

# **Low-Level Radioactive Waste Management in North Carolina**

SUBMITTED TO THE  
**North Carolina General Assembly**

BY THE  
**North Carolina Radiation Protection Commission**

**April 2008**

<b>Executive Summary</b>	<b>2</b>
<b>Current Status of LLRW Disposal Facilities</b>	<b>2-3</b>
<b>Current Status of LLRW Management and Activities Undertaken by the NC Radiation Protection Section</b>	<b>3</b>
<b>Lessons Learned from 1995-2000 LLRW Storage</b>	<b>4</b>
<b>North Carolina and Southeast Compact Commission Issues</b>	<b>5</b>

## *Appendices*

<b>A. Strategic Assessment of LLRW Regulatory Program by the Nuclear Regulatory Commission (SECY-07-0180)</b>	<b>6</b>
<b>B. 2006 LLRW Annual Survey Report</b>	<b>7</b>
<b>C. Session Law 1999-357 – An Act Withdrawing North Carolina from the Southeast Interstate LLRW Management Compact</b>	<b>8</b>
<b>D. List of Members on the North Carolina Radiation Protection Commission &amp; the Low-Level Radioactive Waste Management Committee</b>	<b>9</b>

## **Executive Summary**

Based on the scheduled closure of Barnwell to out of compact generators including North Carolina on June 30, 2008, it may be necessary for a small number of North Carolina LLRW generators to develop long term on-site storage contingency plans for dealing with their Class B & C LLRW after June 30, 2008. This also applies to licensees needing to dispose of sealed sources.

NC facilities were successful in on-site storage of Class B and C LLRW and sealed sources during a five year period (1995-2000) of not having Barnwell as a disposal option. However, this was prior to 9/11/2001. Therefore, with new security concerns, NC facilities must address heightened security measures regarding storage of these materials.

### **Current Status of LLRW Disposal Facilities**

North Carolina LLRW generators currently have several options for the management of their LLRW. Processing facilities throughout the United States are currently accepting LLRW and using a variety of management techniques for processing. The two disposal facilities, Barnwell and Clive, are operated by EnergySolutions, LLC. North Carolina LLRW generators currently have access to these facilities for disposal of their LLRW.

#### **Barnwell, South Carolina**

The Barnwell Facility in South Carolina is currently available for disposal of commercially generated LLRW. At this time, the Barnwell site accepts Class A, B & C wastes and sealed sources for disposal. After June 30, 2008, the site will only accept waste from Atlantic Compact generators located in South Carolina, Connecticut and New Jersey. Under South Carolina law, the Barnwell facility has limited the total annual volume received at the site. The maximum LLRW disposal volume that Barnwell will be allowed to receive for fiscal year 2008 is 35,000 cubic feet. No LLRW from out-of-compact generators, including those in North Carolina will be received after June 30, 2008.

## **Clive, Utah**

The facility in Clive, Utah is licensed to accept Class A waste and uranium mill tailings for disposal. This Clive site can also accept some mixed waste within limits determined by specific activity and isotope. The Clive site does not accept Class B or Class C wastes, nor do they currently accept sealed sources for disposal. However, this site has requested state approval to accept sealed sources for disposal that meet Class A criterion.

### **Current Status of LLRW Management and Activities Undertaken by the NCRPS**

In preparation for the closure of the Barnwell facility, the Radioactive Materials Branch of RPS recently sent notification letters to all North Carolina radioactive material licensees alerting them of the scheduled closure of the Barnwell disposal facility. Also, an administrative license amendment was added to about 70 licensees that require them to submit an annual LLRW management report in March of each calendar year. These annual reports are combined into a final report for LLRW Management in North Carolina each calendar year to monitor any changes that have occurred and to assess the overall climate of generation, storage, management and disposal of LLRW in North Carolina. The NC Radioactive Materials Branch plays an active role through helping all NC LLRW generators with storage and management options, security issues and helping with the fostering of reduction of waste.

Currently, the RPS has 1,960 radioactive material licensees, which encompass a wide variety of different types of licenses. Although the total number of active North Carolina licensees generating LLRW is 67, each radioactive material licensee may at sometime have the need to dispose of their radioactive material as LLRW or transfer the material to a new licensed owner. Currently, there are 10 North Carolina facilities that are licensed by the Nuclear Regulatory Commission (NRC), a federal agency. Four of the LLRW generators in North Carolina disposed of Class B or C waste during 2006.

Based on the scheduled closure of Barnwell to out of compact generators including North Carolina in 2008, it may be necessary for North Carolina generators of Class B and C wastes to develop long term on-site storage contingency plans for dealing with that portion of their LLRW after June 30, 2008. Licensees needing to dispose of sealed sources may also need to utilize long term on-site storage after June 30, 2008.

## **Lessons Learned from 1995-2000 LLRW Storage**

One lesson learned during the closure of Barnwell was that many different types of LLRW were being generated throughout North Carolina. Most generators were using brokers to package their waste for shipment to out-of-state processing and/or disposal. LLRW generators stated that their existing management/processing/disposal options were sufficient for all of their LLRW with the exception of two types of waste, Class B & C waste. These generators were storing their Class B & C waste on-site awaiting disposal. The only disposal facility available to North Carolina generators for Class A waste at the time was Envirocare of Utah.

If access to out-of-state processing and disposal facilities were restricted, most generators would not be able to store their waste for very long before having to add more storage capacity. Some generators stated they could only store waste for several months before having to add more storage; however, others stated they could store indefinitely. Generators were questioned about their actions after South Carolina denied North Carolina generators access to the Barnwell, SC disposal facility, effective July 1995. Their actions included one or more of the following: changing radioactive material processes, minimizing waste, increasing storage capacity for LLRW, looking for other disposal options, employing volume reduction processes, buying waste compactors for on-site use and storing waste until another disposal option became available.

In summary:

- Between 1995 and 2000 the projected availability of facilities for the management of Class A waste was adequate as long as the generators continued to have access to the existing out-of-state processing and disposal facilities.
- There were four generators of Class B and C waste. They were able to safely store their waste without impact to public health and safety, as long as they continued to have access to the existing out-of-state processing facilities. However, these generators eventually would need a disposal option for their Class B and C waste.
- Approximately six radioactive material licensees who wanted to terminate their radioactive materials license were required to maintain their license for storage of their radioactive material or radioactive waste while waiting for a disposal option to become available.
- A majority of the generators stated that the compact system should be abandoned and the disposal market opened to the private industry.

## **North Carolina and Southeast Compact Commission Issues**

The Southeast Compact Commission, along with 4 member states, Alabama, Florida, Tennessee, and Virginia was granted leave to file a bill of complaint against North Carolina by the United States Supreme Court on June 16, 2003. The Supreme Court appointed Professor Bradford R. Clark of the George Washington University School of Law as its Special Master to consider the matters set forth in the Complaint. The Special Master issued a Preliminary Report on June 19, 2006 which recommended granting North Carolina's motion to dismiss the request for summary enforcement of the \$90 million monetary sanction imposed by the Southeast Compact Commission but allowing the remaining claims to proceed.

Since that time the parties have engaged in extensive discovery and have filed and briefed a second round of cross-motions for summary judgment focused on the questions of whether North Carolina breached the Southeast Compact by not licensing and constructing a waste disposal facility prior to withdrawing, and whether the Southeast Compact Commission and/or the member states have any non-contractual [equitable] basis for recovery of the monies provided by the Southeast Compact Commission to North Carolina in furtherance of North Carolina's siting and licensing efforts. The Special Master conducted a hearing in Washington, D.C. on the Motions for Summary Judgment in January 2008. He has taken the case under advisement and expects to request further briefing by the attorneys on points of law and issues to be addressed before he makes his decision.

## **Appendix A**

### **Strategic Assessment of LLRW Regulatory Program by the Nuclear Regulatory Commission (SECY-07-0180)**

**November 2, 2007**

The Nuclear Regulatory Commission has published the staff's strategic assessment of the agency's low-level radioactive waste (LLW) regulatory program, proposing several initiatives to meet impending challenges such as decreased disposal capacity and increased production of LLW as new reactors and other nuclear facilities come online.

Those challenges include the anticipated closure to most of the nation in 2008 of the Barnwell, S.C., LLW disposal facility. Barnwell is currently the nation's only commercial disposal option for certain wastes, and its closure could force licensees to store waste on-site until other disposal options become available. In addition, operation of new uranium enrichment facilities, potential nuclear fuel reprocessing facilities and commercial nuclear power plants will create additional demand for LLW disposal capacity.

The strategic assessment concludes that current NRC regulations on disposal of low-level radioactive waste fully protect the health and safety of workers and the public. However, the assessment identifies several measures that could improve the effectiveness of low-level waste management and regulation as disposal needs and circumstances change.

The strategic assessment identifies seven "high-priority" tasks the NRC intends to carry out to strengthen the agency's ability to ensure safe and secure LLW disposal, improve the effectiveness of its regulations, and assure regulatory stability and predictability while allowing flexibility in disposal options. These tasks include updating guidance for extended storage of LLW; developing new guidance for alternative disposal of low-activity waste; and developing guidance for classifying LLW according to the risk it poses to public health and safety.

The strategic assessment was developed with input from the NRC's Advisory Committee on Nuclear Waste and Materials as well as external stakeholders such as industry, state agencies, and public interest groups. It is currently before the Nuclear Regulatory Commission as an information paper (SECY-07-0180) and will be available on the NRC's Web site at this address: <http://www.nrc.gov/reading-rm/doc-collections/commission/secys/2007/>.

## Appendix B

### North Carolina Low-Level Radioactive Waste Management Report Calendar Year 2006

On June 30, 2008, the Barnwell, SC disposal facility will close its doors to North Carolina low-level radioactive waste (LLRW) generators. This closure will prompt on-site storage for Class B & C LLRW and the vast majority of unwanted radioactive material in the form of sealed sources. These specific wastes pose the greatest health risk due to higher radioactivity content and cause the greatest economic impact the longer disposal is not an option. In recognizing the importance of this closure, the Radiation Protection Section mandated that all North Carolina LLRW generators complete and submit an annual LLRW survey in order to evaluate this ever-changing landscape.

This 2006 report is based on survey responses from 67 North Carolina LLRW generators. Four of the LLRW generators in North Carolina disposed of Class B or C waste during 2006. It is difficult to draw conclusions, due to differing facility activities driving waste generation and disposal from year to year. The only definitive and intuitive conclusion based on the numbers is that Class B and C waste along with unwanted sealed sources will increase in accumulation in NC due to no disposal options.

The tables below offer a glimpse into North Carolina LLRW disposal history. Fortunately, NC has experience in a previous Barnwell closing from 1995-2000. The 1999 table demonstrates the effect of that closing which forced several facilities to develop on-site storage for Class B & C waste and sealed sources. The 2006 table demonstrates the effect of utilizing Barnwell as an option for disposal with very little waste being stored on-site at facilities.

<b>Calendar Year 1995</b> <i>Barnwell an Option</i>	<b>Calendar Year 1999</b> <i>Barnwell Not an Option</i>	<b>Calendar Year 2006</b> <i>Barnwell an Option</i>
<u>Total Disposal A,B,C waste</u> 25,244 ft <sup>3</sup> with 3,311 Curies  <b><i>Barnwell received &gt;99%.</i></b> <b><i>Envirocare was beginning to accept Class A waste.</i></b>  <u>Class B &amp; C Disposal</u> 569 ft <sup>3</sup> with 3,210 Curies  <u>Class B &amp; C in Storage</u> 152 ft <sup>3</sup> with 42 Curies	<u>Total Disposal A waste</u> 30,174 ft <sup>3</sup> with 112 Curies  <b><i>Barnwell received 0%.</i></b> <b><i>Envirocare received &gt;99%.</i></b>  <u>Class B &amp; C Disposal</u> 0  <u>Class B &amp; C in Storage</u> 1,257 ft <sup>3</sup> with 1,311 Curies	<u>Total Disposal A,B,C waste</u> 220,945 ft <sup>3</sup> with 97,045 Curies  <b><i>Barnwell received &lt;1 % of ft<sup>3</sup> and &gt;99% of Curies.</i></b> <b><i>Envirocare received &gt;99% ft<sup>3</sup></i></b>  <u>Class B &amp; C Disposal</u> 1,500 ft <sup>3</sup> with 96,500 Curies  <u>Class B &amp; C in Storage</u> 58 ft <sup>3</sup> with 2 Curies

### FACTS:

- ✓ On June 30, 2008, there will be no option for NC LLRW generators to dispose of Class B and C LLRW and most sealed sources.
- ✓ NC generators of Class B & C LLRW may need to create on-site long term storage options for these wastes.
- ✓ NC facilities engaged in long-term storage of Class B & C LLRW must address heightened security.
- ✓ The potential re-emergence of nuclear power in NC could generate an increased volume of LLRW including Class B & C LLRW.
- ✓ NC facilities were successful in on-site storage of Class B and C LLRW and sealed sources during a 5 year period of not having Barnwell as a disposal option. However, this was prior to 9/11/2001 and new security concerns.

## Appendix C

1999 Session S.L. 1999-357

GENERAL ASSEMBLY OF NORTH CAROLINA  
SESSION 1999

SESSION LAW 1999-357  
SENATE BILL 247

AN ACT TO WITHDRAW NORTH CAROLINA FROM THE SOUTHEAST INTERSTATE LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT COMPACT, TO LIMIT THE AUTHORITY OF THE LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT AUTHORITY AND TO DIRECT THE RADIATION PROTECTION COMMISSION TO STUDY AND FORMULATE A PLAN FOR LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT.

The General Assembly of North Carolina enacts:

Section 1. In accordance with the provisions of G.S. 104F-1, Article VII, Section (g) of the General Statutes, North Carolina hereby withdraws from membership as a party state in the Southeast Interstate Low-Level Radioactive Waste Management Compact.

Section 2. Chapter 104F of the General Statutes is repealed.

Section 3. Notwithstanding any provision of Chapter 104G of the General Statutes to the contrary, the sole function of the North Carolina Low-Level Radioactive Waste Management Authority shall be to take all necessary actions to complete the process of closure and restoration of the proposed Wake County low-level radioactive waste site, and to finalize all other responsibilities and business of the Authority relating to closure and restoration on or before June 30, 2000.

Section 4. Chapter 104G of the General Statutes is repealed effective July 1, 2000.

Section 5. The North Carolina Radiation Protection Commission is directed to review and study the current and projected availability and adequacy of facilities for the management of low-level radioactive waste produced by North Carolina generators, and to formulate a recommended plan for complying with North Carolina's responsibilities under the Low-Level Radioactive Waste Policy Act of 1980, Pub. L. No. 96-573, 94 Stat. 3347, and the Low-Level Radioactive Waste Policy Amendments Act of 1985, Pub. L. 99-240, 99 Stat. 1842, 42 U.S.C. 202 lb, et seq. The Commission shall report its findings and recommendations to the General Assembly on or before May 15, 2000. No license application for a low-level radioactive waste facility shall be issued or considered by the Department of Environment and Natural Resources prior to action by the General Assembly establishing a plan for future management of low-level radioactive waste.

Section 6. Sections 1, 2, 3, 5, and 6 of this act are effective when they become law. Section 4 of this act becomes effective July 1, 2000.

In the General Assembly read three times and ratified this the 20th day of July, 1999.

s/ Marc Basnight  
President Pro Tempore of the Senate

s/ James B. Black  
Speaker of the House of Representatives

s/ James B. Hunt, Jr.  
Governor

Approved 10:15 a.m. this 26<sup>th</sup> day of July, 1999

## Appendix D

### **North Carolina Radiation Protection Commission**

#### **Commission Members**

Wayne R. Thomann, Dr.P.H., Chairman  
Robert K. Andrews, Jr.  
Bernadine S. Ballance  
Charles Barry Burns, MSPH  
Rhonda S. Cohen, D.P.M.  
Holly J. Burge, M.D.  
Marion E. Deerhake  
Eugene A. Lewis, D.C., M.P.H.  
David J. DeMaster, Ph.D.  
Roy Ericson  
Anthony B. Bonapart  
Robert J. Fitzgerald  
Beverly O. Hall  
Larry E. Haynes, CHP  
Doug Hoell  
Chris G. Hoke  
John B. Ludlow, D.D.S.  
Allen M. Mabry, CHP  
Carmine M. Plott, Ph.D., CHP  
Daniel D. Sprau, Dr.P.H.  
Suzanne Taylor

#### **Commission Counsel**

Francis W. Crawley

#### **Commission Position**

Hospital Administrator  
Board of Transportation  
Industrial Commission  
Radiologic Technologist  
Podiatrist  
Physician, North Carolina Medical Society  
Environmental Management Commission  
North Carolina Chiropractic Association  
Faculty, Institution of Higher Learning  
Utilities Commission  
Department of Labor  
Medical Care Commission  
Radiation Protection Section  
Nuclear Electric Utility  
Division of Emergency Management  
Commission for Health Services  
Dentist, North Carolina Dental Society  
Atomic Energy, Other Than Power Generation  
Expert from the State-At-Large  
Environmental Protection  
Department of Insurance

Special Deputy Attorney General

### **Low-Level Radioactive Waste Management Committee**

Allen M. Mabry, CHP, Chairman	Representing Atomic Energy, Other than Power Generation
Marion E. Deerhake	Representing the Environmental Management Commission
David J. DeMaster, Ph.D.	Representing Faculty of Institution of Higher Learning
Beverly O. Hall	Section Chief of Radiation Protection Section
Larry E. Haynes, CHP	Representing Nuclear Electric Utility
Suzanne Taylor	Representing the Department of Insurance
Alan Call, Committee Resource	United States Environmental Protection Agency
Ken Ritchie, Committee Resource	Research Triangle Institute
Francis W. Crawley	Counsel to Committee
Wendy B. Tingle	Staff to Committee, Radioactive Waste Coordinator