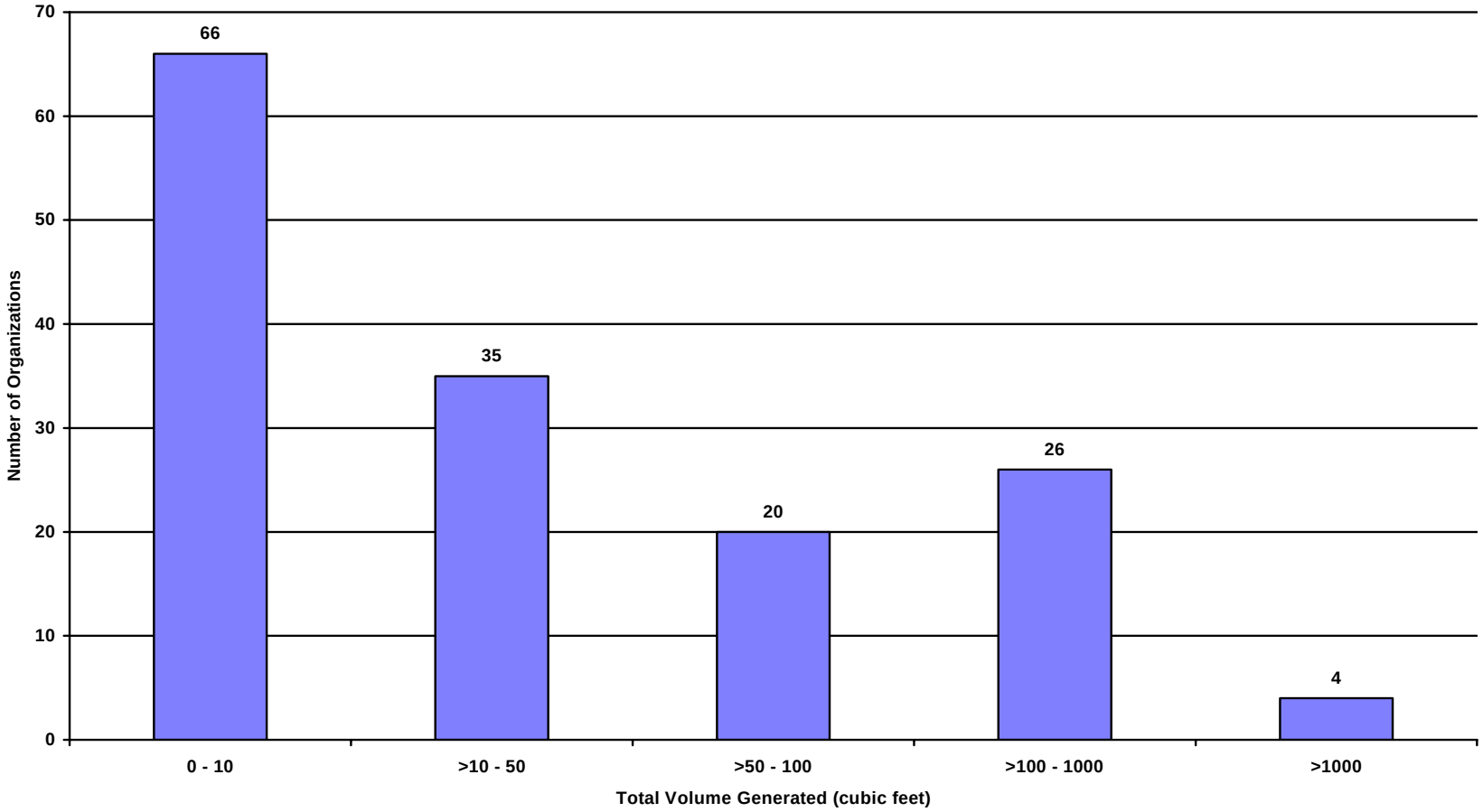


TABLE 15

List of Facilities Activities and Volumes Produced in 2004

	VOLUME (cu. ft.)			ACTIVITY (curies)		
Facility Name	**Transferred**	**In Storage**	**Total**	**Transferred**	**In Storage**	**Total**
ABBOTT BIORESEARCH CENTER, INC	0.0	7.5	7.5	0.000	0.007	0.007
ABC TESTING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ACLIN, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ACTION ENVIRONMENTAL, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ACTIVBIOTICS, INC.	0.0	6.0	6.0	0.000	0.006	0.006
ADAPTIVE OPTICS ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ADDISON GILBERT HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
ADVANCE TESTING CO. INC.	0.0	0.0	0.0	0.000	0.000	0.000
ADVANCED CARE PHARMACY	0.0	0.0	0.0	0.000	0.000	0.000
ADVANCED CELL TECHNOLOGY	0.0	0.0	0.0	0.000	0.000	0.000
ADVANCED MAGNETICS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
AEA TECHNOLOGY QSA, INC.	0.0	267.2	267.2	0.000	5,471.620	5,471.620
AGGREGATE INDUSTRIES-NORTHEAST	0.0	0.0	0.0	0.000	0.000	0.000
ALG ENVIRONMENTAL CONSULTING, LLC	0.0	0.0	0.0	0.000	0.000	0.000
ALKERMES, INC.	0.0	7.5	7.5	0.000	0.112	0.112
ALL STATE SERVICES ENVIRON.	0.0	0.0	0.0	0.000	0.000	0.000
ALLEGHENY RODNEY	0.0	0.0	0.0	0.000	0.000	0.000
ALLIANCE IMAGING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ALLIANCE IMAGING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ALLIED TESTING LABS., INC.	0.0	0.0	0.0	0.000	0.000	0.000
ALNYLAM PHARMACEUTICALS, INC.	8.2	0.0	8.2	0.005	0.000	0.005
ALPHA ANALYTICAL LAB., INC	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
ALTANA RESEARCH INSTITUTE	0.0	0.0	0.0	0.000	0.000	0.000
ALTRAN CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
AMERICAN ENG. & TESTING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
AMERICAN LEAD PAINT INSPECTORS	0.0	0.0	0.0	0.000	0.000	0.000
AMERICAN RED CROSS BLOOD SERV.	0.0	0.0	0.0	0.000	0.000	0.000
AMERSHAM BIOSCIENCES	0.0	0.0	0.0	0.000	0.000	0.000
AMGEN, INC.	22.5	22.5	45.0	0.001	0.001	0.002
AMHERST COLLEGE	7.3	22.0	29.4	0.002	0.006	0.008
AMPTEK, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ANALYTICAL ANSWERS , INC	0.0	0.0	0.0	0.000	0.000	0.000
ANGELL MEMORIAL ANIMAL HOSP.	0.0	0.0	0.0	0.000	0.000	0.000
ANNA JAQUES HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
ANTIGENICS INC.	0.0	4.0	4.0	0.000	0.003	0.003
A-PAINTING & LEAD DETECT. SERV	0.0	0.0	0.0	0.000	0.000	0.000
APPLIED BIOSYSTEMS	0.0	0.0	0.0	0.000	0.000	0.000
ARCHEMIX	0.0	4.0	4.0	0.000	0.020	0.020
ARIAD PHARMACEUTICALS, INC.	0.0	10.0	10.0	0.000	0.012	0.012
ARQULE, INC.	0.0	4.0	4.0	0.000	0.007	0.007
ASAP ENVIRONMENTAL INCORPORATED	0.0	0.0	0.0	0.000	0.000	0.000
ASPEN SQUARE MANAGEMENT	0.0	0.0	0.0	0.000	0.000	0.000
ASSURANCE TECHNOLOGY CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
ASTRAZENECA PHARMACEUTICALS LP	117.9	4.0	121.9	0.030	0.003	0.033
ATC ASSOCIATES, INC.	0.0	0.0	0.0	0.048	0.000	0.048
ATC ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ATC GROUP SERVICES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ATHENA DIAGNOSTICS, INC.	0.0	22.5	22.5	0.000	0.001	0.001
ATLANTIC NUCLEAR CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
AVANT IMMUNOTHERAPUTICS, INC.	0.0	10.5	10.5	0.000	0.007	0.007
AVENTIS PHARMACEUTICALS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
AVEO PHARMACEUTICALS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
AXIOM PARTNERS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
B.J. EDGE & ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
BAKER TESTING SERVICES INC.	0.0	0.0	0.0	0.000	0.000	0.000
BARTLETT NUCLEAR, INC.	515.5	30.0	545.5	0.000	0.000	0.001
BASCOM, SCOTT A.	0.0	0.0	0.0	0.000	0.000	0.000
BAYER HEALTHCARE LLC	0.0	0.7	0.7	0.000	0.000	0.000
BAYSTATE HEALTH SYSTEMS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
BECHTEL/PARSONS BRINCKERHOFF	0.0	0.0	0.0	0.000	0.000	0.000
BERKSHIRE MEDICAL CENTER	0.0	0.0	0.0	0.000	0.000	0.000
BETH ISRAEL DEACON. MED. CTR.	0.4	0.0	0.4	0.011	0.000	0.011
BETH ISRAEL DEACON.MED CENTER	0.0	0.0	0.0	0.000	0.000	0.000
BETH ISRAEL DEACONESS HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
BEVERLY HOSPITAL	0.7	0.0	0.7	0.003	0.000	0.003
BIO PROCESSORS CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
BIOGEN IDEC MA, INC.	22.5	60.0	82.5	0.003	0.017	0.020
BIOMEASURE, INC.	8.0	0.0	8.0	0.000	0.000	0.000
BIOMEDICAL TECHNOLOGIES, INC.	0.0	7.0	7.0	0.000	0.200	0.200
BIORELIANCE CORPORATION	0.5	0.0	0.5	0.001	0.000	0.001
BIOVEST INTERNATIONAL INCORPORATED	0.0	0.0	0.0	0.000	0.000	0.000
BLACKMAN, MEL	0.0	0.0	0.0	0.000	0.000	0.000
BOSTON BIOMEDICAL RES. INST.	0.0	0.0	0.0	0.001	0.000	0.001
BOSTON CHILDHOOD LEAD PAINT POISON PREV.	0.0	0.0	0.0	0.000	0.000	0.000
BOSTON COLLEGE	52.5	15.0	67.5	0.024	0.006	0.031
BOSTON HEART FOUNDATION	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
BOSTON SCIENTIFIC	0.0	2.2	2.2	0.000	0.000	0.000
BOSTON UNIV. CHARLES RIVER CAM	0.0	22.0	22.0	0.000	0.003	0.003
BOSTON UNIVERSITY MED CTR HOSP	107.3	0.0	107.3	0.035	0.000	0.035
BRANDEIS UNIVERSITY	0.0	37.5	37.5	0.000	0.153	0.153
BRIDGEWATER GODDARD PARK MED	0.1	0.0	0.1	0.003	0.000	0.003
BRIDGEWATER STATE COLLEGE	0.0	0.0	0.0	0.000	0.000	0.000
BRIGHAM & WOMEN'S HOSPITAL	0.0	126.9	126.9	0.000	0.194	0.194
BRISTOL-MYERS SQUIBB MED. IMG.	1,301.0	80.8	1,381.8	2.065	0.358	2.423
BROCKTON BOARD OF HEALTH	0.0	0.0	0.0	0.000	0.000	0.000
BROCKTON CARDIOLOGY ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
BROCKTON HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
BROWN AND CALDWELL	0.0	0.0	0.0	0.000	0.000	0.000
BRUKER DALTONICS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
CAMBREX BIO SCIENCE MA, INC.	75.6	22.5	98.1	0.013	0.004	0.017
CAMBRIDGE PUB. HEALTH ALLIANCE	0.0	0.0	0.0	0.000	0.000	0.000
CAMP DRESSER & MCKEE, INC.	0.0	0.0	0.0	0.000	0.000	0.000
CAPE COD HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
CAPFILM / ELECTRONIC CONCEPTS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
CAPITAL CARDIOLOGY ASSOC.,P.C	0.0	0.0	0.0	0.000	0.000	0.000
CARDINAL HEALTH 414, INC.	0.0	0.0	0.0	0.000	0.000	0.000
CARDINAL HEALTH 420, LLC	0.0	0.0	0.0	0.000	0.000	0.000
CARDIOLOGY CONSULT.OF CENTRAL MASS., LLP	0.0	0.0	0.0	0.000	0.000	0.000
CARDIOVASCULAR SPECIALISTS, LLC	0.0	0.0	0.0	0.000	0.000	0.000
CARITAS CARNEY HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
CARITAS GOOD SAMARITAN MED CENTER	0.0	0.0	0.0	0.000	0.000	0.000
CARITAS HOLY FAMILY HOSPITAL AND MED CTR	0.7	0.0	0.7	0.003	0.000	0.003
CARITAS NORWOOD HOSPITAL	25.7	0.0	25.7	0.059	0.000	0.059

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
CARITAS PET IMAGING, LLC	0.0	0.0	0.0	0.000	0.000	0.000
CARITAS SOUTHWOOD HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
CAT HOSPITAL, THE	0.0	0.0	0.0	0.000	0.000	0.000
CATALDO, JOSEPH P.	0.0	0.0	0.0	0.000	0.000	0.000
CAULFIELD ENVIRONMENTAL	0.0	0.0	0.0	0.000	0.000	0.000
CBR INSTITUTE FOR BIOMED. RESEARCH, INC.	0.0	52.5	52.5	0.000	0.020	0.020
CELL SIGNALING TECHNOLOGY	0.0	0.0	0.0	0.000	0.000	0.000
CHADWICK MEDICAL ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
CHARLES RIVER LABORATORIES,INC	595.0	56.0	651.0	0.042	0.000	0.042
CHARLES RIVER PHARMSERVICES	0.0	0.0	0.0	0.000	0.000	0.000
CHARLES STARK DRAPER LAB., INC	0.0	0.0	0.0	0.000	0.000	0.000
CHARM SCIENCES INC.	36.9	15.0	51.9	0.009	0.004	0.013
CHEMIC LABORATORIES, INC.	0.0	8.0	8.0	0.000	0.005	0.005
CHILD SAFE LEAD PAINT	0.0	0.0	0.0	0.000	0.000	0.000
CHILDREN'S HOSPITAL, THE	67.5	60.0	127.5	0.063	0.031	0.094
CIS-US, INC.	0.0	0.0	0.0	0.000	0.000	0.000
CITY OF FITCHBURG	0.0	0.0	0.0	0.000	0.000	0.000
CLARK UNIVERSITY	0.0	0.0	0.0	0.000	0.000	0.000
CLINICAL SCIENCE LAB., INC.	0.0	0.0	0.0	0.000	0.000	0.000
COASTAL ENGINEERING CO., INC.	0.0	0.0	0.0	0.000	0.000	0.000
COLLEGE OF OUR LADY OF ELMS	0.0	0.0	0.0	0.000	0.000	0.000
COLLEGE OF THE HOLY CROSS	0.0	0.0	0.0	0.000	0.000	0.000
COMBINATORX, INC.	36.5	16.1	52.6	0.000	0.001	0.001
COMMUNICATIONS & POWER INDUST.	23.9	0.0	23.9	46.600	0.000	46.600
COMPOUND THERAPEUTICS, INC.	4.0	10.0	14.0	0.003	0.009	0.012
CONAM INSPECTION	0.0	0.0	0.0	0.000	0.000	0.000
COOLEY DICKINSON HOSPITAL, INC	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
COVINO ENVIRON. ASSOC. INC.	0.0	0.0	0.0	0.000	0.000	0.000
CRANE & CO., INC.	0.0	0.0	0.0	0.000	0.000	0.000
CRANE ENVIRONMENTAL CONSULTANTS, LLC	0.0	0.0	0.0	0.000	0.000	0.000
CRITICAL THERAPEUTICS, INC,	0.0	0.0	0.0	0.000	0.000	0.000
CUBIST PHARMACEUTICALS, INC.	43.0	25.8	68.8	0.043	0.005	0.049
CURIS, INC.	37.1	1.9	38.9	0.001	0.000	0.001
CYTRX LABORATORIES, INC.	0.0	4.0	4.0	0.000	0.002	0.002
DAIICHI ASUBIO MED.RESEARCH LAB., LLC.	0.0	2.0	2.0	0.000	0.000	0.000
DANA-FARBER CANCER INSTITUTE	435.0	0.0	435.0	0.850	0.000	0.850
DAVID & SON LEAD INSPECTIONS	0.0	0.0	0.0	0.000	0.000	0.000
DIGIRAD IMAGING SOLUTIONS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
DISCOVERY LABWARE, INC.	65.8	25.1	90.9	0.008	0.002	0.010
DIVERSIFIED ENVIRONMENTAL CORP	0.0	0.0	0.0	0.000	0.000	0.000
DOMINION ENERGY BRAYTON POINT, LLC	0.0	0.0	0.0	0.000	0.000	0.000
DOMINION ENERGY SALEM HARBOR, LLC	0.0	0.0	0.0	0.000	0.000	0.000
DOSITEC, INC.	0.0	0.0	0.0	0.000	0.000	0.000
E.T. & L. CORP.	0.0	0.0	0.0	0.000	0.000	0.000
EASTERN NAZARENE COLLEGE	0.0	0.0	0.0	0.000	0.000	0.000
EGS GAUGING INCORPORATED	0.0	0.0	0.0	0.000	0.000	0.000
EISAI RESEARCH INSTITUTE	8.0	8.0	16.0	0.015	0.050	0.065
ELIXIR PHARMACEUTICALS, INC.	3.0	4.0	7.0	0.050	0.190	0.240
EMD LEXIGEN RESEARCH CENTER CORPORATION	48.1	15.7	63.8	0.015	0.004	0.019
EMERALD LEAD TESTING CO.	0.0	0.0	0.0	0.000	0.000	0.000
EMERSON HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
ENANTA PHARMACEUTICALS	30.0	0.0	30.0	0.010	0.000	0.010
ENSR INTERNATIONAL	0.0	0.0	0.0	0.000	0.000	0.000
ENTERGY NUCLEAR GENERATING COMPANY	21,076.6	317.9	21,394.5	63.300	232.400	295.700

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
ENVIRONMENTAL AND LEAD PT INSP	0.0	0.0	0.0	0.000	0.000	0.000
ENVIRONMENTAL COMPLIANCE SERV	0.0	0.0	0.0	0.000	0.000	0.000
ENVIRONMENTAL HEALTH & ENGINEERING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ENVIRONMENTAL LEAD DETECTION, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ENVIRONMENTAL PARTNERS GROUP, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ENVIRONMENTAL STRATEGIES & MANAGE. INC.	0.0	0.0	0.0	0.000	0.000	0.000
ENVIRONMENTAL TESTING SVCS.INC	0.0	0.0	0.0	0.000	0.000	0.000
ENVIROSCIENCE CONSULTANTS, INC	0.0	0.0	0.0	0.000	0.000	0.000
ENVIROSENSE, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ENVIROTEST LABORATORY	0.0	0.0	0.0	0.000	0.000	0.000
EPIC THERAPEUTICS, INC.	0.0	45.0	45.0	0.000	0.000	0.000
EPIX PHARMACEUTICALS, INC.	52.5	0.0	52.5	0.002	0.000	0.002
ERM	0.0	0.0	0.0	0.000	0.000	0.000
EUKARION, INC.	0.0	0.0	0.0	0.000	0.000	0.000
EXACT SCIENCES CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
EXALPHA BIOLOGICALS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
EYETECH PHARMACEUTICALS, INC.	29.9	0.0	29.9	0.004	0.000	0.004
F. H. PETERSON MACHINE CORP.	0.0	0.0	0.0	0.000	0.000	0.000
F.X. MASSE ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
FAIRVIEW HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
FALMOUTH HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
FAULKNER HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
FITCHBURG BOARD OF HEALTH	0.0	0.0	0.0	0.000	0.000	0.000
FITCHBURG STATE COLLEGE	0.0	0.0	0.0	0.000	0.000	0.000
FORSYTH INSTITUTE THE	0.0	7.5	7.5	0.000	0.001	0.001
FRAMATOME ANP, INC.	110.0	70.0	180.0	0.020	0.010	0.030
FRANKLIN ANALYTICAL SERVICES	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
FSL ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GAETA, NEIL A.,	0.0	0.0	0.0	0.000	0.000	0.000
GAF MATERIALS CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
GALANEK, MITCHELL S.	0.0	0.0	0.0	0.000	0.000	0.000
GALEOTA ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GE ION TRACK	0.0	0.0	0.0	0.000	0.000	0.000
GEI CONSULTANTS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GEM ENVIRONMENTAL	0.0	0.0	0.0	0.000	0.000	0.000
GENE LOGIC, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GENERAL DYNAMICS DEFENSE SYS.	0.0	0.0	0.0	0.000	0.000	0.000
GENERAL ELECTRIC MEDICAL SYSTEMS	0.0	0.0	0.0	0.000	0.000	0.000
GENETICS INSTITUTE, LLC	130.8	568.2	699.0	0.085	0.049	0.134
GENETIX PHARMACEUTICALS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GENVEC, INC.	0.0	15.0	15.0	0.000	0.012	0.012
GENZYME BIOSURGERY	0.0	0.0	0.0	0.000	0.000	0.000
GENZYME CORPORATION	550.0	175.0	725.0	0.000	0.400	0.400
GEODESIGN, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GEOTECHNICAL CONSULTANTS, INC	0.0	0.0	0.0	0.000	0.000	0.000
GEOTECHNICAL GROUP INC.(TGG)	0.0	0.0	0.0	0.000	0.000	0.000
GEOTECHNICAL SERVICES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GEOTESTING EXPRESS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GILLETTE COMPANY, THE	0.0	12.0	12.0	0.000	0.000	0.000
GOLDMAN ENVIRONMENTAL CONSULT.	0.0	0.0	0.0	0.000	0.000	0.000
GPC BIOTEC, INCORPORATED	4.1	30.6	34.7	0.005	0.045	0.051
GRANGER-LYNCH CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
GRANITE MEDICAL GROUP	0.0	0.0	0.0	0.000	0.000	0.000
GREATER BOSTON LEAD PAINT TESTING	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
GUNTLOW & ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
GWATHMEY, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GZA GEOENVIRONMENTAL, INC.	0.0	0.0	0.0	0.000	0.000	0.000
HALEY & ALDRICH, INC.	0.0	0.0	0.0	0.000	0.000	0.000
HALLMARK HEALTH SYSTEM, INC.	0.0	0.0	0.0	0.000	0.000	0.000
HAMILTON THORNE BIOSCIENCES	0.0	0.0	0.0	0.000	0.000	0.000
HARBOR MEDICAL ASSOCIATES, PC	0.0	0.0	0.0	0.000	0.000	0.000
HARDIN-KIGHT ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
HARRINGTON MEMORIAL HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
HARRIS, JEFFRERY W.	0.0	0.0	0.0	0.000	0.000	0.000
HARTIN, ROBERT	0.0	0.0	0.0	0.000	0.000	0.000
HARVARD ENVIRONMENTAL SERVICE	0.0	0.0	0.0	0.000	0.000	0.000
HARVARD UNIVERSITY	2.8	0.0	2.8	0.570	0.000	0.570
HARVARD VANGUARD MED. ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
HAWTHORN MEDICAL ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
HEART CENTER, THE	0.0	0.0	0.0	0.000	0.000	0.000
HEARTSAFE	0.0	0.0	0.0	0.000	0.000	0.000
HEMMILA, FREDERIC J.	0.0	0.0	0.0	0.000	0.000	0.000
HERLEY NEW ENGLAND	37.5	15.0	52.5	0.002	0.000	0.002
HEYWOOD HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
HIGGINS ENVIRONMENTAL ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
HOLYOKE HOSPITAL, INC.	0.0	0.0	0.0	0.000	0.000	0.000
HOMEINEX CORP.	0.0	0.0	0.0	0.000	0.000	0.000
HOPEDALE CARDIOLOGY, LLP	0.0	0.0	0.0	0.000	0.000	0.000
HORNE, DAVID C.	0.0	0.0	0.0	0.000	0.000	0.000
HOUSING ENVIRONMENTAL SERV.	0.0	0.0	0.0	0.000	0.000	0.000
HUSTON, GERALD F., SR.	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
HYBRIDON, INC.	16.4	8.2	24.6	0.007	0.007	0.014
HYGIENETICS ENVIRON. SERVICES	0.0	0.0	0.0	0.000	0.000	0.000
IDENIX (MASSACHUSETTS) INC.	43.0	2.3	45.2	0.016	0.000	0.016
IEL SERVICE, INC.	0.0	0.0	0.0	0.000	0.000	0.000
IMAGING ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
IMMERGE BIOPHARMACEUTICALS, INC.	0.7	0.0	0.7	0.000	0.000	0.000
IMMUNOGEN, INC.	22.2	0.0	22.2	0.245	0.000	0.245
IMPERIAL INSPECTION SERVICES	0.0	0.0	0.0	0.000	0.000	0.000
IMPLANT SCIENCES CORP.	0.0	4.0	4.0	0.000	0.000	0.000
INDUSTRIAL NUCLEAR COMPANY,INC	0.0	0.0	0.0	0.000	0.000	0.000
INFINITY PHARMACEUTICALS, INC	32.0	4.0	36.0	0.066	0.001	0.067
INNOV-X SYSTEMS	0.0	0.0	0.0	0.000	0.000	0.000
INOTEK PHARMACEUTICAL CORPORATION	37.5	15.0	52.5	0.001	0.000	0.001
INSIGHT HEALTH CORP.	0.0	0.0	0.0	0.000	0.000	0.000
INTER MED ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
INTERLEUKIN GENETICS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
INTERNAL MEDICINE & CARDIOLOGY ASSOC.	0.0	0.0	0.0	0.000	0.000	0.000
ITI QUALITEK, INC.	0.0	0.0	0.0	0.000	0.000	0.000
J & M INSPECTIONAL SVCS. INC.	0.0	0.0	0.0	0.000	0.000	0.000
JACOBS CIVIL INC.	0.0	0.0	0.0	0.000	0.000	0.000
JAY CASHMAN, INC.	0.0	0.0	0.0	0.000	0.000	0.000
JGI EASTERN, INC.	0.0	0.0	0.0	0.000	0.000	0.000
JHR CONTRACTING	0.0	0.0	0.0	0.000	0.000	0.000
JOHNSON FOILS	0.0	0.0	0.0	0.000	0.000	0.000
JONES, ROBBIN D.	0.0	0.0	0.0	0.000	0.000	0.000
JORDAN HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
JOSLIN DIABETES CENTER, INC.	67.5	22.5	90.0	0.068	0.001	0.069

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
KANE, JACK	0.0	0.0	0.0	0.000	0.000	0.000
KEVILLE ENTERPRISES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
KIDDE-FENWAL, INC.	0.0	0.0	0.0	0.000	0.020	0.020
LAHEY CLINIC FOUNDATION	0.0	0.0	0.0	0.000	0.000	0.000
LANE CONSTRUCTION CORP. THE	0.0	0.0	0.0	0.000	0.000	0.000
LAWRENCE GENERAL HOSPITAL	0.0	1.0	1.0	0.000	0.030	0.030
LAWRENCE PUMPS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
LEAD PAINT TESTING CO., THE	0.0	0.0	0.0	0.000	0.000	0.000
LEADSAFE ENVIRONMENTAL SVCS.	0.0	0.0	0.0	0.000	0.000	0.000
LESSARD ENVIRONMENTAL, INC.	0.0	0.0	0.0	0.000	0.000	0.000
LFR INC.	0.0	0.0	0.0	0.000	0.000	0.000
LOVELY, PAUL	0.0	0.0	0.0	0.000	0.000	0.000
LOWELL GENERAL HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
LYNCH, BERNARD	0.0	0.0	0.0	0.000	0.000	0.000
M&M LEAD INSPECTIONAL SVCS.	0.0	0.0	0.0	0.000	0.000	0.000
M/A-COM INCORPORATED	0.0	0.0	0.0	0.000	0.000	0.000
MALDEN REDEVELOPMENT AUTHORITY	0.0	0.0	0.0	0.000	0.000	0.000
MALLINCKRODT, INC.	0.0	0.0	0.0	0.000	0.000	0.000
MARINE BIOLOGICAL LABORATORY	56.0	31.0	97.0	0.122	0.101	0.223
MASS. -AMHERST, UNIVERSITY OF	0.0	198.4	198.4	0.000	0.013	0.013
MASS. BIOMEDICAL INITIATIVES	12.3	0.0	12.3	0.002	0.000	0.002
MASS. -BOSTON, UNIVERSITY OF	0.0	0.9	0.9	0.000	0.017	0.017
MASS. COLLEGE OF PHARMACY	0.0	7.5	7.5	0.000	0.001	0.001
MASS. -DARTMOUTH, UNIV. OF	0.0	3.0	3.0	0.000	0.001	0.001
MASS. DEPT OF PUBLIC HEALTH	0.0	0.0	0.0	0.000	0.000	0.000
MASS. DEPT. ENVIRONMENTAL PROT	0.0	0.0	0.0	0.000	0.000	0.000
MASS. DEPT. OF LABOR & WORKFORCE DEV.	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
MASS. DPH CHILD LEAD POIS PREV	0.0	0.0	0.0	0.000	0.000	0.000
MASS. EMERG. MGT. AGENCY	0.0	0.0	0.0	0.000	0.000	0.000
MASS. EYE & EAR INFIRMARY	0.0	0.0	0.0	0.000	0.000	0.000
MASS. GENERAL HOSPITAL	97.5	109.5	207.0	0.038	0.049	0.087
MASS. HIGHWAY DEPARTMENT	0.0	0.0	0.0	0.000	0.000	0.000
MASS. INSTITUTE OF TECHNOLOGY	1.8	237.0	238.8	0.095	0.095	0.190
MASS. -LOWELL, UNIVERSITY OF	0.0	3.0	3.0	0.000	0.010	0.010
MASSACHUSETTS MOBILE PET, P.C.	0.0	0.0	0.0	0.000	0.000	0.000
MEDCATH, INC.	0.0	0.0	0.0	0.000	0.000	0.000
MEDI-PHYSICS, INC. DBA GE HEALTHCARE	0.0	0.0	0.0	0.000	0.000	0.000
MERCK & CO., INC.	0.0	0.0	0.0	0.000	0.000	0.000
MERCURY THERAPEUTICS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
MERCY HOSPITAL, INC., THE	0.0	3.0	3.0	0.000	0.001	0.001
MERRIMACK COLLEGE	0.0	0.0	0.0	0.000	0.000	0.000
MERRIMACK VALLEY CARD. ASSOC.	0.0	0.0	0.0	0.000	0.000	0.000
MERRIMACK VALLEY HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
METABOLIX, INC.	0.0	0.0	0.0	0.000	0.000	0.000
METROWEST MEDICAL CENTER	0.0	0.0	0.0	0.000	0.000	0.000
MGI PHARMA BIOLOGICS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
MICROBIA, INC.	38.7	25.3	64.1	0.021	0.006	0.026
MICROCHIPS, INC.	7.5	7.5	15.0	0.000	0.000	0.000
MICROTEST LABORATORIES, INC.	5.5	0.0	5.5	0.019	0.000	0.019
MID-CITY SCRAP IRON & SALVAGE CO., INC.	0.0	0.0	0.0	0.000	0.000	0.000
MILFORD WHITINSVILLE HOSPITAL	0.1	0.0	0.1	0.002	0.000	0.002
MILLENNIUM PHARMACEUTICALS	279.0	37.5	316.5	0.434	0.007	0.441
MILLER ENGINEERING & TESTING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
MILLER, P. TERRY	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
MILLIPORE CORPORATION	15.4	0.0	15.4	0.004	0.000	0.004
MILLIPORE CORPORATION	30.0	13.5	43.5	0.005	0.003	0.008
MILTON HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
MINUTEMAN ENVIRONMENTAL SEVICES INC.	0.0	0.0	0.0	0.000	0.000	0.000
MOLECULAR INSIGHT PHARMACEUTICALS, INC.	225.0	0.0	225.0	0.002	0.000	0.002
MORTON HOSPITAL & MED. CENTER	0.0	0.0	0.0	0.000	0.000	0.000
MOUNT AUBURN HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
MOUNT HOLYOKE COLLEGE	0.0	0.5	0.5	0.000	0.000	0.000
MUSEUM OF FINE ARTS (BOSTON)	0.0	0.0	0.0	0.024	0.000	0.024
NASHOBA VALLEY MEDICAL CENTER	0.0	0.0	0.0	0.000	0.000	0.000
NAVIX DIAGNOSTIX, INC (FIXED)	0.0	0.0	0.0	0.000	0.000	0.000
NAVIX DIAGNOSTIX, INC (MOBILE)	0.0	0.0	0.0	0.000	0.000	0.000
NEW BEDFORD HEALTH DEPARTMENT	0.0	0.0	0.0	0.000	0.000	0.000
NEW BEDFORD MEDICAL ASSOCIATE	0.0	0.0	0.0	0.000	0.000	0.000
NEW ENG. COLLEGE OF OPTOMETRY	0.0	0.0	0.0	0.000	0.000	0.000
NEW ENG. P.E.T.NET DIST.CENTER, LLC	0.0	0.1	0.1	0.000	0.100	0.100
NEW ENG.PET OF GREATER LOWELL	0.0	0.0	0.0	0.000	0.000	0.000
NEW ENGLAND BAPTIST HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
NEW ENGLAND BIOLABS, INC.	0.0	21.5	21.5	0.000	0.010	0.010
NEW ENGLAND CARDIOLOGY, LLC	0.0	0.0	0.0	0.000	0.000	0.000
NEW ENGLAND MEDICAL SPECIALISTS	0.0	0.0	0.0	0.000	0.000	0.000
NEW ENGLAND PET IMAGING SYSTM	0.0	0.0	0.0	0.000	0.000	0.000
NEWTON HEALTH DEPT., CITY OF	0.0	0.0	0.0	0.000	0.000	0.000
NEWTON HOUSING REHAB./CITY OF	0.0	0.0	0.0	0.000	0.000	0.000
NITON CORPORATION	0.0	1.5	1.5	0.000	0.501	0.501
NITROMED, INC.	0.0	0.0	0.0	0.000	0.000	0.000
NOBLE HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
NORFOLK COUNTY CARDIOLOGY ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
NORFOLK LEAD INSPECTION	0.0	0.0	0.0	0.000	0.000	0.000
NORFOLK RAM GROUP, LLC	0.0	0.0	0.0	0.000	0.000	0.000
NORTH ADAMS REGIONAL HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
NORTH SHORE CARDIOVASCULAR ASSOCIATES,	0.0	0.0	0.0	0.000	0.000	0.000
NORTH SHORE LEAD PAINT TEST SERVICE	0.0	0.0	0.0	0.000	0.000	0.000
NORTH SHORE MEDICAL CENTER	0.0	0.0	0.0	0.000	0.000	0.000
NORTH SHORE MEDICAL CENTER-UNI. HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
NORTHEAST GENERATION SERVICES	0.0	0.8	0.8	0.000	0.717	0.717
NORTHEASTERN UNIVERSITY	32.1	20.0	52.1	0.001	0.000	0.002
NORWICH LABORATORIES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
NOVA CHEMICALS INCORPORATED	0.0	0.0	0.0	0.000	0.000	0.000
NOVARTIS INST. FOR BIOMEDICAL RESEARCH	181.0	85.0	266.0	0.145	0.051	0.196
NUCLEAR INSTRUMENT CO.	0.0	0.0	0.0	0.000	0.000	0.000
OMNIGENE BIOPRODUCTS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
OSCIENT PHARMACEUTICALS, INC.	1.0	0.0	1.0	0.000	0.000	0.000
OST SERVICES LLC	0.0	0.0	0.0	0.000	0.000	0.000
OXFORD INSTRUM. AMERICA, INC.	1.0	0.0	1.0	0.170	0.000	0.170
P.J. KEATING COMPANY, INC.	0.0	0.0	0.0	0.000	0.000	0.000
PALMER PAVING CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
PANAMETRICS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
PANTHER ENVIRONMENTAL	0.0	0.0	0.0	0.000	0.000	0.000
PARATEK PHARMACEUTICALS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
PARE ENGINEERING CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
PBS & J	0.0	0.0	0.0	0.000	0.000	0.000
PELLETIER, LEO H.	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
PENNONI ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
PEPTIMMUNE, INC.	36.0	0.0	36.0	0.002	0.000	0.002
PerkinElmer LIFE & ANALYTICAL SCIENCES, INC.	3,050.5	761.3	3,811.8	87.569	410.592	498.161
PerkinElmer OPTOELECTRONICS	0.0	0.0	0.0	0.000	0.000	0.000
PFIZER, INC.	97.5	118.2	215.7	0.020	0.024	0.045
PHARMA MAR USA, INCORPORATED	0.0	0.0	0.0	0.000	0.000	0.000
PHARMALOGIC P.E.T. SERVICES	0.0	0.0	0.0	0.000	0.000	0.000
PHOTODETECTION SYSTEMS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
PHOTOVAC, INC.	0.0	0.0	0.0	0.000	0.000	0.000
PHYLOGIX, INC	0.0	0.0	0.0	0.000	0.000	0.000
PINE & SWALLOW ASSOCIATES, INC	0.0	0.0	0.0	0.000	0.000	0.000
PIONEER VALLEY CARDIOLOGY, PC	0.0	0.0	0.0	0.000	0.000	0.000
PK ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
PLEXUS CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
PLYMOUTH RUBBER CO., INC.	0.0	0.0	0.0	0.000	0.000	0.000
POLAROID CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
PRAECIS PHARMACEUTICALS, INC.	120.0	0.0	120.0	0.051	0.000	0.051
PRIMA CARE, P.C.	0.0	0.0	0.0	0.000	0.000	0.000
PRIME ENGINEERING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
PROFESSIONAL SERV. INDUSTRIES	0.0	0.0	0.0	0.000	0.000	0.000
PROSCAN, INC.	0.0	0.0	0.0	0.000	0.000	0.000
PROTEIN FOREST, INC.	10.0	0.0	10.0	0.000	0.000	0.000
PROTZE CONSULTING ENGINEERS	0.0	0.0	0.0	0.000	0.000	0.000
QUALITY ASSURANCE LAB, INC.	0.0	0.0	0.0	0.000	0.000	0.000
QUEST DIAGNOSTICS LLC	0.0	0.0	0.0	0.000	0.000	0.000
QUINCY MEDICAL CENTER, INC.	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
QUINLAN, MICHAEL A.	0.0	0.0	0.0	0.000	0.000	0.000
R. P. HOLMES ENVIRONMENTAL	0.0	0.0	0.0	0.000	0.000	0.000
RADIATION MONITORING DEVICE, INC.	0.0	0.1	0.1	0.000	1.000	1.000
RADIOCAT	0.0	0.0	0.0	0.000	0.000	0.000
RADIOMED CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
RAYTHEON COMPANY	0.0	0.0	0.0	0.000	0.000	0.000
RCS LEAD PAINT DETECTION	0.0	0.0	0.0	0.000	0.000	0.000
READING CARDIOLOGY ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
REMSERV, INC.	0.0	0.0	0.0	0.000	0.000	0.000
REPLIGEN CORPORATION	0.0	3.0	3.0	0.000	0.000	0.000
RIVER BEND MEDICAL GROUP	0.0	0.0	0.0	0.000	0.000	0.000
RMD, INC., RMD INST., LLC	0.0	0.1	0.1	0.000	1.000	1.000
ROCKBESTOS-SUPRENANT	0.0	0.0	0.0	0.000	0.000	0.000
ROXBURY COMMUNITY COLLEGE	0.0	0.0	0.0	0.000	0.000	0.000
RSP ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
S.V. HOSPITAL, L.L.C.	1.4	0.0	1.4	0.231	0.000	0.231
SAINTS MEMORIAL MED. CENTER	0.0	0.0	0.0	0.000	0.000	0.000
SANBORN, HEAD & ASSOCIATES,	0.0	0.0	0.0	0.000	0.000	0.000
SCHEPENS EYE RESEARCH INST.	0.0	0.0	0.0	0.000	0.000	0.000
SCHERING-PLOUGH RESEARCH INSTITUTE	4.1	1.0	5.1	0.000	0.000	0.000
SEA CONSULTANTS	0.0	0.0	0.0	0.000	0.000	0.000
SELECTX PHARMACEUTICALS, INC.	0.0	3.0	3.0	0.000	0.001	0.001
SEQUEGEN, COMPANY	0.0	0.0	0.0	0.000	0.000	0.000
SERONO REPRODUCT.BIOLOGY INST.	0.0	37.5	37.5	0.000	0.032	0.032
SEVERN TRENT LABORATORIES, INC	0.0	0.0	0.0	0.000	0.000	0.000
SHARED DIAGNOSTIC SERVICES,INC	0.0	0.0	0.0	0.000	0.000	0.000
SHIELDS IMAGING OF MASS., LLC	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
SIEMENS MEDICAL SYSTEMS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
SIMMONS COLLEGE	12.0	1.5	13.5	0.004	0.001	0.005
SIONEX CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
SMITH AND WESSEL ASSOC. INC.	0.0	0.0	0.0	0.000	0.000	0.000
SMITH COLLEGE	0.0	0.4	0.4	0.000	0.001	0.001
SMITHSONIAN INSTITUTE	0.0	0.0	0.0	0.000	0.000	0.000
SOLUTIA, INC.	0.0	0.0	0.0	0.000	0.000	0.000
SOUTH SHORE CARDIOLOGY, P.C.	0.0	0.0	0.0	0.000	0.000	0.000
SOUTH SHORE HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
SOUTH SHORE LEAD PAINT TESTING	0.0	0.0	0.0	0.000	0.000	0.000
SOUTHCOAST HOSPITAL GROUP	0.7	0.0	0.7	0.000	0.000	0.000
SPAULDING REHAB HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
SPINCRAFT	0.0	0.0	0.0	0.000	0.000	0.000
SPRINGBORN SMITHERS LAB., INC.	87.3	29.2	116.5	0.015	0.071	0.086
SPRINGFIELD HOUSING AUTHORITY	0.0	0.0	0.0	0.000	0.000	0.000
SPRINGFIELD WATER & SEWER COMM	0.7	0.0	0.7	0.013	0.000	0.013
SPRUCE ENVIRONMENTAL TECHNOLOGIES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ST. ANNE'S HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
ST. ELIZABETH'S MEDICAL CENTER	0.0	12.0	12.0	0.000	0.007	0.007
ST. LUKE'S HOSPITAL	1.1	0.0	1.1	0.012	0.000	0.012
STARMET NMI	0.0	150.0	150.0	0.000	0.030	0.030
STERIS-ISOMEDIX SERVICES	0.0	0.0	0.0	0.000	0.000	0.000
STONE & WEBSTER, Inc.	0.0	0.0	0.0	0.000	0.000	0.000
STOWE WOODWARD, LLC	0.0	0.0	0.0	0.000	0.000	0.000
STURDY MEMORIAL HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
SUFFOLK UNIVERSITY	3.4	0.0	3.4	0.000	0.000	0.000
SUMMIT LTD.	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
SURFACE LOGIX, INC.	3.0	2.0	5.0	0.015	0.012	0.027
SYNTA PHARMACEUTICAS CORPORATION	0.0	6.5	6.5	0.000	0.001	0.001
SYNTONIX PHARMACEUTICALS, INC.	0.0	1.2	1.2	0.000	0.001	0.001
TECTONIC ENGINEERING CONSULTANTS	0.0	0.0	0.0	0.000	0.000	0.000
TEI BIOSCIENCES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
TGA SCIENCES INC.	0.0	0.0	0.0	0.000	0.000	0.000
THERION BIOLOGICS CORPORATION	0.0	9.0	9.0	0.000	0.110	0.110
THERMO ENVIRONMENTAL INSTRUMENTS	0.0	0.0	0.0	0.000	0.000	0.000
THESEUS IMAGING CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
THOMPSON & LICHTNER CO., INC.	0.0	0.0	0.0	0.000	0.000	0.000
THRASOS	0.0	0.0	0.0	0.000	0.000	0.000
TIAX LLC	0.0	0.2	0.2	0.000	0.000	0.000
TOBEY HOSPITAL, INC.	0.7	0.0	0.7	0.000	0.000	0.000
TOLAN, RICHARD E.	0.0	0.0	0.0	0.000	0.000	0.000
TOLERRX, INC.	22.5	7.5	30.0	0.001	0.000	0.002
TOXIKON CORPORATION	0.0	371.0	371.0	0.000	0.011	0.011
TRANSFORM PHARMACEUTICALS,INC	0.0	0.0	0.0	0.000	0.000	0.000
TRANSKARYOTIC THERAPIES, INC.	34.1	30.7	64.8	0.001	0.007	0.009
TRANXENOGEN, INC.	0.0	0.0	0.0	0.000	0.000	0.000
TRC ENVIRONMENTAL CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
TRUESDALE CARDIOLOGY ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
TUFTS UNIVERSITY	0.0	7.5	7.5	0.000	0.006	0.006
TUFTS UNIVERSITY, SCH. OF MED.	118.3	56.1	174.4	0.516	0.499	1.015
TUFTS-NEW ENGLAND MEDICAL CENTER	73.5	24.4	97.9	0.112	0.066	0.178
TURBOCARE, INC.	0.0	0.0	0.0	0.000	0.000	0.000
TW ENVIRONMENTAL SERVICES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
TYCO SAFETY PRODUCTS WESTMINSTER	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
U.S. GENOMICS	0.0	0.0	0.0	0.000	0.000	0.000
UCB RESEARCH, INC.	15.0	0.0	15.0	0.001	0.000	0.001
UMASS MEMORIAL HEALTHALLIANCE LEOMINSTER	0.0	0.0	0.0	0.000	0.000	0.000
UMASS MEMORIAL/MARLBOROUGH HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
UMASS/MEMORIAL CLINICAL SYSTEMS	70.3	0.3	70.7	0.679	0.000	0.679
UNITECH SERVICES GROUP, INC.	173.0	122.0	295.0	0.013	0.007	0.020
UTS OF MASSACHUSETTS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
V.I. TECHNOLOGIES, INC.	73.4	0.0	73.4	0.027	0.000	0.027
VALLEY SAFETY SERVICES ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
VANASSE, HANGEN, BRUSTLIN, INC	0.0	0.0	0.0	0.000	0.000	0.000
VERTEX PHARMACEUTICALS, INC.	22.5	20.6	43.1	0.003	0.001	0.004
VIACELL, INC.	0.0	0.0	0.0	0.000	0.000	0.000
VISEN MEDICAL, INC.	0.0	0.0	0.0	0.000	0.000	0.000
WALSH, JOHN	0.0	0.0	0.0	0.000	0.000	0.000
WAMPANOAG TRIBE OF AQUINNAH	0.0	0.0	0.0	0.000	0.000	0.000
WARATAH PHARMACEUTICALS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
WARNER BROS., INC.	0.0	0.0	0.0	0.000	0.000	0.000
WELLESLEY COLLEGE	15.0	2.0	17.0	0.003	0.001	0.004
WESTON & SAMPSON ENGINEERS, I	0.0	0.0	0.0	0.000	0.000	0.000
WESTON SOLUTIONS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
WHITEHEAD INST. FOR BIOMED RES	67.5	45.0	112.5	0.011	0.004	0.015
WILLIAM C. FINN ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
WILLIAM F. SULLIVAN & COMPANY, INC.	0.0	0.0	0.0	0.000	0.000	0.000
WILLIAMS COLLEGE	0.0	0.0	0.0	0.000	0.000	0.000
WINCHESTER HOSPITAL	0.7	0.0	0.7	0.000	0.000	0.000
WING MEMORIAL HOSPITAL CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
WOODARD & CURRAN, INC.	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
WOODS HOLE OCEANOGRAPHIC INSTITUTION	78.0	27.0	105.0	0.003	0.004	0.007
WORCESTER DEPT. OF HEALTH	0.0	0.0	0.0	0.000	0.000	0.000
WORCESTER POLYTECHNIC INST.	5.0	10.0	15.0	0.000	0.003	0.003
WORCESTER, PUBLIC WORKS	0.0	0.0	0.0	0.000	0.000	0.000
WTE RECYCLING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
XRF CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
YANKEE ATOMIC ELECTRIC COMPANY	191,901.6	0.0	191,901.6	24.470	0.000	24.470
YANKEE ENG. & TESTING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
YEE CONSULTING GROUP, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GRAND TOTALS:	**222,996.4**	**5,080.5**	**228,086.9**	**229.266**	**6,121.216**	**6,350.482**

Figure 29
Commonwealth of Massachusetts
DPH Radiation Control Program
Calendar Year (CY) 2004 Radioactive Waste Survey

Part One : General Information

Licensee Name	
Radiation Safety Officer	
Street Address	
City / State / Zip Code	/ /
E-Mail Address	
Radioactive Materials License Number	__ __ - __ __ __ __
Person Completing Survey / Title	/
Telephone / Telefax	/
Certifying Official / Title	/
Signature / Telephone	/
Date of Survey Completion	

	YES	NO
In 2004, did you generate any low level radioactive waste (LLRW) **with a half-life greater than 120 days**?		
In 2004, did you transfer any licensed material for disposal at a licensed low-level radioactive waste disposal facility?		
Did your organization have any long-lived radioactive waste requiring disposal in storage either on or off site on 12/31/04?		

If you answered YES to any of the above questions complete all applicable sections of Part Two. If you answered NO to all questions, STOP HERE and return this form.

Return Address:

Massachusetts DPH Radiation Control Program
90 Washington Street
Dorchester, MA 02121
ATT: Fred Barker Fax 617- 427- 2925
FRED.BARKER@STATE.MA.US E-MAIL ADDRESS
Please return this survey by March 1, 2005 by mail or fax

License # __ __ - __ __ __ __

Commonwealth of Massachusetts DPH Radiation Control Program
CY 2004 Radioactive Waste Survey

Part Two : Waste Generation, Storage and Disposal Information

Section A : Radioactive Waste Generated in Calendar Year 2004

Class A (other than HVLA*)	Transferred for Disposal in CY 2004	In Storage as of 12/31/04	Total
Volume, ft3			
Activity, curies			
Principal Isotopes			

Class B (other than HVLA*)	Transferred for Disposal in CY 2004	In Storage as of 12/31/04	Total
Volume, ft3			
Activity, curies			
Principal Isotopes			

Class C (other than HVLA*)	Transferred for Disposal in CY 2004	In Storage as of 12/31/04	Total
Volume, ft3			
Activity, curies			
Principal Isotopes			

High Volume, Low Activity Waste	Transferred for Disposal in CY 2004	In Storage as of 12/31/04	Total
Volume, ft3			
Activity, curies			
Principal Isotopes			

License # ____-__ ____ __ __ __

Commonwealth of Massachusetts DPH Radiation Control Program
CY 2004 Radioactive Waste Survey

Part Two : Waste Generation, Storage and Disposal Information

Section B : Radioactive Waste Generated Prior to Calendar Year 2004
That Requires Disposal AND Was Not Reported on Previous Surveys

	Transferred for Disposal in CY 2004	In Storage as of 12/31/04	Total
Calendar Year(s) of Generation			XXXXXXXXXXXXX XXXXXXXXXXXXX
Class (A, B, C or HVLA)			
Volume, ft3			
Activity, curies			
Principal Isotopes			

Part Three : Waste Minimization Statement / Plan

Has your waste minimization statement or plan, which is on file with the Massachusetts DPH Radiation Control Program, changed since last year? If you answered YES, please include your updated statement and/or plan with this survey.	YES	NO

Many pertinent 105 CMR 120 regulations may be found on the Massachusetts DPH Radiation Control Program's web page at www.state.ma.us/dph/rcp including Class A, B, and C definitions in section 105 CMR 120.299.

High Volume, Low Activity Waste. Definition - Soils, demolition rubble or other LLRW that has average concentrations of radioactive material less than or equal to the concentrations set forth in 345 CMR 1.13, Table 1.13B, and has been or would be accepted by a licensed low-level radioactive waste disposal facility.

If you need assistance completing this survey, please contact the Radiation Control Program staff at (617) 427-2944 x 2047, att: Fred Barker.