Pennsylvania
Department of
Environmental Protection

LOW-LEVEL WASTE ADVISORY COMMITTEE

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

September 27, 2024

Attendance

LLWAC Members, Alternates, and Legislative Staff
William Ponticello, (Chair), Pennsylvania Council of Professional Geologists
Marc Pawlowski, Constellation Energy Generation, LLC
Jesse Sloane, Pennsylvania Society of Professional Engineers
Justina Wasicek, Sierra Club, Pennsylvania Chapter
Craig Benson, Pennsylvania Farm Bureau
Brian Lorah, Penn State College of Medicine
Lara Renz Paciello, University of Pittsburgh Graduate School of Public Health
Jeffrey Ivicic, PA Senate
Evan Franzese, PA House of Representatives
James Barnhart, Pennsylvania Chapter League of Women Voters
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
Ernest Hannah, Pennsylvania Chamber of Business and Industry

Department of Environmental Protection (DEP) Staff
Dwight Shearer, Bureau of Radiation Protection (BRP)
Stephanie Banning BRP
Rich Janati (BRP's LLWAC Liaison)
Molly Adams (BRP)
Michael Karchner, BRP
Courtney Torres, BRP
Ryan Bankert, BRP
Bryan Werner, BRP
David Baracco, BRP
Troy Prutzman, BRP
Everette Whitlow, BRP
Eduardo Muro, BRP
Chad Duppstadt, BRP
Sean Gimbel (Executive Assistant, WARR)
Laura Griffin (Policy Office)

Others Present
David Hess, Member of the Public
Andrew McMenamin, Member of the Public
Nate Eachus, Member of the Public
Chris DiGiulio, 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 re-elect William Ponticello as Chairperson and Marc Pawlowski as Vice-Chairperson.

Approval of the Meeting Minutes

The LLWAC members voted unanimously to approve the minutes of the September 29, 2023, annual meeting.

Next Annual Meeting

The committee decided to hold its next meeting on September 26, 2025, with an alternate date of October 3, 2025.

Status of LLRW Compacts and Update on Commercial LLRW Disposal Facilities

Mr. Janati 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 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 from the 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.

Mr. Janati 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.

They are also interested in licensing a disposal cell for federal waste mainly from the Department of Energy (DOE). The decision to seek approval for disposal of DU is mainly driven by economic considerations.

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. 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 DU and Greater-Than-Class C (GTCC) waste is being considered by WCS.

   The most recent development is that Construction of a new cell has been completed, and it will add about 425,000 ft^3 of capacity at the WCS facility. The license renewal application review is in progress so they're now in timely review of their license application.

Review of Appalachian Compact LLRW Generation Information

Mr. Janati provided background information on the DOE's Manifest Information Management System (MIMS). MIMS contains information on LLRW disposal at the current commercial LLRW disposal facilities. Mr. Janati said Pennsylvania Department of Environmental Protection (PADEP) 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.

Mr. Janati discussed the waste disposal information for calendar year 2023. The Appalachian Compact disposed of 71,986 ft^3 of LLRW, with 68,455 ft^3, coming from Pennsylvania, 3,482 ft^3 from Maryland, $42 ft^3 from West Virginia, and 7 ft^3 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. Mr. Janati also provided information on the radioactivity of waste generated in the compact. The compact generated about 28,946 Ci of LLRW. Pennsylvania generated about 28,8341 Ci of waste and Maryland generated about 115 Ci of waste. Both Delaware and West Virginia generated less than 0.1 Ci.

Mr. Janati provided a brief discussion of waste disposal trends in the compact for the period of 2002 to 2023. The Barnwell disposal facility in South Carolina stopped accepting waste from outside the Atlantic Compact in July 2008, resulting in the storage of Class B and C wastes, mainly by the nuclear utilities, for about 5 years. Beginning in 2014 and through 2023, the reported volume and radioactivity also includes Class B and C wastes that were shipped to the WCS facility in Texas. In 2016, the Safety Light facility in PA started cleanup effort under the Environmental Protection Agency's Superfund Program, which generated large quantities of Class A waste. The cleanup continues but currently there is not much LLRW being generated by this facility.

Mr. Janati provided a brief discussion of radioactivity of waste for the period of 2002 through 2023. From the years 2002 through 2008, the activity level of waste being shipped was very high due to the availability of the Barnwell facility to our compact. The nuclear power plants in the compact shipped large quantities of high activity irradiated components and reactor cleanup resins to Barnwell in 2007 and 2008, knowing that they will no longer have access to this facility.

The shipment of radioactive waste has been relatively low after the closure of the Barnwell facility to our compact beginning in 2009. We began shipping waste to the WCS facility in 2014 and we have been able to ship Class B and C wastes that contain higher activity to this facility. In 2018 and 2023, the reported activity is very high because of the shipments of irradiated reactor components from a nuclear power plant in PA to the WCS facility in Texas.

Mr. Janati presented a pie chart showing that in 2023, about 62% of the compact's LLRW by volume was disposed at the Clive facility in Utah and about 38% by volume was disposed at the WCS facility in Texas. In comparison, about 98% of the compact's LLRW radioactivity was disposed at the WCS facility and about 2% of radioactivity was disposed at the Clive facility. Mr. Janati stated that these statistics show us that our generators are sending some of their higher concentrations of waste to the WCS facility.

Mr. Ponticello stated PADEP does a tremendous job in collecting this data and accurately condensing it and representing it. You can see the vast majority, both in volume and in curies, is generated from Pennsylvania. So, it's very important to our state that we monitor this data using this method on an annual basis. I commend Mr. Janati and the Bureau of Radiation Protection (BRP) on the way they manage data. Mr. Janati stated as far as the volume; we expect that the decommissioning of the Three Mile Island Unit 2 (TMI-2) will raise the volume of LLRW. We also have the Shallow Land Burial Site in Parks Township that is now being cleaned up by the Army Corps of Engineers. The waste is from fuel processing many years ago that was buried on site in shallow land burial, which is no longer permitted under the Pennsylvania law. Now they will have to dig up the LLRW and excavate it. It will go to a processor in Pennsylvania, to Alaron, and then they will ship it to a disposal facility. Mr. Ponticello asked if the LLRW is mixed waste. Mr. Janati stated it could contain some mixed waste and some of it is special nuclear materials.

Mr. Sloan asked if BRP tracks the generation of waste or just the disposal of the waste. Mr. Janati stated that BRP tracks the disposal volumes because the disposal numbers are very

accurate. Mr. Sloan asked if we could determine the type of isotopes that drive activity. Mr. Janati stated it depends on the waste stream. For example, irradiated components from nuclear power plants can contain cobalt, nickel, and iron. Mr. Sloan then asked how much of the long-lived isotopes like iodine-129 or chlorine-36. Mr. Janati stated that there is not a lot of either of those isotopes compared to other radionuclides. Mr. Pawlowski stated that their disposal waste classifications are based upon the long-lived beta isotopes that will be around when the burial sites close. That is why each burial site has a performance analysis assessment that they must perform to project out 500-1,000 years in the future what the dose rate to the public might be, or to farmers and houses in the area. He said the short-lived isotopes are also very important, and that decides whether the waste should be buried in the EnergySolutions facility in Clive, Utah, or if it needs more controls down in Texas at the WCS facility.

Mr. Shearer provided an update for the Shallow Land Disposal Area (SLDA) in Parks Township. The Army Corps of Engineers is in constant contact with PADEP on a month-to-month basis. Currently, Jacobs Field and Engineering is the primary contractor. They have a public meeting scheduled for November 7, 2024, at the Parks Township Fire Hall for anyone interested in attending. I would like to invite the Army Corps to come to next year's meeting to do a presentation on their facility. This is a half of a billion-dollar cleanup. The number of structures and technology and public awareness and the overall magnitude of this cleanup is just phenomenal. I can't be more pleased with how they are reaching out to us and including us as a partner. Chairman Ponticello agreed this would be a good idea to have them come to next year's meeting.

Decommissioning of Nuclear Power Plants

Mr. Janati stated that the focus of this presentation is on nuclear power plant decommissioning, as other nuclear facilities undergo this process as well. He mentioned that several nuclear power plants are currently undergoing decommissioning, while several others already completed the process. He stated that the TMI-2 is the only commercial nuclear power plant in PA that is undergoing decommissioning at this time. The decommissioning of TMI-2 is expected to be one of the most challenging decommissioning projects in the U.S., because TMI-2 experienced the worst commercial nuclear power plant accident in this country.

Mr. Janati provided an overview of nuclear power plant decommissioning. He discussed methods and phases of decommissioning, decommissioning funds, decommissioning business models, decommissioning public involvement, and the status of nuclear power plant decommissioning in the U.S. He also provided an estimate of the LLRW associated with Three Mile Island Generating Station Unit 1 and Unit 2, based on the information available in the Post Shutdown Decommissioning Activity Report, as follows:

Waste Type	TMI-1	TM-2
Class A	347,776 ft^3	4,200,000 ft^3
Class B & C	1,770 ft^3	17,000 ft^3

Regarding decommissioning funds, Mr. Pawlowski of Constellation stated that we are required to submit the status of our decommissioning funds to the Nuclear Regulatory Commission (NRC) every two years. However, internally, we review the funds annually and adjust as needed to ensure they are properly maintained. He also mentioned that a great majority of decommissioning generated LLRW is low-activity contaminated soil.

Mr. Barnhart asked if the NRC maintains the nuclear power plant decommissioning related information on its website. Mr. Janati replied that they do.

TMI-2 Decommissioning Update and PADEPs Oversight Activities

Mr. Werner presented an update to the committee on the oversight activities of TMI-2. This presentation is from the viewpoint of BRP. We do not have regulatory authority over this 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, operate, and participate in some of their committees as well as going over the cleanup. The overall authorities 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 recovery of 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 Installation (ISFI) storage pad. They intend to have that pad adjacent to the Unit-1 pad. We are waiting for DOE to come with 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 concentrations and activities have varied. Some of it is highly active, but most of it has been low-level as they work their way into the facility to get to the more highly radioactive parts of the facility.

The ISFI itself, as it is being constructed, is currently planning to house 14 casks. These are large metal and concrete casks that will contain these higher activities, components, and fuel pieces. They expect to complete this next year, and then they'll be able to start moving some of this higher activity material as they transfer it to an ISFI pad. Remediation has begun on some of the higher radiation areas to reduce the source term.

The numbers 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 40. Most of those were your standard intermodal size containers. Some of the wastes are contaminated with lead, so you won't have a full container of waste.

As far as total volume or physical volume, they are looking to complete this within this calendar year. Within the next few months, as many as 20 additional shipments could be sent for disposal. I reviewed some of their numbers recently, and there are a handful that could accelerate disposal even faster. They don't have a number set yet for 2025. They do anticipate significant increases in the amount of waste that will be shipped for disposal next year. As they progress further in, they will be able to remove some of the higher-activity level waste, and they will be able to access more of the lower-activity waste and begin to ship it for disposal.

We are still running the radiological environmental monitoring program the same way it was monitored prior to the shutdown of Unit-1. Unit-1 hasn't changed their environmental monitoring program and that allows us to maintain ours program the same way. As we move forward, I don't anticipate that changing as long as Unit-1 is progressing toward a restart. Our monitoring program allows us to look for the deposition or transmittal of any radiological constituents in surrounding environments. For example, we look at the water, the sediment, and soils. We also conduct routine air monitoring.

On a TMI-2 function, we participate in daily calls with the NRC. The lead staff and inspectors hold a monthly meeting with us to update us on the status and for anything else we may need to review. There is also a Decommissioning Nuclear Safety Review Board that has been 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. The advisory panel also holds meetings 2 to 3 times a year and we are asked to make statements during these meetings.

From a regulatory basis, PADEP does have regulatory authority over the non-radiological items such as water, and discharge permits, and permitting. So, when needed, we do help facilitate such activities.

Ms. Wasicek asked what it would take to move waste out of the ISFI pads. She also asked if it is dependent upon a national disposal site and if Mr. Werner could clarify what it means when he stated it was up to DOE. She also inquired if the status of the ISFI pads is indefinite or if there is a time limit. Mr. Werner answered that the long-term storage plans for the ISFI pads is dependent upon the federal government as they have committed to develop a long-term storage facility for all of the material. Until that time, there is no place that this material can go unless a facility for temporary storage is built. Ms. Wasicek stated that this would go beyond the sixty-year timetable. Mr. Werner stated that are no specific paths forward from the federal government or DOE. It does go beyond the sixty-hear plan because that material is not able to be sent anywhere else. The decommissioning is of the facilities itself, not the fuel.

Ms. Wasicek stated that she has some concerns that the ISFSI is located on the island, due to weather events, and asked if the department shares her concerns. Mr. Werner stated the NRC regulates that aspect of the decommissioning process and that the department has had the opportunity to look into that as well. They had the opportunity to investigate this. However, the NRC does their full evaluation of the status of where it can go on the island. So, for TMI, they've made the determination that those ISFI pads are acceptable to be there.

Mr. Barnhart asked about the material from the melted fuel in TMI-2. It is mixed with other materials, but it will eventually be stored in casks. Since the casks are designed for storage of

spent nuclear fuel only and for certain geometry, who will perform fissile assessments of the fuel now that it is outside the geometry and mixed with other materials. Does the NRC certify the casks for this type of mixed fuel. Mr. Shearer stated that licenses for the storage casks for the melted fuel have been updated. They did go through the entire evaluation so they will go into a fixed geometry. In response to a question from Mr. Barnhart regarding storage of TMI-2 fuel at the DOE facility in Idaho. Mr. Janati stated that as of now, DOE has not shown any interest in storing the remaining fuel debris from TMI-2 decommissioning in Idaho for further assessment and examination.

Mr. Werner also described the NRC inspection activity at TMI-2. He stated that the NRC oversight and inspection activity is very intensive, and that the NRC is plugged in throughout the entire time of this clean up.

In response to a question regarding monitoring for Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM), Mr. Shearer stated that PADEP is made up of many programs such as air, water, waste, and radiation protection. Radiation protection will always lend its expertise to its sister programs. And, at this time, questions of TENORM, while the Commonwealth does not regulate TENORM, the oil and gas, air, water, and waste may have permits that would trigger or come under review of that monitoring and would certainly help in addressing those questions and concerns.

Public Comment

An audience member expressed concerns about wastewater being dumped on Pennsylvania rural roads. As reported by PADEP in 2023, 86% of users did not report how much or where they dumped it on the roads. Now I know you are going to say that the two aren't connected and it's a different level of radioactivity. But for this leadership group here, this needs to be addressed and not whitewashed from the media by not being talked about. This meeting is held once a year. We're not going to talk about conventional waste dumping, to me it is intentional. Don't you think the public is paying attention? People are getting sick, and this wastewater is getting dumped back into the streams. People are getting cancer. Pennsylvania has the second highest cancer rate in the country. How could this not be addressed at a low-level waste meeting that is held once a year. Mr. Janati stated that the Appalachian Compact's definition of low-level radioactive waste does not include TENORM. Therefore, TENORM is outside the scope of this committee. The department's Solid Waste Program is the lead for TENORM and has its own advisory committee.

Mr. Ponticello stated a lot of these definitions are from the NRC. So, the definitions of low-level radioactive waste are defined by the NRC. We can't adjust that for Naturally Occurring Radioactive Materials or TENORM. That definition is from the federal government and the agreement states must follow this.

Adjournment

The meeting was adjourned at approximately 12:10 p.m.