



LOW-LEVEL WASTE ADVISORY COMMITTEE

DRAFT MINUTES

PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION LOW-LEVEL WASTE ADVISORY COMMITTEE (LLWAC) MEETING

September 26, 2025

Attendance

LLWAC Members, Alternates, and Legislative Staff

Marc Pawlowski (Chair), Constellation Energy Generation, LLC
Jesse Sloane (Vice Chair), Pennsylvania Society of Professional Engineers
Justina Wasicek, Sierra Club, Pennsylvania Chapter
Brian Lorah, Penn State College of Medicine
Lara Renz Paciello, University of Pittsburgh Graduate School of Public Health
Jeffrey Ivicic, PA Senate
Glendon King, PA House Republican Research Department, Executive Director
Aaron Wilmot, Pennsylvania State University
Ian Irvin, Executive Director of the Citizens Advisory Council at DEP
Matthew Osenbach, Alternate for Senator Yaw
Holly Fishel, Pennsylvania State Association of Township Supervisors
Alok Patnaik, PA State Association of Township Commissioners

Department of Environmental Protection (DEP) Staff

Dwight Shearer, Bureau of Radiation Protection (BRP)
David Baracco, BRP (BRP's LLWAC Liaison)
Kristina Hoffman, BRP
Stephanie Banning, BRP
Michael Karchner, BRP
Ryan Bankert, BRP
Bryan Werner, BRP
Derek Stahl, BRP
Troy Prutzman, BRP
Everette Whitlow, BRP
Eduardo Muro, BRP
Chad Duppstadt, BRP
Matthew Sims, BRP
Lindsay Williamson (Office of Chief Counsel)
Lauren Imgrund (Policy Office)
Jack Palumbo (Policy Office)

Others Present

Rich Janati, Administrator, Appalachian Compact Commission

Nate Eachus, Member of the Public

Jeff Cunningham, Member of the Public

Sarah Abdellatief, Member of the Public

Grant Gulibon, Pennsylvania Farm Bureau

Public Comment

There was no public comment.

Committee Business

Election of Officers

The LLWAC members voted unanimously to elect Marc Pawlowski as Chairperson and Jesse Sloan as Vice-Chairperson.

Approval of the Meeting Minutes

The LLWAC members voted unanimously to approve the September 27, 2024, minutes with minor corrections.

Next Annual Meeting

The committee decided to hold its next meeting on September 25, 2026, with an alternate date of October 3, 2026.

Status of LLRW Compacts and Update on Commercial LLRW Disposal Facilities

Mr. Baracco provided an update on the status of low-level radioactive waste (LLRW) compacts, commercial LLRW disposal facilities, and recent national developments involving management and disposal of LLRW.

There are currently four (4) commercial LLRW disposal facilities in the United States. These facilities are Barnwell in South Carolina; the EnergySolutions facility in Clive, Utah; the Richland facility in Washington; and the Waste Control Specialists (WCS) facility in Texas.

1. The Barnwell facility accepts all classes of LLRW from the three members of the Atlantic Compact (Connecticut, New Jersey, and South Carolina). As of July 1, 2008, this facility no longer accepts LLRW from outside the Atlantic Compact.
2. The Richland facility, located in the state of Washington, is a regional facility and accepts all classes of LLRW but only from the Northwest and Rocky Mountain Compacts.
3. The EnergySolutions Clive facility accepts Class A waste from all states except those in the Northwest and Rocky Mountain Compacts. The facility also provides for disposal of bulk

waste and large components such as steam generators and heat exchangers from nuclear power plants. This facility is not a regional facility and is regulated by the State of Utah. EnergySolutions is also seeking approval for license renewal for disposal of Class A waste, licensing of a federal cell, and an exempted waste cell. Those applications are ongoing with progress being made.

Mr. Baracco stated that EnergySolutions has received approval for disposal of Class A radioactive sealed sources. This is a significant development because large quantities of these sources are being stored on site by various generators. The approval of this request is positive news from a national security standpoint as it will provide an additional facility for disposal of this type of waste.

4. The WCS facility is a regional facility for the Texas Compact (Texas and Vermont) and accepts all classes of LLRW from both commercial and federal facilities. It is also capable of accepting containerized waste and large components. In April 2012, the Texas Commission on Environmental Quality authorized WCS to accept waste and begin disposal activities. Additionally, the Texas Compact Commission has established rules for the importation and exportation of LLRW into and out of the Texas region. The annual limit on radioactivity for out-of-compact waste is 275,000 Ci, but there is no annual limit on volume for out-of-compact waste. Disposal of large quantities of depleted uranium and Greater-Than-Class C waste is being considered by WCS.

The most recent development is that construction of a new cell has been completed, and it has added about 425,000 ft³ of capacity at the WCS facility. The license renewal application is under review, and they are currently making progress.

Review of Appalachian Compact LLRW Generation Information

Mr. Baracco provided background information on the US Department of Energy's (DOE) Manifest Information Management System (MIMS). MIMS contains information on LLRW disposal at the current commercial LLRW disposal facilities. Mr. Baracco said the Pennsylvania Department of Environmental Protection (DEP) has significantly reduced the regulated community's administrative LLRW reporting requirements by obtaining the appropriate disposal information from the MIMS database and directly from the commercial disposal facilities. However, this year the data was difficult to obtain due to personnel changes, staffing reductions, and retirements at DOE. The MIMS database had not been updated for the year 2024 until August of 2025 when Mr. Janati brought it to their attention.

Mr. Baracco discussed the waste disposal information for calendar year 2024. The Appalachian Compact disposed of 120,403 ft³ of LLRW, with 117,963 ft³, coming from Pennsylvania, 2,412 ft³ from Maryland, 14 ft³ from West Virginia, and 14 ft³ from Delaware. Most of Pennsylvania's waste was generated by the industry and nuclear utilities. Maryland's waste was mostly generated by industry, nuclear power plants, and the government. Most of the Class A waste generated within the compact was shipped to the EnergySolutions Clive Facility in Utah. One item to note is the 58,061 ft³ generated in the industry category last year for Pennsylvania. The majority of that was generated by Global Advanced Metals in Pennsylvania, who is a creator of tantalum products. Some of the byproducts from processing the ore include uranium and

thorium, which we determined was manifested for disposal as Class A waste. However, it was disposed of in a Resource Conservation and Recovery Act (RCRA) Type-C facility. This is considered source material and not Class A waste. MIMS did not have it listed as LLRW, and it also was not disposed of at a Part 61 facility. In the future, we may be excluding this from our reporting as it does not meet the definition of LLRW.

Mr. Janati stated that a large quantity of those materials contains uranium and thorium greater than 0.05 percent by weight. This material is considered source-term material and not necessarily LLRW. It was disposed of at the WCS facility in Texas at the RCRA Type-C facility. We have two options for reporting this quantity. One option is to include it in the low-level waste charts and tables but adding a note stating it is source-term material or the second option would be to exclude it from the low-level waste report but keep track of it separately, making sure that we have a record for future purposes in case we decide to include this material in our future disposal statistics. Mr. Janati's recommendation is to keep track of the amount that is disposed of as a source-term material but not include the low-level waste materials and report it as such. Mr. Janati plans to discuss this with EnergySolutions and WCS at the Forum meeting and to find out how these two facilities dispose of these materials and determine if there is any uniformity or not.

Mr. Baracco provided information on the radioactivity of waste disposed of in the compact. The compact generated about 681.8 Ci of waste. Pennsylvania generated about 592.9 Ci and Maryland generated about 84.9 Ci. Delaware generated 4 Ci and Virginia generated less than .1 Ci.

Mr. Baracco provided a brief discussion of radioactivity of waste for the period of 2004 through 2024. From the years 2004 through 2008, the activity level of waste being shipped was very high due to the availability of the Barnwell facility to our compact. The utilities shipped large quantities of highly irradiated core components as well as high radioactivity resins during that period. Then from the years 2009 through 2013 the activity level of waste included disposal only being available at EnergySolutions in Clive, Utah. The activity level of waste being shipped was very low due to the closure of the Barnwell facility. Lastly, from the years 2014 through 2024 the activity level of waste included low-level radioactive waste disposal at EnergySolutions in Clive, Utah and WCS in Andrews, Texas. With access to this facility the activity level of waste being shipped was very high due to the large quantities of high activity irradiated core components.

Mr. Baracco then presented a pie chart showing the total volume of materials disposed at WCS in 2024 was 66,748.9 ft³ or 55% percent of the total waste shipped. The total activity at EnergySolutions in 2024 was 53,654.9 or 45% of the total waste shipped. The total activity of materials disposed at EnergySolutions in 2024 was 559.1 Ci or 81% of the total activity. The total activity of materials disposed at WCS in 2024 was 112.6 Ci or 19% of the total activity.

Decommissioning of Nuclear Power Plants

Mr. Baracco then invited Mr. Stahl to present on the progress at Three Mile Island (TMI). The Crane Clean Energy Center was previously known as TMI Unit 1 and is owned by Constellation.

The fuel was removed in 2022, and the site was planned to remain in SAFESTOR until the year 2075 with the license terminating in 2079 and site restoration taking place in 2081. In 2024, it was announced that TMI Unit 1 was being renamed to Crane Clean Energy Center. The reactor would be reactivated in 2027, and Constellation is pursuing a license extension through 2054. The Nuclear Regulatory Commission (NRC) is planning to host public meetings every six months regarding the Crane Clean Energy Center and information is available on their website at this link: <https://www.nrc.gov/info-finder/reactors/ccec>.

Mr. Stahl then provided an update to the committee on the oversight activities of TMI-2. This presentation was from the viewpoint of BRP. We do not have regulatory authority over the cleanup site at TMI-2. That role stays with the NRC. However, in agreements that we have with the current owner, we receive updates on a day-to-day basis and participate in some of their committees as well as going over the cleanup. The overall authority that we have for a site like this is within the Radiation Protection Act (Act 147). We are required within Act 147 to provide a comprehensive environmental monitoring program around all operating plants while under decommissioning.

TMI-2, the site of the nuclear accident in 1979, is currently owned by TMI-2 Solutions. This is a subsidiary of EnergySolutions. They have partnered with a large contractor, JINGOLI, to help manage the decommissioning aspects. They aim at recovering any fuel-bearing material, higher-activity material that needs to be removed to produce source-term to make the long-term cleanup goals of this site possible. Currently, that is planned to continue into 2029, if all goes as expected.

The fuel-bearing material may have ingrained itself with concrete or other materials. That material is intended to be recovered and will be stored onsite in an Independent Spent Fuel Storage Installation (ISFSI) pad. They intend to have that pad adjacent to the TMI Unit-1 pad. We are waiting for DOE to create an ultimate repository where the material can be shipped. The additional source-term reduction is being packaged and shipped off-site for burial at the EnergySolutions facility.

The ISFSI itself is nearing completion and will house 14 casks. These are large metal and concrete casks that will contain these higher activities, components, and fuel pieces. Once completed, they'll be able to start moving some of this higher-activity material as they transfer it to an ISFSI pad. They widened the equipment hatch to allow access to larger equipment; and they are in the process of constructing a decommissioning support building. Remote equipment is being used to remediate some of the higher-radiation areas. The totals for radioactive waste aren't going to be specific because it is constantly changing. On any given day, they may create more waste than they thought they would, and then the next day they may create less. The total number of shipments completed last year was 23.

On a TMI-2 function, we participate in routine meetings, weekly calls, and monthly meetings with NRC project staff concerning the TMI Unit 2 cleanup. There is also a Decommissioning Nuclear Safety Review Board that formed as part of this cleanup. We are not members of this board; however, we are invited to participate in those meetings for the public portion on the non-proprietary side of it.

We are still running the Radiological Environmental Monitoring Program (REMP) the same way it was monitored prior to the shutdown of TMI Unit 1. Crane Clean Energy Center hasn't changed their environmental monitoring program from when it was TMI Unit 1 and that allows us to maintain our program the same way. As Crane Clean Energy Center continues its startup process, the program will reevaluate and adjust the REMP as necessary. Our monitoring program allows us to monitor exposure pathways from the utility that could lead to potential exposures.

US Low-Level Radiation Waste Disposal

Mr. Baracco then introduced Mr. Pawlowski. He presented on accessing US Disposal Sites. Constellation has 12 sites located across Pennsylvania, Illinois, Maryland, and New York and is responsible for managing LLRW at each of those facilities. The waste must be processed, packaged, and transported to appropriate sites for either further processing or burial. Federal regulations require nuclear power plants to have process control programs that outline the controls for processing and packaging radioactive waste onsite.

As part of its process control program, Constellation has established waste streams that organize the waste based on its radiological and physical characteristics. The waste streams get reviewed and sampled either annually or biannually per NRC regulations. Constellation also monitors the chemistry data it collects for trends that may indicate a potential issue within the plant. Part of the waste stream process includes picking appropriate packaging and the mode of transportation for the waste being sent to an outside facility. The packaging needs to be compatible with the waste being transported in it, meet US Department of Transportation's and NRC's packaging standards, and be appropriate for burial. Waste disposal sites also have their own waste acceptance guidelines that must be met before packages are shipped.

While Constellation prepares technical documents, samples results, and packages LLRW, it is stored in specialized storage facilities that follow NRC guidelines. They do have a fleet process control program that is standardized across all sites. Each site has site-specific implemented procedures based upon a process control program. Constellation manufactures packaging for Class A and Class B radioactive waste and then prepares to ship the waste. Most radioactive waste is transported overland by truck, but can also be transported by planes, boats, and trains. Depending on the activity threshold of the waste, security may also be provided for the waste for the duration of the transport. The security required can vary from validation of recipients, reviewing possible security threats, providing constant surveillance, and providing guards for the shipment.

All burial sites are required to meet specific requirements to accept radioactive waste. All waste generators are required to send certification that the waste is compliant with their requirements. Generators also establish waste profiles, such as waste streams, so burial sites can plan how much radioactive waste to accept. Internal reviews are completed annually to ensure generators remain in compliance and receive permission to export the waste to burial sites. Waste processors follow a similar process but have broader waste acceptance guidelines.

Mr. Pawlowski finished his presentation by describing the different challenges faced by the generators. One of the common issues we face during the process control program is the

refueling and maintenance outages and the need for the utility to hire supplemental workers. These workers usually vary in knowledge and skill, and the utility must communicate, train, and monitor the process closely to make sure all the proper rules and regulations are followed. Modern work practices are leading workers to stay at a facility for only a few years before moving on to another position as opposed to workers who stayed for twenty or more years. Unique projects being undertaken by the utility that require specialized equipment and personnel and at the same time they are being used by other utilities. Every project that is planned must consider the rarity of the resources available. There is a shortage of qualified drivers for transporting Class 7 waste and transportation companies are competing with major delivery companies to hire drivers.

Public Comment

No formal written comments were received from the public. Mr. Janati did use the opportunity to point out that no incidents regarding the release of radioactive materials have occurred during transport. Mr. Janati also stated that since the Appalachian Compact has access to two disposal facilities at this time there is no reason to restart the siting process for a low-level disposal site in Pennsylvania.

Adjournment

The meeting was adjourned at approximately 11:13 a.m.