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House Committee on Science, Space and Technology
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Chairman Bowman, Ranking Member Weber and Members of the Subcommittee, it is an honor to appear before you today to represent the Department of Energy’s (DOE) Office of Environmental Management (EM).

EM’s mission represents the government’s strong commitment to cleaning up the environmental legacy of the national defense programs that helped end World War II and the Cold War. EM’s vital mission does not just address past legacy, though, it also helps to support and enable DOE’s ongoing national security and scientific research and development missions.

To achieve its mission, EM is pursuing a world-class technology development program to accelerate the cleanup mission, increase efficiency and protect human health and environment.

Record of Results for the Environment

Over the last 30 years, EM has made significant progress, completing cleanup of the environment at 92 out of a total of 107 sites, including former sites in Illinois, New Jersey, Pennsylvania, Oregon, Texas, Florida and others. EM’s significant accomplishments to date have included completing demolition of the Plutonium Finishing Plant, a facility that produced two-thirds of the nation’s Cold War-era plutonium at the Hanford Site in Washington state; completing construction and initiating operation of two depleted uranium hexafluoride (DUF6) conversion plants at the Portsmouth Site in Ohio and the Paducah Site in Kentucky; managed one of the largest groundwater and soil remediation efforts in the world by treating tens of billions of gallons of contaminated groundwater including at sites like Los Alamos, Hanford, Moab and Savannah River; completing waste vitrification activities and subsequent demolition of the Vitrification Facility at the West Valley Demonstration Project in New York; completing demolition of all DOE owned buildings at the Energy Technology Engineering Center in California; opening the world’s only deep geological repository for transuranic waste generated from atomic energy defense activities at the Waste Isolation Pilot Project in New Mexico; and completing construction on the entire tank waste treatment system at the Savannah River Site, enabling significant progress in how the Department tackles one of its largest environmental and financial liabilities at that site.

New Era of Cleanup Success

These historical accomplishments were enabled by the significant investments Congress has made in the EM program and aided by technology and research and development. Taken together, these accomplishments have ushered in tangible results for communities and the environment in a safe, effective, and responsible manner. Today, EM is continuing to advance

the cleanup mission by achieving impactful progress at sites across the country.

Demolition of the X-326 uranium process building was just completed, marking the most significant cleanup milestone to date at the Portsmouth Site in Ohio. Completion of the teardown of the two-story structure covering 56 acres under roof, is a critical achievement in the cleanup and transformation of the Portsmouth Gaseous Diffusion Plant as EM performs environmental cleanup at the site in preparation for community reuse and reindustrialization.

Deactivation and decommissioning progress is also advancing at other sites like the West Valley Demonstration Project in New York where the demolition of support buildings was completed earlier this year. This paves the way for demolition of the site's Main Plant Process Building,

Cleanup activities at another site in New York, the Brookhaven National Laboratory, have been completed with demolition of the 320-foot-tall red-and-white High Flux Beam Reactor exhaust stack, restoring the local skyline.

The Waste Isolation Pilot Project (WIPP) in New Mexico is undergoing major upgrades necessary to continue its mission for decades to come, including improvements to aging infrastructure and construction of the new Safety Significant Confinement Ventilation System. Taken together these projects will help ensure we have the infrastructure in place to support WIPP disposal operations for years to come. Shipments of legacy transuranic waste to WIPP will continue to progress from sites across the DOE complex, including the Los Alamos National Laboratory in New Mexico.

At the Savannah River Site in South Carolina, we are now processing record amounts of tank waste. Full utilization of the Salt Waste Processing Facility will further accelerate the tank waste mission next year, keeping the Savannah River Site on track to complete the bulk of its tank waste treatment mission in a decade.

At the Hanford site in Washington state, EM is treating radioactive and chemical waste from large underground tanks for the first time ever on a large scale, using a technology initially developed at Savannah River. This is an historical achievement as EM progressed towards initiation of the Direct Feed Low Activity Waste (DFLAW) project that will convert this waste into glass for disposal.

Technology development has played a role in these and other EM accomplishments through engagement with the National Laboratories or through the application of available technologies. At Oak Ridge in Tennessee, technology was developed through the Savannah River National Laboratory to reduce mercury vapor and debris to better protect workers as site facilities were deactivated. At the Portsmouth site in Ohio, EM worked with Carnegie Mellon University to develop a robotics system to measure uranium quantities within the piping in the site's buildings to aid in safe deactivation and decommissioning. Likewise, the West Valley Site in New York adapted a commercial drying system to dehumidify the site's waste storage tanks to prevent corrosion and better protect the environment.

As EM makes transformational progress at sites across the DOE complex, EM remains

committed addressing the responsibilities the Department has to the communities most directly impacted by the environmental legacy of the past.

Addressing Cleanup Challenges

While steady progress continues across the EM program, the environmental cleanup mission has decades yet to go at some sites. Of the Department's \$512 billion environmental liability, \$406 billion falls under the EM mission.

EM is steadfast to tackle major remaining hurdles to sustained success. Those include:

- Developing a realistic and achievable approach for addressing the high-level tank waste at Hanford.
- Defining the path forward for key sites like Savannah River so they remain integral to DOE's national security and scientific research missions for decades to come.
- Strengthening relationships with our regulators and stakeholders in key states across EM to gain the alignment that will enable our collective future progress.
- Building a high quality and diverse workforce that benefits from a wide range of backgrounds and experiences to continue this mission long after most of us in this room have retired.

Given the scale and scope of the remaining cleanup mission, it is critical to develop new and innovative approaches to performing cleanup activities so that EM can safely complete its work in a more efficient and more cost-effective manner. EM is focused on being best in class when it comes to program and project management and continually works to identify and assess opportunities to reduce environmental risks, drive down liabilities, and address emerging risks such as PFAS. Whether it's analyzing waste disposal options, reaching decisions about remaining waste streams, working collaboratively with regulators to achieve alignment on remaining hurdles or investing in science and technology development, EM is identifying and deploying scientifically based approaches that provide opportunities to safely complete the mission sooner and more efficiently.

Developing An Integrated Technology Development Program

EM is developing an integrated technology development, demonstration, and deployment program by aligning the program with EM mission priorities and leveraging the capabilities of DOE National Laboratories, academia, private industry and other federal agencies.

Utilizing increased funding for the Minority Serving Institutions Partnership Program, EM is expanding the program which partners with Historically Black Colleges and Universities and other Minority Serving Institutions (MSIs) to build and maintain a well-trained, technically skilled, and diverse workforce. This investment will enable EM to add a technology curriculum and professional development program, graduate fellowship program and a research partnership between EM and minority serving institutions. The program includes competitive research grants in partnership with national laboratories as well as shared interest research partnership grants with MSIs.

EM is developing an R&D dashboard that will include funding- performance data on R&D efforts to enable EM to monitor and evaluate results throughout the EM complex.

The Savannah River National Laboratory has always been a leader when it comes to developing the technology needed to complete the EM cleanup mission. EM is leveraging the expertise of the Savannah River National Laboratory and the Network of National Laboratories for Environmental Management and Stewardship (NNLEMS) to develop innovative solutions in the fields of environmental cleanup, national security and science and energy security that will benefit EM, the National Nuclear Security Administration (NNSA) and other DOE missions.

Test bed programs continue to be established through the technology development program at various EM sites to allow for evaluation of innovative technologies to address high-priority program needs. For example, EM continues to identify safe, effective, and viable options for the treatment of all Hanford's tank waste, including supplemental low activity waste. One such approach is the proposed Test Bed Initiative (TBI) Demonstration. The TBI Demonstration would address independent recommendations and comments from the Government Accountability Office, the National Academy of Sciences, national laboratories, and others to further study the potential cost, safety and environmental performance of potential treatment and disposal alternatives. Implementation of this TBI Demonstration technology on an industrial scale could have the potential to safely pretreat low-activity waste from Hanford tanks, solidify the waste in grout, and dispose of it off-site in a manner that is protective of the workers, the public and the environment.

EM routinely enhances and deploys technology advancements in areas of tank waste cleanup, soil and groundwater remediation, facility decommissioning and decontamination, and worker safety.

For example, an innovative cesium extraction system was successfully adapted by a multi-national lab team from the cleanup of the Fukushima-Daichi plant in Japan. The adaptation was used to double the production rates in salt waste treatment at the Savannah River Site. The technology is now being used at Hanford.

Efforts involving multiple national laboratories have focused on the development of innovative environmental monitoring systems to provide long term protection at EM's legacy soil and groundwater contamination sites. A collaboration of national laboratories (including the Savannah River National Laboratory, Lawrence Berkely National Laboratory, the Pacific Northwest National Laboratory and Sandia), universities (including Clemson, Oregon State University, North Carolina State University and Cornell), industry and EM led to a more energy efficient and sustainable approach to protecting groundwater from the spread of hazardous chemicals. This approach has been successfully applied at the Savannah River Site, saving hundreds of millions of dollars and shaving years off of the remediation schedule.

Applied research and development have led to advancements in air filtration and treatment with a primary focus on nuclear applications and to address critical needs and challenges in these areas

within the DOE complex. At WIPP, deployment of this technology aims to increase operations efficiency and safety through means of both automation and modernization of aboveground monitoring.

EM is continually seeking to enhance its technology research and development (R&D) efforts to better identify and demonstrate new and innovative approaches for tackling cleanup challenges (including emerging contaminants) that offer a significant return on investment, and to effectively adapt and implement existing or commercially available technologies to EM cleanup needs.

EM takes a comprehensive approach to prioritizing all cleanup work across the complex, to include the associated R&D. First and foremost, EM seeks to address any issue posing an immediate risk to human health or the environment. Taking many variables into account, EM's cleanup priorities are: 1) activities to maintain a safe, secure and compliant status; 2) radioactive tank waste stabilization, treatment and disposal; 3) spent (used) nuclear fuel storage, receipt and disposition; 4) nuclear material consolidation, stabilization and disposition; 5) transuranic waste and mixed low-level radioactive waste disposition; 6) soil and groundwater remediation, and; 7) excess facilities deactivation and decommissioning

In alignment with these priorities, one of EM's most pressing needs is addressing the remaining tank waste mission. Of EM's \$406 billion environmental liability, \$260 billion stems from radioactive waste stored in massive underground tank wastes at Hanford represent one of the Department's largest financial and environmental liability. In 2021, EM commissioned NNLEMS to develop an R&D Roadmap for accelerating the Hanford tank waste mission. The Roadmap will be used to continually identify R&D opportunities to deploy technologies that could help improve efficiency along with cost savings and schedule acceleration for the Hanford tank waste mission.

Similarly, EM will adapt and implement existing technologies across the complex to implement new R&D developments to accelerate timelines, reduce risks and reduce life-cycle costs through more efficient and innovative approaches.

In partnership with the national laboratories, DOE is conducting a holistic EM technology review to evaluate technology development programs throughout the complex to ensure that they have overall unity of effort, they are efficient, and they provide maximum value. This assessment will be used to recommend on the structure and implementation of an integrated R&D effort and to prioritize EM and DOE complex-wide issues, challenges, and risks for maximum return on R&D investment.

Conclusion

EM is committed to advancing the cleanup mission and preparing for sustained success, maintaining national security priorities, and supporting communities most impacted by the environmental legacy of the past.

As the mission is carried out, EM is committed to continuous improvement and making further advancements, including in the area of technology development, to ensure that cleanup activities are conducted in a safe, efficient, and cost-effective manner.

The EM mission is among the Department's most complex and technically challenging. In order to maintain the level of progress being achieved, meet regulatory milestones and bring EM sites closer to completion, the vast majority of the federal investment in EM must continue to be focused on cleanup work in the field. EM is committed to taking a comprehensive approach to prioritizing research and development activities across the complex to maximize the benefit of available R&D investments, while maintaining the momentum to achieve meaningful progress toward environmental cleanup and site closure.

EM appreciates the Subcommittee's interest in utilizing technology development to enhance the environmental cleanup mission and looks forward to working with Congress on ways to further improve in this area.