State of Illinois
Illinois Emergency Management Agency

2010 Annual Survey Report

IEMA

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Preface

The Illinois Low-Level Radioactive Waste Management Act mandates an annual survey of all low-level radioactive waste (LLRW) generators in Illinois. The Illinois Emergency Management Agency (IEMA) requires all LLRW generators to complete a questionnaire and provide:

1. The types and quantities of LLRW that was either shipped for disposal or stored on-site;
2. How LLRW is being managed (i.e. treatment); and
3. What management alternatives a generator might use in the future.

This is the 27th report based on the response to those surveys.

Please note that where possible International System of Units (SI) are included in parentheses behind English units. Annual Reports are available for the years 1984 through 2010. Comments on this report and suggestions for preparing future reports are welcome and should be addressed to:

Manager, LLRW and Decommissioning Section
Bureau of Environmental Safety
Illinois Emergency Management Agency
1035 Outer Park Drive
Springfield, IL 62704

Additional information about LLRW is also available by writing to the address above and through IEMA's website: http://iema.illinois.gov/iema/publications/publications.asp.

Conversion Factors

Multiply English Unit	by	To obtain SI unit
Cubic Foot (ft^3)	0.02832	Cubic Meter (m^3)
Millicurie (mCi)	37	Megabecquerel (MBq)
Curie (Ci)	37	Gigabecquerel (GBq)

1 millicurie = 0.001 curie
1 megabecquerel = 1,000,000 becquerels
1 gigabecquerel = 1,000,000,000 becquerels
1 terabecquerel = 1,000,000,000,000 becquerels

Introduction

The Illinois Low-Level Radioactive Waste Management Act (Management Act) requires all low-level radioactive waste (LLRW) generators to submit annual reports detailing classes, quantities and types of LLRW possessed, generated, treated or shipped for treatment, storage or disposal. This report contains a summary of the generator's responses to the 2010 annual survey. LLRW will be referred to in terms of volume, radioactivity and half-life.

Low-level radioactive waste is defined in the Management Act as:

> "Low-level radioactive waste" or "waste" means radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel or byproduct material as defined in Section 11e(2) of the Atomic Energy Act of 1954 (42 U.S.C. 2015).

Generators of LLRW include nuclear power stations, hospitals, universities and industrial companies.

Onsite Waste Management

Some LLRW generators perform onsite waste management. Techniques include decontamination, volume reduction, decay in storage (for short half-life radionuclides), and disposal in the sanitary drain (for select radionuclides at low concentrations). The results of the onsite management is a reduced volume of waste requiring offsite treatment or disposal, a more stable waste form and a reduction in waste management related expenses.

Offsite Waste Management

The majority of waste treatment occurs at offsite waste management facilities. Small waste generators typically use the services of a waste broker who collects their waste and takes it either to their facility for consolidation with other generator's waste or to a facility for treatment or disposal. Large generators usually have sufficient volumes of waste to make shipment direct to a treatment or disposal facility.

Offsite treatment varies depending on the waste type. Determining the appropriate treatment is a balance between the cost of processing and the cost of disposal. For components or other re-useable items, the salvage value of the item is also considered. There are several treatment facilities that offer a variety of waste processing services, including:

- Segregation and sorting
- Compaction
- Incineration
- Decontamination
- Thermal destruction
- Encapsulation
- Solidification and stabilization
- Metal melt
- Size reduction
- Repackaging

Waste processing results in a more stable waste form and a reduced volume of waste requiring disposal.

Available Disposal Capacity

Disposal capacity became limited effective on July 1, 2008 when South Carolina no longer authorized importation for purposes of disposal at their Barnwell site. "Importation," for these purposes, means the acceptance at the regional disposal facility of any waste that was generated in any foreign country or any state or territory of the U.S. other than Connecticut, New Jersey, and South Carolina.

Illinois generators can dispose of waste at The Energy*Solutions*' Clive, UT facility which accepts most Class A waste types. Waste considered to be naturally occurring radioactive material (NORM) can be disposed at the US Ecology Richland, WA disposal facility or at several US EPA RCRA Subtitle C landfills (NORM material with lower concentrations). Currently there is no disposal facility for Class B and C waste generated in Illinois.

Annual Surveys

In compliance with the Management Act, the Illinois Emergency Management Agency (IEMA) conducts an annual survey of the LLRW generators located in Illinois and any broker or processor that handles Illinois LLRW within or outside of the state. Each generator provides IEMA with information by completing the generator's Annual Survey about the types, quantities and activity of LLRW generated, stored, treated and disposed of and future LLRW shipment projections. Brokers and processors provide information regarding any and all Illinois waste received, treated, processed and shipped for disposal by completing the Brokers' and Processors' Annual Survey.

LLRW Tracking System

IEMA operates a system to administratively track shipments of LLRW that have a point of origination or destination in the state of Illinois. Persons who ship LLRW into, out of or within the state must obtain a permit from IEMA and report shipment information electronically to the Tracking System. Brokers can provide the EDT files on behalf of their generator customers. IEMA provides the information collected by the Tracking System back to the generators in the form of completed annual survey tables for generator verification.

Conclusion and Observations from the 2010 Annual Survey

Illinois LLRW generation in 2010 continued to demonstrate the typical variation in year to year production. The waste volume decreased slightly from 2009; however the activity increased significantly from the previous year. The number of generators decreased from 2009 to 2010 with a decline of 14 generators. However, the number of generators who shipped waste continued the steady decline since 2000.

In 2010 the large volume generators were a fuel cycle facility that performed major cleanup activities and the nuclear power stations (reactor generators).

Chapter Two

2010 Annual Survey Results

There were 441 LLRW generators in Illinois during 2010, a decrease of 14 from the previous year. Table 1 provides a summary of the number of generators in each of the categories. A description of each of the generator categories is provided below. The category with the largest number of generators is Medical with 319. LLRW generators are distributed throughout Illinois with the largest concentration in the Chicago metropolitan region. Table 2 provides a summary of the volume and activity of LLRW produced by each generator category.

Table 1 – Illinois LLRW Generator Survey Response by Generator Category 2004 – 2010

Generator Category	2004	2005	2006	2007	2008	2009	2010
Academic	36	35	32	33	35	33	33
Fuel Cycle	2	2	2	2	2	2	2
Governmental	22	22	18	18	19	18	15
Industrial	80	74	81	71	66	66	65
Medical	295	311	318	326	327	329	319
Reactor	7	7	7	7	7	7	7
Total	442	451	458	457	456	455	441

Table 2 – 2010 Volume and Activity by Generator Category

Generator Category	Volume (ft^3)	Volume (m^3)	Activity (Ci)	Activity (GBq)
Academic	702.8	19.9	0.6	23.3
Fuel-Cycle	187,166.5	5300.6	8.6	320.0
Governmental	620.4	17.6	0.6	23.8
Industrial	11,295.5	319.9	19.9	738.1
Medical	154.9	4.4	0.1	1.9
Reactor	270,392.6	7,657.5	1,911.4	70,721.4
Totals	470,332.6	13,319.8	1,991.4	73,680.8

The following pages detail the responses received to the 2010 Annual Survey. The responses have been consolidated by generator category.

Academic Category –

- Includes LLRW generated at high schools, colleges, universities and associated research facilities.
- 10 of 33 generators shipped in 2010
- A decrease in both waste volume and activity from the previous year, with both values below the historical range

Table 3 – 2004 – 2010 Academic Generator Shipment Summary

Year	2004	2005	2006	2007	2008	2009	2010
# of generators	36	35	32	33	35	33	33
# of shippers	11	11	9	9	12	11	10
Volume (ft^3)	892	1,828	1,096	962	2,380	911	703
Volume (m^3)	25	52	31	28	67	26	20
Activity (mCi)	5,085	20,170	2,089	5,096	1,003	2,528	628
Activity (MBq)	188,145	746,290	77,293	188,552	37,111	93,526	23,262

Table 4 – 2010 Academic Generators Shipping LLRW for Processing or Disposal

Academic Generator	Volume		Activity	
	(ft^3)	(m^3)	(mCi)	(MBq)
ASTELLAS Research Institute of America	45.9	1.3	21.7	803.4
College of Lake County	1.4	<0.1	2.0	74.0
IIT Research Institute	1.4	<0.1	43.8	1,620.7
Kaskaskia College	4.5	0.1	8.1	298.1
Loyola University of Chicago	9.8	0.3	0.5	16.9
Northwestern University	188.0	5.3	227.6	8,420.1
Oakton Community College	1.4	<0.1	<0.1	0.1
Prairie State College	1.4	<0.1	<0.1	<0.1
SIU - Carbondale	122.0	3.5	15.7	581.6
The University of Chicago	327.0	9.3	309.4	11,447.8
Total	702.8	19.9	628.7	23,262.7

Fuel Cycle Category

- Includes LLRW generators whose operations are part of the nuclear fuel cycle
- Both fuel cycle generators shipped this year
- An decrease in waste volume from the previous year
- An increase in activity generation from the previous year

Table 5 – 2004 – 2010 Fuel Cycle Generator Shipment Summary

Year	2004	2005	2006	2007	2008	2009	2010
# of generators	2	2	2	2	2	2	2
# of shippers	1	1	2	1	1	2	2
Volume (ft^3)	8,997	36,576	468,831	37,391	210,426	225,614	187,167
Volume (m^3)	255	1,036	13,277	1,059	5,959	6,389	5,301
Activity (mCi)	3328	273	80,203	400	2,248	5,175	8,648
Activity (MBq)	12,136	10,101	2,967,511	14,800	83,176	191,465	319,969

Table 6 – 2010 Fuel Cycle Generators Shipping LLRW for Processing or Disposal

Fuel Cycle Generator	Volume		Activity	
	(ft^3)	(m^3)	(mCi)	(MBq)
GE Hitachi Nuclear Energy	12,644	358	5,849	216,415
Honeywell International Inc.	174,523	4,942	2,799	103,555
Total	187,167	5,301	8,648	319,969

Governmental Category

- Includes LLRW generated by city, state and federal governmental entities (including VA hospitals)
- 1 of 15 generators shipped in 2010
- A significant increase in volume from last year and the highest since 2004
- A significant increase in activity from the previous year

Table 7 – 2004 – 2010 Governmental Generator Shipment Summary

Year	2004	2005	2006	2007	2008	2009	2010
# of generators	22	22	18	18	19	18	15
# of shippers	4	5	3	4	4	2	1
Volume (ft^3)	759	561	262	154	191	30	620
Volume (m^3)	21	16	7	4	6	1	17.6
Activity (mCi)	1,534	12,244	65	5,498	335	1.1	644
Activity (MBq)	56,758	453,028	2,405	203,426	12,395	38.9	23,823

Table 8 – 2010 Governmental Generators Shipping LLRW for Processing or Disposal

Governmental Generator	Volume		Activity	
	(ft^3)	(m^3)	(mCi)	(MBq)
U.S. Department of the Army	620	17.6	644	23,823
Total	620	17.6	644	23,823

Industrial Category

- Includes LLRW generated by private entities that provide products or services to the private and public sectors
- 15 of 65 generators shipped in 2010
- A significant decrease in waste volume and activity from the previous year

Table 9 – 2004 – 2010 Industrial Generator Shipment Summary

Year	2004	2005	2006	2007	2008	2009	2010
# of generators	80	74	81	71	66	66	65
# of shippers	26	19	24	15	17	17	15
Volume (ft^3)	10,544	19,776	21,940	6,194	10,072	24,865	11,295
Volume (m^3)	299	560	621	176	285	704	320
Activity (Ci)	102	11	4	138	46	41	20
Activity (GBq)	3,774	407	148	5,140	1,705	1,515	738

Please note the units for activity are in Curies and giga-Becquerels.
1 Ci = 1,000 mCi; 1 GBq = 1,000 MBq

Table 10 – 2010 Industrial Generators Shipping LLRW for Processing or Disposal

Industrial Generator	Volume		Activity	
	(ft^3)	(m^3)	(mCi)	(MBq)
Abbott Laboratories	581.3	16.5	3,503.4	129,626.1
APL Engineered Materials, Inc.	8.0	0.2	<0.1	0.1
Aqua-America	427.5	12.1	10.2	378.2
Crown Cork and Seal	1.4	<0.1	<0.1	1.2
Dunlee	1.4	<0.1	<0.1	0.7
EPL Bio-Analytical Services, Inc.	68.9	2.0	2.5	93.3
GE Healthcare	924.0	26.2	14,785.8	547,074.5
General Dynamics	500.0	14.2	2.9	107.7
Kraft Foods Global, Inc.	5.6	0.2	0.1	4.6
O'Brien Gear	289.5	8.2	2.7	100.2
Richardson Electronics, LTD	0.1	<0.1	300.1	11,103.4
SGS North America	6.2	0.2	2.7	100.2
Trace Photonics	80.6	2.3	77.2	2,854.9
Unitech Services Group, Inc.	7,225.0	204.6	1,245.6	46,087.4
Water Remediation Technology, LLC	1,176.0	33.3	15.9	588.3
Total	11,295.5	319.9	19,949.2	738,120.6

Medical Category

- Includes LLRW generated by hospitals, medical centers, clinics, laboratories and private medical offices
- 7 of the 319 medical generators shipped waste during 2010
- The majority of medical generators don't generate waste that requires offsite management
- The waste volume and activity decreased slightly from the previous year

Table 11 – 2004 – 2010 Medical Generator Shipment Summary

Year	2004	2005	2006	2007	2008	2009	2010
# of generators	295	311	318	326	327	329	319
# of shippers	4	10	4	4	16	8	7
Volume (ft^3)	89	165	729	405	217	226	208
Volume (m^3)	3	5	21	11	5	6	6
Activity (mCi)	14	1,341	22	894	4,530	62	50
Activity (MBq)	518	49,617	814	33,078	167,610	2,296	1,854

Table 12 – 2010 Medical Generators Shipping LLRW for Processing or Disposal

Medical Generator	Volume		Activity	
	(ft^3)	(m^3)	(mCi)	(MBq)
Contegra Northern IL Medical Center	15.0	0.4	10.0	370.0
Loyola University Medical Center	15.0	0.4	2.7	98.1
MEDA Pharmaceuticals	0.7	<0.1	2.3	85.5
Northern Illinois Medical Center	15.5	0.4	10.0	370.0
Northwestern Memorial Hospital	57.7	1.6	2.5	92.4
Rush-Presbyterian-St. Luke's Medical Center	43.0	1.2	18.7	690.2
Valent Biosciences Corporation	8.0	0.2	4.0	148.1
Total	154.9	4.4	50.1	1,854.3

Reactor Category

- Includes LLRW generated at the nuclear power stations
- 6 of the 7 generators shipped waste in 2010
- The waste volume and activity increased in 2010 which will vary substantially depending on the number of stations conducting refueling outages or other maintenance activities

Table 13 – 2004 – 2010 Reactor Generator Shipment Summary

Year	2004	2005	2006	2007	2008	2009	2010
# of generators	7	7	7	7	7	7	7
# of shippers	6	6	6	7	7	6	6
Volume (ft^3)	194,216	243,195	394,276	199,043	240,475	226,885	270,393
Volume (m^3)	5,500	6,887	11,166	5,637	6,810	6,425	7,658
Activity (Ci)	11,415	11,072	456,221	15,492	21,846	1,261	1,911
Activity (TBq)	422	410	16,880	573	808	46.7	70.7

Please note the SI units for activity are in TBq. 1 TBq = 1,000 GBq

Table 14 – 2010 Reactor Generators Shipping LLRW for Processing or Disposal

Reactor Generator	Volume		Activity	
	(ft^3)	(m^3)	(Ci)	(GBq)
Braidwood	20,640.4	584.5	34.1	1,261.1
Byron	14,356.9	406.6	28.9	1,070.2
Clinton	56,024.4	1,586.6	869.7	32,178.1
Dresden	53,238.6	1,507.7	403.3	14,923.9
LaSalle	53,746.6	1,522.1	66.7	2,469.2
Quad Cities	72,385.8	2,050.0	508.6	18,818.8
Total	270,392.6	7,657.5	1,911.4	70,721.4

Volume and Classes of LLRW Shipped Directly to Disposal Facilities, Brokers and Processors

The U.S. Nuclear Regulatory Commission (NRC) established a waste classification system (10 CFR 61) that is incorporated and defined in 32 Illinois Administrative Code 340.1052. These regulations define three classes of LLRW based on the radionuclide content and concentration: Class A, Class B and Class C. The greater the hazard, the greater the level of protection required for disposal. Waste that is classified as greater than Class C (GTCC) is not generally acceptable for land disposal and is the responsibility of the federal government.

Class A waste contains lower concentration of both short and long half-life radionuclides. Class B waste contains higher concentrations of short half-life radionuclides while Class C contains higher concentrations of long half-life radionuclides. Both Class B and C wastes must meet more stringent waste form and packaging requirements while Class C wastes must be disposed with an intruder barrier with an effective 500-year service life. The maximum concentrations of radioactivity are specified for waste so that the amount of radioactivity remaining at the end of 500 years does not pose any significant environmental health or safety hazard, even if someone intrudes into the waste.

Table 15 – Distribution by Class of LLRW Shipped by Generator Category in 2010

Generator Category	Class A Volume (ft^3)	Class A Volume (m^3)	Class B Volume (ft^3)	Class B Volume (m^3)	Class C Volume (ft^3)	Class C Volume (m^3)	Total Category Volume (ft^3)	Total Category Volume (m^3)
Academic	383.9	10.9					383.9	10.9
Fuel-Cycle	187,166.5	5300.6					187,166.5	5300.6
Governmental	620.4	17.6					620.4	17.6
Industrial	14,945.5	423.3					14,945.5	423.3
Medical	208.5	5.9					208.5	5.9
Reactor	270,392.6	7,657.5					270,392.6	7,657.5
Total	473,717.3	13,415.7					473,717.3	13,415.7

As can be seen in Table 15 above, only Class A waste was shipped for disposal or to a broker or processor. This is due to the fact that there is no disposal facility available for LLRW generators in Illinois for the disposal of Class B or C wastes. This may change in the future with the opening of a LLRW disposal facility in Texas and the development of processing techniques to treat Class B and C wastes.

Specific Waste

The NRC and Illinois have deregulated certain wastes in which the concentration of hydrogen-3 (tritium), carbon-14, or iodine-125 is so low they do not pose a significant radiation threat to public health and safety. This type of waste is defined in 32 Illinois Administrative Code 340.1050 as 'specific waste' (liquid scintillation fluids and animal carcasses) and may disposed of as non-radioactive waste. Some of these wastes contain non-radioactive hazardous materials, such as toxic chemicals, or consist of animal tissue that can become bio-hazardous as it decomposes. Most of these wastes are generated by university and medical research activities and are either diluted with sufficient volumes of water as defined in 32 Administrative Code 340.1050 and disposed of in the sanitary sewer, destroyed by incineration, or transferred to a hazardous waste disposal facility. In some cases, these wastes are shipped to LLRW disposal facilities despite their low radioactive content. In 2010, seventeen academic facilities, four governmental facilities, eight industrial facilities and twenty three medical facilities disposed of specific waste into sanitary sewerage.

LLRW Stored On-Site for Decay to Background Levels

One alternative Illinois generators have to shipping LLRW contaminated with short-lived radionuclides for disposal is to store the waste on-site until the radioactivity diminishes to levels that permit disposal as non-radioactive waste. Licensees may be authorized to store waste for

decay up to half-lives less than 120 days. However, depending upon the needs of the generator, authorization for extended periods is granted. LLRW in storage for decay is normally held for 10 half-lives, or until the radioactivity has diminished to background levels. The table below shows the radionuclides stored for decay by Illinois generators and the number of generators who stored waste for decay by generator category. Fuel-cycle and reactor generators do not store waste for decay.

Table 16 – Radionuclides Held for Decay in 2010

Radionuclide	Half-Life		Academic	Governmental	Industrial	Medical	Total
Ag-108	2.4	Minutes	1				1
Ar-41	1.83	Hours			1		1
Au-198	64.8	Hours				1	1
Ba-139	83.1	Minutes			1		1
Br-82	35.34	Hours			1		1
Cl-38	37.29	Minutes			1		1
Cr-51	27.7	Days			2	3	5
Cs-131	9.7	Days				1	1
Cs-138	32.2	Minutes			1		1
F-18	109.7	Minutes			4	31	35
Ga-67	3.3	Days		2	5	103	110
I-123	13.2	Hours		2	5	106	113
I-125	60.1	Days	1			24	25
I-131	8	Days			7	93	100
I-135	6.68	Hours			1		1
In-111	2.8	Days			6	103	109
Ir-192	74	Days				1	1
K-42	12.4	Hours			1		1
Mn-56	2.58	Hours			1		1
Mo-99	66	Hours			2	1	3
P-32	14.3	Days	2		2	4	8
P-33	25.4	Days				2	2
Pd-103	17	Days				8	8
S-35	87.4	Days	1			2	3
Sb-122	67	Hours			1		1
Sm-153	47	Hours			3	21	24
Sr-82	25.36	Days				1	1
Sr-85	64.84	Days				1	1
Sr-89	50.6	Days			4	21	25
Sr-91	9.67	Hours			1		1
Sr-92	2.71	Hours			1		1
Tc-99m	6	Hours	3	3	8	309	323
Tl-201	73.1	Hours		2	5	224	231
Xe-123	2.14	Hours				1	1
Xe-133	5.2	Days		2	4	74	80
Y-90	64.1	Hours	1		3	9	13

Mixed Waste

LLRW that also meets the U.S. Environmental Protection Agency's criteria as hazardous waste is called "mixed waste." Some mixed waste is treated based on the hazardous component only,

such as the organic fluids which are generally used as a secondary fuel source. Other mixed waste is treated to eliminate or stabilize the hazard prior to disposal. Some mixed waste is treated and disposed using the U.S. EPA's mixed waste exemption where the hazardous component is not considered as long as the waste is being managed in accordance with the radioactive hazard.

Table 17 – Types of Mixed waste Stored On-Site at the end of 2010

Waste Type	Volume (ft^3)	Volume (m^3)	Radionuclides
Chromium			
corrosion-inhibiting chromates	15	0.4	U-Nat
Metals			
Mercury	4	0.1	Co-60
Scintillation Fluids			
Toluene	58.2	1.6	C-14, H-3
Xylene	18	0.5	C-14, Cs-134, Cs-137, H-3, Mn-54
Solvents & Other Organic Fluids	60.6	1.7	C-14, Co-57, Co-58, Co-60, Cs-137, H-3, Mn-54, U-Nat
Alkaline Liquids	37.5	1.1	Co-60
Other	45.5	1.3	Co-60
Total	238.8	6.7	

Chapter Three

Waste Projections

The 2010 Annual Survey required the generators to project the amount of LLRW they expect to produce or possess between 2011 and 2017. This information is used by the Agency for determining the development timeframe for a regional disposal facility or the need for an interim storage facility. Past history has indicated that the non-reactor generators underestimate volumes and activities by three to four times what was actually generated and disposed.

The projections are presented in both English and SI units for volume and activity.

Table 18 – LLRW Volume Projections (ft^3)
2011 - 2017

Year	2011	2012	2013	2014	2015	2016	2017
Academic	373	373	373	373	373	373	373
Fuel Cycle	650	650	650	650	650	650	650
Governmental	2	2	2	2	2	2	2
Industrial	10,132	10,132	10,132	10,132	10,132	10,132	10,132
Medical	601	601	601	601	601	601	601
Reactor	241,545	241,545	241,545	241,545	241,545	241,545	241,545
Total	253,302	253,302	253,302	253,302	253,302	253,302	253,302

Table 19 – LLRW Volume Projections (m^3)
2011 - 2017

Year	2011	2012	2013	2014	2015	2016	2017
Academic	11	11	11	11	11	11	11
Fuel Cycle	18	18	18	18	18	18	18
Governmental	0	0	0	0	0	0	0
Industrial	287	287	287	287	287	287	287
Medical	17	17	17	17	17	17	17
Reactor	6,841	6,841	6,841	6,841	6,841	6,841	6,841
Total	7,174	7,174	7,174	7,174	7,174	7,174	7,174

Table 20 – LLRW Activity Projections (Ci)
2011 - 2017

Year	2011	2012	2013	2014	2015	2016	2017
Academic	0	0	0	0	0	0	0
Fuel Cycle	120	120	120	120	120	120	120
Governmental	0	0	0	0	0	0	0
Industrial	262	262	262	262	262	262	262
Medical	0	0	0	0	0	0	0
Reactor	95,799	95,799	95,799	95,799	95,799	95,799	95,799
Total	96,181	96,181	96,181	96,181	96,181	96,181	96,181

Table 21 – LLRW Activity Projections (GBq)
2011 - 2017

Year	2011	2012	2013	2014	2015	2016	2017
Academic	7	1	1	1	1	1	1
Fuel Cycle	4,446	6	6	6	6	4,446	6
Governmental	0	0	0	0	0	0	0
Industrial	9,693	158	158	158	158	158	158
Medical	2	2	2	2	2	2	2
Reactor	3,544,545	3,560,702	3,550,117	3,625,520	3,549,837	3,545,803	2,447,635
Total	3,558,691	3,560,869	3,550,283	3,625,687	3,550,003	3,550,409	2,447,802

Mixed Waste Projections

The 2010 Annual Survey asked generators to project the volume and activity of mixed waste they thought they would produce between 2011 and 2017. The following tables provide a summary of the generators' projections. Tables are presented for volume and activity in both English and SI units.

Table 22 – Mixed Waste Volume Projections (ft^3) by Generator Category
2011 - 2017

Year	2011	2012	2013	2014	2015	2016	2017
Academic	200	200	200	200	200	200	200
Fuel Cycle	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0
Industrial	2	2	2	2	2	2	2
Medical	0	0	0	0	0	0	0
Reactor	8	8	8	8	8	8	8
Total	210	210	210	210	210	210	210

Table 23 – Mixed Waste Volume Projections (m^3) by Generator Category
2011 - 2017

Year	2011	2012	2013	2014	2015	2016	2017
Academic	6	6	6	6	6	6	6
Fuel Cycle	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0
Industrial	<1	<1	<1	<1	<1	<1	<1
Medical	0	0	0	0	0	0	0
Reactor	<1	<1	<1	<1	<1	<1	<1
Total	6	6	6	6	6	6	6

Table 24 – Mixed Waste Activity Projections (mCi) by Generator Category
2011 - 2017

Year	2011	2012	2013	2014	2015	2016	2017
Academic	30	30	30	30	30	30	30
Fuel Cycle	0	0	0	0	0	0	0
Government	1	1	1	1	1	1	1
Industrial	3	3	3	3	3	3	3
Medical	1	1	1	1	1	1	1
Reactor	4	4	4	4	4	4	4
Total	39	39	39	39	39	39	39

Table 25 – Mixed Waste Volume Projections (GBq) by Generator Category
2011 - 2017

Year	2011	2012	2013	2014	2015	2016	2017
Academic	1,110	1,110	1,110	1,110	1,110	1,110	1,110
Fuel Cycle	0	0	0	0	0	0	0
Government	37	37	37	37	37	37	37
Industrial	93	93	93	93	93	93	93
Medical	37	37	37	37	37	37	37
Reactor	148	148	148	148	148	148	148
Total	1,425	1,425	1,425	1,425	1,425	1,425	1,425