Waste Disposition:
A New Approach to DOE's Waste Management Must Be Pursued

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Energy Communities Alliance

Local concerns. National impact.

EXECUTIVE SUMMARY

There is perhaps no issue of more importance to the communities, states and regions that host the Department of Energy's (DOE's) environmental cleanup sites than the ultimate disposition of radioactive waste, particularly the high-level waste (HLW) that dominates the risk to human health and the environment, DOE's environmental liability and risk, and its annual budget. Despite the nearly thirty (30) years of effort that have followed the creation of the DOE Office of Environmental Management (EM) to address DOE's radioactive legacies, the risks are not changing significantly and the life-cycle costs of the effort continue to grow.

If the tide is to turn, DOE must create a new approach to waste management. For too long, costly treatment and disposal decisions have been made based on artificial standards, ones that base waste classification on origin rather than the actual characteristics and risk to human health arising from the waste. This highly-flawed policy framework has been applied inconsistently across the complex by DOE and state regulatory preferences, resulting in an ever-increasing price tag and diminishing returns for the work, and risk-reduction. The communities that host DOE sites suffer under this ad hoc approach, and the time is ripe for DOE and Congress to put in place a smarter, risk-based decision framework that drives progress in a more consistent, cost effective and efficient manner across the complex without sacrificing human health and safety or community input into the decision-making.

> ***"For too long … disposal decisions have been made based on artificial standards, ones that base waste classification on origin versus the actual characteristics and risk to human health arising from the waste."***

This paper is written by the affected local governments and outlines a strategy for our host communities to work with the DOE, Congress, states, tribes and stakeholders on significant, near-term advances in radioactive waste management. If this course is followed, an estimated $40 billion or more could be saved on the remaining lifecycle cost of DOE's EM program, which currently stands at $257 billion. This savings is a conservative estimate based on reducing years of operations; reducing the number, size and duration of storage facilities pending availability of a HLW repository; accelerating tank retrievals and closures; and, avoiding unnecessary and costly treatment facilities.

To achieve this substantial cost savings, the Energy Communities Alliance (ECA) is recommending five key actions for Congress and/or the DOE to undertake in the near-term:

1. Congress should develop legislation that clarifies the existing definition of high-level waste in the Nuclear Waste Policy Act (NWPA). Specifically, that wastes derived from reprocessing of spent nuclear fuel can be managed as "other than HLW." The legislation should require a literal reading of the Nuclear Waste Policy Act definition of high-level waste: "(12) (A) the highly radioactive materials [...] that contains fission products in sufficient concentrations." Representatives from the communities in South Carolina have created draft legislation that is set forth in Appendix A (See: page 33).

2. DOE must immediately revise its radioactive waste management policy (DOE Order 435.1) to clarify that waste will be managed and dispositioned according to its characteristics, not its origin, consistent with 10 CFR Part 61 regulations. This will allow some waste currently managed as high-level waste to be more appropriately dispositioned as transuranic (TRU) or low-level waste (LLW).

3. DOE needs to immediately begin work with the State of New Mexico on a permit modification for the Waste Isolation Pilot Plant (WIPP) to remove the blanket prohibition on tank waste and wastes managed as HLW so that any TRU waste that meets the applicable requirements can be disposed of at WIPP.

4. Congress and DOE should provide full funding for WIPP capital asset projects (ventilation projects, shaft/conveyance) to support optimal use of WIPP, resumption of mining to increase capacity, and resumption of the full range of waste disposal capabilities.

5. DOE should begin work on a number of pilot projects and waste management policy decisions—including a planned pilot project to demonstrate feasibility of treatment and off-site disposal Hanford low-activity tank waste, and documenting the technical basis and plan for disposition of certain treated tank wastes at Savannah River and Idaho as TRU waste to WIPP—in order to make full use of the clarified HLW definition.

ECA understands this is a large change from current policy. We have seen how the current policy has caused DOE to tread water and store this waste in our communities with no clear path forward to decrease risk, cut costs, or complete the job that DOE started over thirty (30) years ago. We understand that there are a lot of moving parts. Hence, we put together this roadmap for Congress and DOE to move forward. We also understand that some have an interest in not evolving and leaving the waste in place. The local communities find this unacceptable.

As any new initiative begins, it is imperative that DOE enter into discussions as early as possible with host communities and states regarding incentives for accepting expanded site missions like that at WIPP. Communities that remain as de facto interim storage sites due to government failure to complete long-term repositories, should be compensated consistent with incentives that might be negotiated for interim used fuel storage facilities like those proposed by some in Congress.

This two-pronged strategy (i.e., within DOE and legislatively) is based on technical justifications to achieve shared benefits among all sites, host communities, and states in terms of a shared understanding of risk, avoided costs, reduced inventories of waste and identifiable, tangible progress across the complex.

1.0 INTRODUCTION AND BACKGROUND

In 1989, DOE established EM to address DOE's radioactive legacies. Despite decades of effort and expenditure of billions of dollars annually, the lifecycle costs of the program continue to grow.

Liquid HLW, the byproduct of Manhattan Project and Cold War-era national defense nuclear weapons production, is the focal point of the DOE cleanup program's ~$6 billion annual budget and makes up the bulk of its $257 billion lifecycle cost. Over 90 million gallons of liquid radioactive waste, stored in a series of aging underground tanks and associated support facilities primarily at the Savannah River Site in South Carolina and the Hanford site in Washington State, present unique technical and operational challenges related to waste monitoring, tank/facility surveillance, retrieval, treatment stabilization and permanent disposal.

Earlier this year, the Government Accountability Office (GAO) added the U.S. government's environmental liability—the vast majority of which resides in DOE—to its "High Risk" list for the first time, raising concerns about the lack of progress. The GAO report states:

> *Despite billions spent on environmental cleanup, DOE's environmental liability has roughly doubled from a low of $176 billion in fiscal year 1997 to the fiscal year 2016 estimate of $372 billion. In the last 6 years alone, EM has spent $35 billion, primarily to treat and dispose of nuclear and hazardous waste and construct capital asset projects to treat the waste, while EM's portion of the environmental liability has grown over this same time period by over $90 billion, from $163 billion to $257 billion.*

This growing environmental liability has rightly drawn the attention of the new Administration, key lawmakers on Capitol Hill and the communities that host these DOE sites.

Significant changes must be made in how DOE manages, treats and dispositions its entire portfolio of waste, from low-activity to high-level. For too long, costly decisions about treating and disposing of DOE's tank waste have been driven by the origin of the waste, rather than by any technical consideration for its actual risk to human health and the environment. As GAO stated in its High-Risk report:

> *DOE's environmental cleanup decisions are not risk-based and its risk-based decision making is sometimes impeded by selection of cleanup remedies that are not appropriately tailored to the risks presented, and inconsistencies in the*

regulatory approaches followed at different sites. We and others have pointed out that DOE needs to take a nation-wide, risk-based approach to cleaning up these sites, which could reduce costs while also reducing environmental risks more quickly.

A meaningful reduction in the life-cycle cost requires smarter disposition decisions based on waste characteristics versus source, and utilizing the full potential of existing treatment and disposal resources. DOE should also leverage lessons learned, especially where such approaches have been used successfully in the commercial nuclear industry in the United States and abroad that can be adapted for DOE application. This change would have numerous benefits in terms of accelerating cleanup schedules, implementing proven or adaptable safe solutions and avoiding billions of dollars in unnecessary costs. This can be realized by allowing some wastes, now managed as HLW, to be segregated or processed (separated), then safely disposed of as TRU or LLW, depending on its characteristics.

This approach is not about DOE arbitrarily changing the classification of HLW to save money. Rather, this is about DOE appropriately aligning waste disposition decisions with the actual risk posed by the waste. This enables the limited cleanup dollars to be allocated and spent most efficiently and effectively across the complex as DOE addresses each waste class based on potential impact to human health and the environment.

Waste disposal policy based on the actual make-up of the waste versus the origin is certainly nothing new—the International Atomic Energy Agency's waste classification system is a strong example and is used by all other countries managing nuclear waste—and sufficient technical and programmatic analyses have been conducted that these enable decisions now.

Likewise, the time appears ripe to make such a change. The Administration has made regulatory reform one of its key priorities, opening the door for this significant pivot within EM. An April 24, 2017 DOE action memorandum on the regulatory reform effort within the Department specifically targets regulations for "repeal, replacement or modification" if they "impose costs that exceed benefits," among other criteria. Amidst this broad effort in DOE and the government as a whole, a reform of DOE's waste disposition policies fits squarely within this initiative and should be aggressively pursued.

A comprehensive, nationwide strategy of risk-based decision-making related to radioactive waste management, if properly implemented, will benefit all host communities and U.S. taxpayers and set the stage for decisive action in concert with transparent, meaningful stakeholder engagement.

2.0 THE FOUNDATION: CLARIFYING THE BASIS OF WASTE CLASSIFICATION

It has long been recognized that the U.S. regulatory framework for radioactive waste management is overly complicated and inconsistently based. Whereas some waste streams are defined by their radiological constituents, such as TRU waste, others are commonly defined by origin, such as HLW. Still others are defined by exclusion, such as the "catch all" definition for the low-level waste (LLW), which includes all radioactive wastes other than HLW, TRU waste or by-product material. This patchwork framework results in numerous programmatic obstacles, inefficiencies and legal interpretations, which could be avoided through relatively simple clarifications in DOE waste management policy and statutory language.

DOE waste management policy update is overdue

DOE has made strides in risk-informing[1] some of its disposal practices, such as providing for "waste incidental to reprocessing" to differentiate a limited number of waste items used to support spent fuel reprocessing (pumps, melters, tanks) from the actual liquid wastes resulting from the dissolution of spent fuel and recovery of its fissile material for reuse. Similar analytical methods for the classification of certain DOE equipment and wastes have been codified in the tank waste determination process in Section 3116 of the National Defense Authorization Act (NDAA), although it is not equally applicable at all DOE sites (i.e., it is limited to Idaho and Savannah River). In addition, DOE sets a positive example for the Nuclear Regulatory Commission (NRC) and Agreement States in its use of site-specific performance assessments and waste acceptance criteria that ensure its LLW disposal sites are operated within risk-based, yet optimized, safety envelopes.

Yet there are many instances where DOE is conservative in its management and classification of wastes. There are also stark differences between DOE's classification and management of tank wastes among DOE sites, including Savannah River, Idaho National Laboratory and Hanford.

In 1999, DOE issued Order 435.1, Radioactive Waste Management.[2] It marked a significant change from the previous DOE order for waste management and sought to formalize significant safety improvements in waste management practices informed by a complex-

[1] It is notable that this "risk-informing" is distinct from past DOE initiatives to implement "risk-informed end states" for DOE sites, which was viewed by some communities as an effort to scale back the degree of planned cleanup. In contrast, risk-informing the waste management policy and strategies will remove unneeded conservatism which is deterring cleanup progress while ensuring wastes are managed and disposed in accordance with the radiological risks to human health they actually present.

[2] See DOE Order 435.1, https://energy.gov/sites/prod/files/2016/03/f30/DOEO435-1RadWasteMan.pdf

wide review that had been conducted as part of the DOE Order development process. In 2010, DOE conducted a second complex-wide review of its waste management practices and has been working since to update DOE Order 435.1 to incorporate regulatory changes (such as Section 3116), technology developments and demonstrated best practices.

Now, seven years later, DOE's policy update is overdue. Its issuance has seemingly been delayed due to DOE concerns with the reactions of states and stakeholders. In the absence of the revised policy, DOE sites and projects continue to implement overly conservative practices that increase costs and prolong cleanup schedules. A policy update based on a shared understanding of risk rather than origin would result in significant portions of the DOE's waste streams being treated and/or disposed in efficient and regulatory compliant ways, while still addressing human health and environmental risks.

Removing inconsistencies, unnecessary conservatism is key

DOE's policy update should centrally focus on ensuring all waste classification actions and subsequent waste disposition strategies are risk-informed to the maximum extent possible. This means wastes should be ultimately classified based on their radiological constituents and/or final waste form, which will then determine the selected disposal pathway. In contrast, at Hanford DOE conservatively manages all tank wastes as HLW inventory despite the fact that some of the wastes in the tanks did not result from the actual reprocessing of spent fuel. Further, DOE's baseline plan is to vitrify not only the high-activity portion of the tank waste—that which truly requires management as HLW and requires permanent isolation in a geologic repository—but also the low-activity portion that will be separated by a complex, pre-treatment step.

The comparable low-activity waste form at Savannah River Site is being mixed with cementitious materials and stabilized for on-site, near surface disposal in the saltstone disposal units. Similar wastes from the Atomic Energy Agency's pilot fuel processing unit, the Separations Process Research Unit in New York, as well as LLW from DOE's West Valley plant have been stabilized in a cementitious/grouted form and disposed in a commercial or government LLW disposal facility. The existing momentum to vitrify Hanford's take waste through the Direct Feed Low Activity Waste approach is a positive step forward and should be continued, but DOE could also realize significant cost and schedule improvements should they proceed with plans to demonstrate the technical and regulatory feasibility to stabilize Hanford's low activity tank waste for off-site disposal using existing available commercial treatment and disposal facilities. DOE experience and recent projections indicate that such a commercial approach could result in the savings of billions of dollars in new facility capital and life cycle cost savings, and could begin significantly sooner than current DOE baseline

plans. In addition, DOE should exploit the significant technology development in cementitious waste forms.

Other overly-conservative waste management strategies exist at other DOE sites. For example, at Idaho, containers of processed wastes that can be compliantly characterized as LLW containers are being managed for future shipment to WIPP as TRU waste because they contain a single waste component that, if packaged alone, would meet the definition of TRU waste.

On a larger and more cost-significant scale, the Integrated Waste Treatment Unit (IWTU) at Idaho is being commissioned to turn four tanks of sodium-bearing wastes (SBW) into a TRU waste form designed and selected to meet the acceptance criteria for WIPP. However, the SBW, which was derived primarily from the flushing of lines and vessels in the new calcine processing facility and related facilities, is currently considered a HLW form even though less than 5% of its liquid volume originated from the reprocessing of spent fuel. Should the SBW require disposition as HLW, additional waste processing could be required to meet a yet-to-be-approved future waste form acceptable at the yet-to-be-developed permanent geologic repository.

Also at Idaho, there are 4,400 cubic meters of calcined waste resulting from the reprocessing of spent nuclear navy fuel. This material was derived from the calcination of liquid HLW and converted to a powdery form and placed in the HLW binsets prior to the shutdown of the calciner facility. Today, this waste is considered orphaned because it is not in a borosilicate glass waste form required for disposal at the designated (or at least reference) deep geologic repository at Yucca Mountain. Also, it is currently not considered acceptable for WIPP under the WIPP Land Withdrawal Act (LWA) because it has been managed as HLW. However, as a waste form, it is well suited for WIPP. Current baseline plans call for the adjacent IWTU to be modified to package the waste for transportation to the yet-to-be-developed HLW repository. Development of a WIPP option for these two wastes would eliminate the need for future capital construction activities, regulatory and licensing changes related to the non-glass waste form and indefinite storage at Idaho.

DOE needs to think big in implementing policy update

Even while DOE's policy update is likely to espouse the risk-informed classification and management of its waste streams going forward, it will take significant and sustained DOE leadership to ensure that host states and communities are informed of the plans and that its sites fully implement this nuanced policy shift. The change should not be limited to the small volume waste challenges that exist at several sites, but must be used to revisit the

basics of some of the largest volume waste streams—the very streams and projects that contribute most to the lifecycle cost and schedule for the EM program.

At Hanford alone, a large fraction of the tank waste could be dispositioned in a form other than glass, and low-temperature treatment alternatives would produce contact-handled (CH) TRU or LLW streams. These multiple pathways potentially eliminate the need to build a supplemental low activity waste (LAW) treatment plant, which is necessary to complete the waste mission. Initially, separated LAW could be treated commercially and disposed off-site (out of Washington State) in commercial disposal facilities. It is projected this optimized approach could begin treatment and disposal of some Hanford tank waste within 2-3 years, even as the Low Activity Waste Pretreatment Facility is constructed.

At Savannah River, as many as 2,300 (30%) of the vitrified tank waste canisters in storage awaiting Yucca Mountain or a replacement HLW repository can be instead compliantly characterized as TRU wastes acceptable for current geologic disposal at WIPP. This would reduce the inventory of wastes requiring indefinite storage at Savannah River, and likely negate the need for construction of additional canister storage capability. However, Yucca Mountain or its replacement repository will still be needed to accommodate the remaining 70% of the vitrified canisters.

DOE should also be vigilant to ensure that only waste that must be managed as TRU waste is shipped to WIPP for disposal to make optimal use of the facility's limited capacity. That is, wastes that can be processed and/or packaged to enable disposal as LLW should be compliantly dispositioned at an appropriate LLW disposal facility.

DOE has the authority but does not act

To be clear, DOE has the authority today to implement these significant improvements in its waste management plans. To date, DOE has simply lacked the will to implement its authority in the face of opposition or concerns of litigation. The needed and recommended update to DOE Order 435.1 will likely signal to these groups DOE's intent to exercise its authorities at last. DOE should anticipate that some groups will not embrace this move and will file lawsuits to prevent such actions. Congress' enactment of proposed statutory clarification would mitigate these actions and institutionalize the change.[3] Notwithstanding DOE's litigation concerns, its continued acceptance of a status quo or laissez-faire approach will result in continued EM life cycle cost escalation.

[3] See Appendix A on page 33 of this report to review legislative language proposed by the Savannah River Site Community Reuse Organization.

Statutory change needed to validate DOE's authority

Any change to DOE's established program plans, especially at Hanford, is likely to result in legal challenges from one or more groups. It is important to note that while waste determinations have been made without legal challenge at sites like West Valley, the last significant attempt to move forward with waste determinations at Savannah River and Idaho under DOE Order 435.1 was met with a significant legal challenge in the early 2000s. The protracted legal fight ultimately was not resolved with a court ruling—an appeals court ruled the issue was not yet ripe for consideration—but rather a statutory remedy from Congress. In Section 3116 of the Ronald Reagan National Defense Authorization Act of 2005, Congress established criteria for determining that some waste from spent fuel reprocessing is not HLW and may be disposed of on-site at the Savannah River Site and the Idaho National Laboratory. The Hanford Site, however, was not included in the provisions of Section 3116 because the state of Washington explicitly is not covered or bound by the section.[4]

In moving forward, Congress should undertake a limited statutory clarification within the National Defense Authorizations (or other appropriate bill) to emphasize current authorities and direct DOE to manage waste based on its radiological characteristics, rather than solely on its origin or historical classification. ECA recommends that DOE provide resources in order for local and state hosts of DOE facilities to work together to develop legislative language to ensure any change in how waste is defined remains in place as priorities and politics shift over time. Proposed language introduced by the Savannah River Site Community Reuse Organization is outlined in Appendix A.

Re-definition of HLW not needed

Admittedly, it could be confusing that while some waste may not require "permanent isolation," by virtue of a determination that it does not contain a sufficient concentration of fission products to be classified as HLW, it may still be disposed and permanently isolated in a geologic repository (WIPP) after appropriately being classified as TRU waste, consistent with the definition for TRU waste within the WIPP LWA.[5] It is possible that wastes that meet

[4] There is an opportunity here to take advantage of lessons learned. In retrospect, many in Washington State believe that had there been more education, outreach, and engagement with key stakeholders, the state might not have been excluded.

[5] (18) TRANSURANIC WASTE – The term "transuranic waste" means waste containing more than 100 nanocuries of alpha-emitting transuranic isotopes per gram of waste, with half lives greater than 20 years, except for (A) high- level radioactive waste; (B) waste that the Secretary (of Energy) has determined, with the concurrence of the Administrator (of EPA), does not need the degree of isolation required by the disposal regulations; or (C) waste that the Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with Part 61 of the Code of Federal Regulations. *WIPP Land Withdrawal Act as Amended*.

the definition of TRU wastes would also meet the definition of HLW if not for the specific exclusion of HLW within the TRU waste definition. This is because the HLW definition is rooted in origin and the radiological concentrations for the classification have never been quantified.

It may be more straightforward, as suggested by some, that the HLW definition be revised and quantified in a manner similar to TRU wastes. And given the authority DOE already has, such a significant and time-consuming regulatory undertaking is not necessary to support efforts to optimize its waste management policies and accelerate progress toward the removal and permanent disposal of large portions of its stored waste inventories. Therefore, ECA supports the clarifying direction, rather than a re-definition of HLW.

Any legislative language would need to support DOE's efforts to clarify that, irrespective of origin, any wastes meeting the quantified definition of defense TRU waste can be compliantly disposed at WIPP or any such private permitted facility, and any wastes meeting the definition of LLW can be disposed in LLW disposal facilities. This would result in an immediate path forward for much of the tank waste inventory to be disposed permanently. It is time to quit pumping waste from tank to tank within degrading tank systems, and spending hundreds of millions of dollars overseeing waste when it can safely and cost effectively be disposed, ending the risks, liability and excessive outlay of taxpayer dollars.

3.0 OPTIMIZE WIPP AND OTHER EXISTING DISPOSAL FACILITIES AND CAPABILITIES

Given the time and effort required to affect changes at WIPP and within its regulatory permits, DOE must immediately take near term actions and decisions related to WIPP in order to take advantage of the policy and statutory clarifications.

Sustained, adequate funding at WIPP is needed

First, it is vital that the Administration seek, and that Congress provide, sufficient funding to support the timely completion of the new shaft, ventilation upgrades, hoist capabilities and operational resources needed to support a return to full capacity operations at WIPP. DOE should update its five-year funding plan for WIPP to ensure not only full funding for the capital asset projects, but to also ensure adequate funding for recapitalization of the 35-year-old facility, operations, mining, maintenance; as well as the development of strategies, analyses, research activities, and capabilities for additional waste streams resulting from the proper classification of tank wastes.

Only upon a return to full operations (with restored full ventilation) will DOE be able to resume mining activities needed to secure adequate disposal capacity for the remaining stores of legacy defense TRU wastes; thus recovering the capacity lost due to the 2014 WIPP incidents. While limited capacity is available for a portion (approximately 20%) of contact-handled (CH) TRU waste awaiting shipment throughout the DOE complex, additional capacity and increased ventilation must be in place before remote-handled (RH) TRU waste shipments can resume. Until then, the RH-TRU waste inventories at Idaho, Oak Ridge and Savannah River will remain at these sites in interim storage indefinitely, despite regulatory requirements and programmatic impacts. Additionally, continued emplacement of CH-TRU waste without ongoing emplacement of RH-TRU waste results in the loss of RH-TRU disposal space in the walls of emplacement rooms. This results in the need for further excavation to recover disposal space, but also argues for the maximized use of the shielded canister assemblies to enable some RH wastes to be disposed in a configuration similar to CH wastes (on the floor of the rooms rather than the boreholes in walls).

DOE must increase and sustain CH-TRU waste shipping and emplacement operations to complete the legacy TRU shipments from Idaho, Oak Ridge, Savannah River and Los Alamos. Those DOE sites are the ones most immediately and significantly impacted by curtailed operations at WIPP. This recovery is needed to mitigate the further increase in costs of regulatory noncompliance and extended storage beyond project baselines. It is also needed to restore full stakeholder confidence in the repository and its capabilities now and in the future. However, it must be recognized that without recapitalization funding for WIPP there

will be constant interruptions and delays to shipments when WIPP's equipment and infrastructure fail.

Stakeholder confidence is needed to propel progress toward increased use of WIPP's unique capacity and the methodical expansion of WIPP's mission to address other existing legacy inventories, including surplus plutonium, non-defense TRU wastes, and portions of DOE tank wastes determined to be other than HLW waste based on their radiological characteristics consistent with policy and statutory clarifications.

Table 1: Additional TRU Streams Suitable for Disposal at WIPP

Waste Stream/Site	Site benefit
Non-Defense TRU Waste	
West Valley	Provides disposal pathway for otherwise orphaned waste stream
Tank Waste	
Savannah River Site	Expedites removal of curies from SRS and reduces need for additional on-site storage capacity
Idaho	Implements intended TRU disposition path for treated sodium bearing waste, avoiding need for additional treatment
Hanford	Enables a number of additional tanks to be emptied and closed Provides basis for optimization of tank waste program

Transparent, integrated regulatory roadmap for WIPP

An integrated regulatory strategy is required to align DOE's plans for WIPP and secure the needed approvals by regulators and stakeholders. Unfortunately, due to the WIPP incidents, DOE has been unable to take full advantage of the strong support of the current New Mexico administration. However, there still remains strong local support to expand the mission at WIPP.

Prior to 2014, New Mexico Governor Susana Martinez had repeatedly expressed support for expansion of WIPP's mission. Despite the WIPP incidents and associated regulatory violations, the State of New Mexico has been a constructive influence in WIPP recovery efforts, including support for permitting above ground interim storage at WIPP. This support base should be leveraged to the maximum degree possible during the remainder of the Governor's term (which ends in 2018), as the political climate in the state could change significantly.

DOE's ability to secure New Mexico's continued support may be strengthened only if a clear and technically defensible strategy can be shared with the public. Disparate efforts and projects associated with WIPP create considerable confusion and conflicting priorities, thus eroding public support and making DOE increasingly vulnerable to challenges by WIPP's long-standing opponents.

As an example, the on-going debate regarding the viability of Mixed Oxide Fuel (MOX) Fabrication Facility under construction at the Savannah River Site raises expectations that all surplus plutonium can be disposed at WIPP, rather than converted via MOX to commercial spent fuel. Similarly, DOE published its Final Environmental Impact Statement (EIS) for Disposal of Greater Than Class C (GTCC) Low Level Waste and GTCC-Like Waste (DOE/EIS-0375) in February 2016, which identified use of WIPP for disposal of a portion of the inventory, including non-defense TRU wastes, within the Preferred Alternative. These efforts, if not coordinated, could impair other needed WIPP permitting efforts. It is imperative that DOE communicate consistently on its priorities for use of WIPP and the associated timing for these priorities.

ECA urges DOE to immediately develop and make public a programmatic and regulatory roadmap for WIPP.

ECA urges DOE to immediately develop and make public a programmatic and regulatory roadmap for WIPP, underpinned by the updated analysis of the disposed volumes to date, relative to the current statutory capacity for WIPP of 6.2 million cubic feet (approximately 175,500 cubic meters). This analysis should identify any permit changes necessary to make optimal use of the existing statutory capacity, it should present alternatives for the priority use of the remaining capacity, and it should outline recommendations for increases to the capacity to accommodate DOE waste streams targeted (current and future) for disposal at WIPP. The roadmap should also set forth the benefits to the nation for implementing such a plan and using a national asset like WIPP.

DOE should also negotiate benefits with the State of New Mexico and the local communities related to expanding the WIPP mission and disposing of additional waste. Such an approach would be reasonable and rational for the state, reduce stakeholder issues and be less costly than looking for or developing other alternatives related to waste disposition.

Removal of tank waste exclusion a must in the WIPP permit

The WIPP roadmap should identify and prioritize all permit modification requests (PMRs) needed to implement the infrastructure changes at WIPP necessary for full operations (ventilation, above ground storage, operations), as well as those needed to receive all legacy TRU wastes within the DOE complex. Primary among these is the update and resumption

of the PMR to remove the prohibition for receipt of tank wastes at WIPP, which DOE originally submitted in 2013. In July 2013, then-Secretary of the New Mexico Environment Department (NMED), Ryan Flynn, determined that the PMR would be processed as a Class 3 modification request due to significant public interest. However, no regulatory action has been taken on this request since the 2014 WIPP incidents.

DOE's 2013 PMR to modify the WIPP excluded waste prohibition proposed to prohibit only waste meeting the definition of HLW under the WIPP LWA, which incorporates the NWPA definition of HLW[6]. Therefore, the PMR must be revised to be consistent with the proposed statutory clarification of the NWPA HLW definition. This will ensure any tank wastes DOE determines to meet the definition of TRU waste – based on radiological characteristics rather than origin – are accommodated by the permit change. It is strongly recommended that DOE initiate communications with NMED on this PMR as soon as possible and begin drafting the Class 3 PMR to remove the prohibition for receipt of tank wastes. The Class 3 PMR process will include pre-submittal meetings, a mandatory 60-day public comment period, formal public meetings and the opportunity for the public to request a public hearing.

The balance of DOE's regulatory roadmap for WIPP should summarize the nature and timing of each PMR to be sought, such that NMED can plan resources required for their review and any public comment processes. This schedule should balance the priority of those PMRs needed for the return to full operations with those that advance DOE's broader strategic goals for WIPP. Further, the schedule should be sufficiently aggressive to seek the most critical PMRs during the current New Mexico administration. Proactive coordination with the US Environmental Protection Agency, the certifying authority for WIPP, will be necessary to mitigate any perceived conflicts with their regulatory purview and to secure its support for adding additional waste streams to the WIPP-bound inventory. Pursuit of these actions would enable the disposition of up to 20 tanks of TRU waste resulting from defense-related operations at Hanford.

DOE should provide adequate funds to NMED to support processing the permit modifications in a timely manner, especially given that NMED's ability to review and approve permit modifications has been hampered by the loss of key regulatory staff and budget constraints.

In parallel with DOE's regulatory strategy, DOE and Congress must partner in identifying the needed modifications to the WIPP LWA to align with any clarifications to the definition of HLW, to increase, if necessary, the statutory capacity, and to authorize disposal of non-

[6] HIGH-LEVEL RADIOACTIVE WASTE— The term "high-level radioactive waste" has the meaning given such term in section 2(12) of the Nuclear Waste Policy Act of 1982 (42 U.S.C. 10101(12)).

defense TRU wastes. This would result in a final disposition path for approximately 650 cubic meters of non-defense TRU waste at sites like West Valley.

Defining "Volume of Record" is critical

While the expansion of WIPP's regulatory volume is being accomplished, it is critical for the definition of WIPP's "Volume of Record" to be clarified. Since WIPP began operations, DOE has recorded disposal volumes based on the volume of the emplaced waste container, rather than the actual volume of the waste contained within it. That is, each container is counted as though it is 100% full, irrespective of the volume of waste within it. This is grossly inaccurate because some waste streams contain fissile contents that necessarily require each volume per package to be greatly limited. Also, some containers are "over packed" for shipment purposes, and the over pack contains a significant amount of air; some inner waste packages, such as pipe containers within a drum, comprise as little as 10% of the volume of the drum. As a result of over-estimating the disposal volume based on package capacity rather than content, an estimated 32,000 cubic meters of capacity has been unnecessarily recorded as utilized. The present gross volume of disposed waste in WIPP is now counted as 92,000 cubic meters, whereas the disposed actual waste volume is approximately 60,000 cubic meters. The WIPP LWA defines WIPP's regulatory volume as "waste," NOT air. In order to preserve, plan and efficiently use the present valuable WIPP regulatory volume, a clear definition of WIPP's "volume of record" must be made.

Integrated WIPP operations planning

The process by which DOE updates its Annual Transuranic Waste Inventory Report provides an existing mechanism for integrating information related to these efforts. DOE should ensure the pending annual update incorporates all potential tank wastes that may be determined to be TRU by radiological content, as well as other additional WIPP-bound wastes. This report is critical to tracking the use of the remaining statutory capacity at WIPP, aligning DOE's inventory information with the two regulatory agencies, and documenting the waste inventory analyzed in WIPP's performance assessment.

DOE sites and communities would benefit from an updated, summary schedule for future WIPP operations, which incorporates:

- The planned ramp up in CH-TRU operations;
- The specific plan for the resumption of RH-TRU operations;
- Planned mining activities;
- Construction of the new shaft and ventilation system;

- Permit approvals;
- Initial acceptance of new waste streams; and
- Planned outages to accommodate infrastructure improvements, such as the waste hoist repairs.

Using this schedule, DOE will be able to engage with political leaders, host communities and stakeholders to communicate the relative priority of various waste streams and shipping campaigns, and to outline any required changes to operational plans, regulatory resources and negotiated agreements. This would also provide an opportunity to gauge community support for an expanded WIPP mission and to perhaps introduce the concepts of host benefits for accepting an expanded mission for other wastes. Such community interactions can build support for favorable changes to the LWA, new WIPP missions and the negotiation of potential host benefits.

Planning for future WIPP missions beyond TRU waste disposal

While the activities discussed above focus on making optimal use of WIPP for disposal of waste confirmed as TRU waste, DOE should also focus on resuming efforts to evaluate and demonstrate the feasibility of using WIPP for disposal of other long-lived radioactive defense-origin waste streams. While the Administration plans to resume the Yucca Mountain Project, it remains uncertain when/if Congressional support will coalesce to provide the needed appropriations. Also, it is likely that decades will be required to complete the needed licensing, permitting, construction and commissioning of the new geologic repository. Furthermore, there is insufficient capacity within the Yucca Mountain authorization basis for the volume of DOE's defense HLW streams, as well as insufficient accommodation within the Yucca Mountain License Application for their diversity (i.e., the License Application includes only borosilicate glass waste forms). Additionally, the NWPA requires DOE to eventually site a second geologic repository.

WIPP, originally conceived as a potential HLW site, is an obvious candidate as a second HLW repository. The community in southeastern New Mexico has demonstrated itself to be highly informed and supportive of future nuclear missions in the area. DOE should leverage this support and the availability of the WIPP repository environment, to undertake scientific tests to evaluate the feasibility of disposal of heat-generating wastes. Specifically, DOE should incorporate the previously planned heater test (Salt Defense Disposal Investigation) within its broader plans for mining and operation to support its TRU waste missions. This test should be planned and conducted in sufficient time to inform any design alternatives considered for conduct of WIPP's current mission.

The heater test is not necessarily required to support the near-term decision to dispose of tank wastes that are determined to be TRU waste in accordance with the clarified policy and statute. However, there are obvious logistical ties and efficiencies between the two efforts. The transport, storage and emplacement of some TRU tank wastes will be nearly identical to that required for HLW canisters. These transportation and logistics developments will greatly inform the related and ongoing efforts within DOE's Office of Used Fuel Cycle Research and Development. Also, the heater test, if implemented aggressively, could provide scientific data that demonstrates wastes with considerable greater heat load than TRU waste can be safely isolated at WIPP, building stakeholder confidence in DOE's decisions to dispose of other types of waste there.

In the event DOE conservatively elects to perform the heater test prior to disposing of any vitrified wastes at WIPP, irrespective of their TRU classification, a pilot project for transportation and interim storage of such canisters such as those at the Savannah River Site should be pursued in parallel with the heater test. The pilot project would demonstrate logistics and material handling and would be conducted with low heat, low curie vitrified wastes determined to meet the definition of TRU wastes.

These phased actions are necessary to ensure DOE makes optimal use of WIPP, the nation's only existing, and operating geologic repository. Given the ever-increasing life-cycle cost of the EM program, as well as increasing DOE stakeholder concerns associated with delays in the Yucca Mountain project, these steps will demonstrate to the American taxpayers some ability to stem the otherwise uncapped cost growth. These actions will finally enable DOE to fulfill its commitments to the host states and communities that a pathway will exist for all of the radioactive wastes and materials generated in the past 50 years. Without such action, the host sites and communities become de facto interim storage sites with large volumes of orphaned wastes, without any of the intrinsic financial benefits intended to come with being an interim storage site host.

Optimizing use of other existing treatment and disposal facilities

Disposal alternatives for long-lived radioactive wastes are today limited to WIPP. At present, there are no disposal alternatives for commercial TRU waste or for HLW. There are, however, established outlets for lower activity, LLW and mixed LLW (MLLW) streams, including, potentially, for some GTCC LLW. The viability of these commercial facilities is critical to DOE's efficient waste management strategies as well as commercial waste generators and the host communities.

Commercial LLW capabilities have grown in the last two decades, in many cases adjacent to or in direct support of DOE cleanup sites. Commercial facilities were critical to several of

DOE's past projects in the early 2000s. These projects included treatment and disposal of large volumes of waste streams to enable the closure of Rocky Flats and Fernald. These facilities also enabled replacement polychlorinated biphenyl treatment capabilities enabling the closure of the aged Toxic Substances Control Act Incinerator. Yet DOE's use of these facilities has been much more limited in the last decade due to budget constraints and other factors. Several of these facilities have curtailed and/or ceased operations, and others are experiencing increased unit costs due to a declining customer base directly impacting continued operational and financial viability.

DOE Order 435.1 provides for use of commercial capabilities when DOE demonstrates it to be both cost effective and in the best interest of the government. These decisions have been delegated to the Field Managers, who understandably consider and make these determinations in a site-centric, rather than complex-wide, manner. Yet, DOE must ensure the sum of these site-centric decisions does not result in the loss of needed treatment and disposal capabilities; a complex-wide view is warranted to ensure the decisions are informed and consider life-cycle impacts. For example, there are three new on-site disposal facilities planned to receive facility deactivation and decommissioning (D&D) wastes at DOE's Oak Ridge, Portsmouth and Paducah sites. While there may be valid reasons for each to be constructed, DOE's plans for each new facility should be carefully evaluated to ensure that the use of existing facilities was considered to reduce their cost and schedule and to consider the life-cycle benefits of ensuring availability of existing facilities.

Further, DOE needs to do a careful cost benefit analysis of transportation of LLW to commercial sites versus design, licensing, permitting, construction, operation, closure and legacy monitoring of on-site disposal facilities. To date DOE use a more intuitive approach indicating that transportation is costly as compared to "on-site" disposal. What is rarely, if ever, factored into the analysis is the delay time (often caused by DOE's inability to get community acceptance for the action) in getting the on-site disposal facility operational, closure costs and long-term legacy management. These costs are not generally considered by the DOE sites because they extend beyond the project's near-term horizon. However, these facilities have long-term legacy costs that can be better addressed through consolidation at commercial sites. It is for this reason that commercial nuclear utilities do not dispose of their radioactive wastes on their own sites but rather in commercial disposal facilities.

Commercial disposal facilities also play an important alternative for larger volume waste streams, especially those that can be shipped by rail. The availability of commercial alternatives has been a key consideration for Nevada regulators who are concerned with excessive use of the DOE disposal facility at the Nevada National Security Site for disposal of offsite wastes.

In regard to treatment of mixed LLWs (those LLW streams contaminated with hazardous chemicals), past practice has demonstrated commercial treatment is consistently cheaper than DOE's costs to construct, operate, maintain and eventually decommission treatment facilities to address these MLLW streams. Some commercial facilities have been able to leverage their permitted capabilities to also handle DOE TRU and high fissile gram wastes, obviating the need for other onsite treatment capabilities. In addition, existing commercial treatment capabilities in Washington and Tennessee have enabled processing of large package wastes, reducing or potentially eliminating the need for new capital line item projects to be funded at these sites. This, coupled with off-site disposal at commercial facilities as discussed above, provides the DOE with a complementary alternative to on-site treatment and disposal, which involves years of engineering, design, construction, commissioning, operations, and decommissioning.

Therefore, DOE should conduct an evaluation of the availability and use of commercial radiological treatment and disposal facilities. The evaluation should consider the impact to DOE's current baseline plans should the commercial facilities cease to be available and to definitively identify the current and potential capabilities that these facilities provide. This analysis should consider that competition drives cost efficiency, and that a healthy commercial market will support not just DOE but also civilian nuclear efforts. The evaluation should consider all of the DOE costs that will be incurred for new facilities, not just capital and operating costs, but the on-site storage costs and schedule impacts incurred while sites wait for the needed facilities to come on line. Decommissioning and legacy costs as well as operational costs for permit, facility and equipment maintenance and compliance should be considered in the analysis.

It should be noted that DOE must preserve and optimize its own disposal facilities, to the extent accepted by the community, to ensure capacity irrespective of commercial market changes and to safely manage those unique waste streams that require federal disposal. However, as DOE undertakes efforts to reduce the cost and schedule of its cleanup efforts, as called for by the GAO's recent report, serious consideration should be given to those alternatives that utilize existing commercial facilities. Doing so will help stabilize their business and contribute to lower unit costs, which could stimulate greater cost savings down the road. This approach also supports the communities and states that host these commercial sites.

4.0 DOE NEEDS TO ACT NOW ON PILOT PROJECTS AND OTHER NEAR-TERM WASTE MANAGEMENT INITIATIVES

As DOE initiates this significant change in policy and considers WIPP for an expanded mission, it is important that DOE pursue targeted pilot projects and near-term waste management initiatives in parallel with the policy effort.

Pilot projects allow DOE to both demonstrate the feasibility of the risk-based approach and engage the host communities, states, regulators, and other stakeholders to obtain public understanding and feedback prior to making longer term, farther reaching programmatic decisions. Pilot projects also enable DOE and regulators the opportunity to collaborate, develop and socialize technical justifications and waste determinations that must be made for specific waste streams; and to support alternative treatment and disposal approaches. Once developed, pilot projects yield data needed for meaningful stakeholder discussions and to advance and inform policymaking.

ECA believes the specific pilot projects and near-term term waste management initiatives outlined below should be given priority and pursued as soon as possible, but not necessarily in the order provided. All of these initiatives have the potential of a high return on investment relative to reducing lifecycle costs and schedules for DOE's EM program and many will result in removal of unneeded conservatism from current plans. Some will require a longer time to implement and are included as a near-term priority to simply initiate the process. Others can be implemented immediately. By design, this list of initiatives ensures benefits are realized throughout the DOE complex and targets progress at as many DOE sites as possible.

1. Hanford Low-Activity Waste Test Bed Initiative

The Hanford Test Bed Initiative (TBI) is a three-phase effort designed to demonstrate the feasibility of treatment, solidification and off-site disposal of small quantities of low-activity waste from the Hanford tank farms. The approach involves an increasing amount of Hanford tank waste—three gallons in phase one, 2,000 gallons in phase two and 100,000 gallons or more in phase three. The TBI is designed to demonstrate the commercial treatment and off-site disposal of Hanford LAW as a supplemental treatment approach to the current baseline of LAW vitrification and on-site disposal. The TBI's purpose is to use a phased approach to demonstrate the technology for waste treatment, and to identify needed regulatory analysis and approvals, commercial capabilities, and the ability to safely transport and dispose of stabilized tank waste off-site.

The TBI effort is currently on hold in the midst of the first phase. Three gallons of LAW have been prepared and the needed WIR determination has been performed and approved, but DOE has placed a hold on the off-site treatment and disposal. Continued progress on the TBI is important to lay the foundation for future DOE decisions regarding the potential for treating, stabilizing and disposing of Hanford LAW in a form other than glass. If the test proves successful, the concept could allow tank closures at Hanford to be dramatically accelerated, reducing cleanup costs by billions of dollars and resulting in decades of schedule improvement. It would immediately open an alternative path for the treatment and disposal of Hanford LAW using existing, licensed, commercial treatment and disposal facilities —without the need for a newly constructed treatment facility or additional capital facilities which are currently reflected in the Hanford tank waste baseline.

The phased approach is prudent and rational. It allows the DOE, regulators and stakeholders to collaborate, monitor and work through particular issues associated with commercial treatment and off-site disposal of LAW. The estimated cost for Phases 1 and 2 of the TBI is less than $15M over the next two years. The cost for Phase 3 is determined by the volume of LAW to be treated and disposed. If successful, the return on the TBI investment is extraordinarily high for DOE.

While the simplicity of the approach may make it tempting for DOE to immediately jump to a higher volume demonstration project from the start, the phased approach should be followed to its conclusion to demonstrate use of existing regulations and to allow phased monitoring and input from regulators and stakeholders. This will help inform the DOE relative to future programmatic decisions and direction at the completion of the TBI demonstration.

2. WIPP 'Heater Test'

In order to support future DOE waste management decision-making, the Department should resume the so-called 'Heater Test' at WIPP to examine how higher-heat defense wastes would perform in a generic salt repository such as WIPP. While some work in this area was begun during WIPP's development three decades ago, a comprehensive testing effort is needed to fill in gaps and provide validation of existing data.

A complete set of technical data is important for DOE, regulators and stakeholders to have as it pursues decisions about HLW and other higher-heat defense waste, regardless of the ultimate disposal decision. This testing effort, which will take time to plan, implement and record results, should be a high priority for DOE.

3. Hanford TRU Tanks Classification

In its Final Tank Closure and Waste Management EIS for the Hanford Site, Richland, Washington (DOE/EIS-0391), DOE identified 20 tanks containing approximately 3.1 million gallons of waste that may be properly and legally classified as TRU waste, though they have traditionally been managed as HLW. No change in interpretation of the definition of HLW is needed. Preliminary analysis concludes the waste was not created during the reprocessing of spent fuel and was never mixed with HLW. While the technical analysis supporting a decision to treat waste in those tanks as TRU waste has been completed, the classification and determination of these tanks as TRU wastes has not been formally documented and announced by DOE.

The Department should move to finalize the TRU waste determination now, and fund the project, so that it is ready to move forward with disposition once the permit modification removing the tank waste exclusion at WIPP is approved.

4. Idaho Sodium-Bearing Waste Determination

Approximately 900,000 gallons of SBW is stored in three underground tanks at the Idaho site. Historically, the waste has been managed as HLW waste. Past DOE analysis has concluded the radioactivity of the waste is significantly below HLW and spent fuel. In fact, the waste likely meets requirements to be disposed as TRU or low-level waste. It will be treated to a waste form that was selected to meet the WIPP waste acceptance criteria.

Under its existing authority, the Department can make a Waste Incidental to Reprocessing (WIR) Determination that would permit the SBW to be disposed of as other than HLW, and yet it has not done so. However, if DOE Order 435.1 revision is approved as planned, a WIR Determination will not be required. Rather, a TRU waste determination can be made, demonstrating the acceptability of the treated waste at WIPP.

DOE should immediately document its plans for the disposition of the SBW as TRU waste so that it is ready to move forward with disposition at WIPP once the waste is safely treated and packaged and the permit modification removing the tank waste exclusion at WIPP is approved.

5. Disposition of SRS vitrified waste as TRU waste to WIPP

As noted in Section 2, a significant portion of the inventory of vitrified tank wastes at Savannah River Site, as many as 2,300 canisters, currently meet the definition of TRU waste and can be safely disposed at WIPP, even in advance of or without the results of the WIPP Heater Test or used as part of the heater tests. This is because the early treatment campaigns of the Defense Waste Processing Facility treated tanks wastes that contained limited concentrations of fission products. As is the case with other tank wastes, a WIPP permit modification removing the tank waste exclusion at WIPP is required. Further, portions of DOE's vitrified waste inventory should also be evaluated for immediate disposition at a LLW near-surface disposal facility. Feasibility of disposal as TRU or LLW will be dependent on the needed DOE Order 435.1 revision and demonstration that disposal site license requirements and waste acceptance criteria are met.

6. Record of Decision on Greater-than-Class-C Low-Level Waste

Despite Congress' direction in the Energy Policy Act of 2005 (EPACT), DOE has spent over 10 years preparing the GTCC LLW EIS[7]. It was published in February 2016, but DOE has yet to develop and submit to Congress the required report on the alternatives evaluated. The preferred alternative for the disposal of GTCC and GTCC-like waste is WIPP and/or generic commercial facilities. Per the EPACT, DOE must await Congress' direction in response to this report prior to issuing a Record of Decision and designating a specific facility or facilities.

Presumably, Congress contemplates some statutory change to support DOE's implementation of the Preferred Alternative, including either modification to the WIPP LWA to authorize disposal of non-defense wastes, or clarification that commercial facilities not regulated by the NRC can be licensed by Agreement States for disposal of GTCC. DOE should proceed immediately to provide Congress the Congressional report required by EPACT on the alternatives evaluated and begin to work with Congress on the needed statutory changes to implement the Preferred Alternative. Given the inclusion of commercial facilities within the Final EIS and its Preferred Alternative, the NRC must complete its prolonged efforts to modify the regulations for near surface disposal of LLW (10 CFR Part 61).

[7] DOE announced the availability of the *Final Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste* (DOE/ EIS–0375) in the Federal Register, Volume 81, Number 43, on March 4, 2016.

7. Clarify Pathway for Molten Salt at Oak Ridge

While not a near-term priority for the Oak Ridge site, the molten salt there is a waste resulting from an experimental reactor that utilized it as its fuel source. Molten salt is unlike other spent fuels and, as such, has no viable pathway to Yucca Mountain or any replacement HLW repository. However, it can be safely packaged and classified as TRU waste for disposal at WIPP. The clarifying statutory language will provide a foundation for the disposition of this one-of-kind waste, which is currently orphaned.

8. Decision on Depleted Uranium Disposition

The NRC has been working for over a decade to promulgate a rule-making to clarify the appropriate LLW classification for depleted uranium. DOE can, and has, safely disposed of depleted uranium wastes at the Nevada National Security Site in the past. There is also a commercial facility being fully licensed to accept DOE's depleted uranium as LLW. However, DOE has not proceeded with the requisite National Environmental Policy Act (NEPA) analysis to determine its disposition path.

DOE should immediately complete the Supplemental EIS to evaluate and select a disposition path for the converted depleted uranium hexafluoride cylinders in storage at the Paducah and Portsmouth sites. This waste stream can safely be disposed in existing government or commercial facilities. Should commercial disposal sites be selected by NEPA evaluation and ensuing Record of Decision, this large volume waste stream could have a stabilizing effect on the commercial disposal market in the near term.

9. Explore Options for Clean Metal Release

Opportunity exists for DOE to remove the conservatism from its metal management policies. Due to decades long opposition by a limited public interest group, DOE has suspended the release from regulatory control, all scrap metals from radiologically posted areas (rad areas). This means clean metals perfectly suited for recycle and reuse have been either stored indefinitely or disposed as radioactive wastes, at significant cost to the American taxpayers.

Identical metals from commercial nuclear industry – both in the US and internationally – are routinely surveyed, determined to be free of contamination or contain sufficiently low levels of residual contamination to be free-released and reused. DOE should resume the efforts to publish the Environmental Assessment developed under the prior Administration and proceed with a policy directive authorizing DOE

program offices to implement the necessary property management programs to certify clean metals from rad areas for free release.

This initiative is important to avoid contradictions within EM's revised waste management policy and actions, including those above. Any actions to remove conservatism from disposal decisions involving long-lived radioactive wastes will be open to challenge if the same agency avoids free release and disposal of non-radioactive metals simply due to public misperceptions that the metals pose a risk.

5.0 COMMUNITIES BENEFIT FROM A COMPLEX-WIDE STRATEGY

A comprehensive, complex-wide waste management strategy that is based on a shared understanding of risk would allow virtually all sites and host communities to benefit through clear progress, additional investment and final waste disposition. While clarifying the definition of HLW would have the most dramatic impact at Hanford and Savannah River, moving forward on a risk-based waste management strategy would have clear benefits across the complex.

It's important to note, however, that transparency is paramount to the communities' ability to trust and support DOE efforts. These efforts must be pursued with full engagement with the host communities, including town hall meetings, clear metrics to demonstrate progress and published summaries of radioactive waste disposition efforts to guide the dialogue throughout implementation.

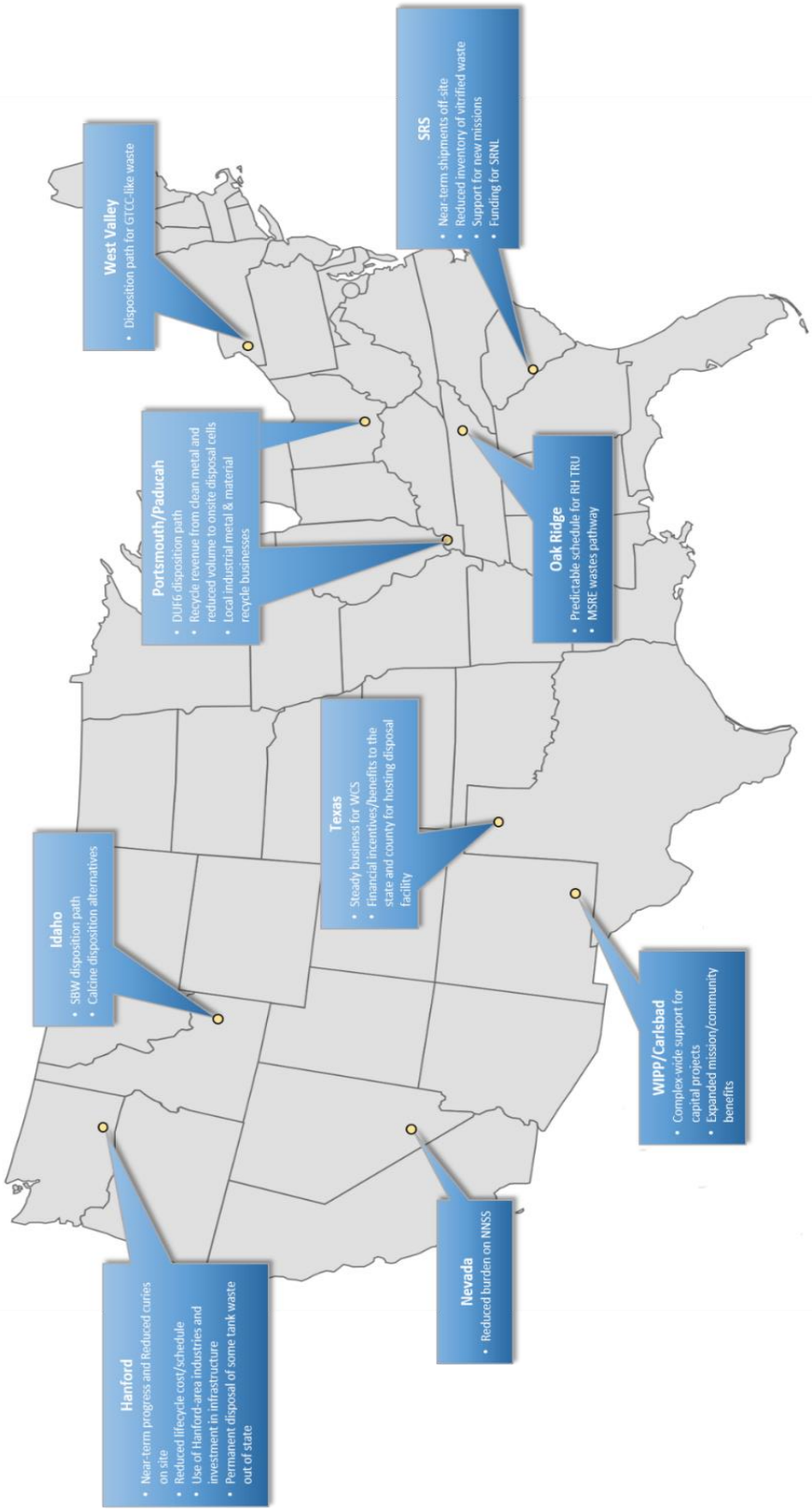
The local communities that host DOE sites are the ultimate 'customer' in the cleanup process and it is critical that the Department engage appropriately with elected officials and other community groups early and often as part of the planning for the waste disposition efforts. Local communities can often help coordinate more effectively with State and other oversight/regulatory bodies to deal with regulations and other requirements that may be overly burdensome or result in skewed priorities that get in the way of completing these cleanups as efficiently as possible.

It also behooves DOE to be aware of and sensitive to the costs borne by local communities as they strive to be good hosts. Community planning for everything from infrastructure like roads, bridges, stoplights and the provision of fiber optics to sites, to educational concerns like school expansions or closures can be impacted by the quality and duration of the cleanup effort.

For host communities and states impacted by expanded missions or unreasonably long delays in clean up, DOE should consider the negotiation of host benefits. This is particularly recommended for communities that may be impacted by the permanent disposal of new waste streams (e.g. WIPP) or those that cannot see an end to the long-term storage on-site of materials destined for disposal in Yucca Mountain. ECA believes DOE needs to be ready to help these communities offset the impacts of waste remaining on site in their communities beyond the timeframe originally envisioned.

Although not comprehensive, Graphic 1 highlights just some of the potential benefits for each major site based on the recommendations in this white paper.

Graphic 1 Benefits for Each Site and Community



6.0 RECOMMENDATIONS

In order to bring about much-needed changes in how the United States deals with its radioactive waste portfolio, ECA recommends DOE take five important near-term actions:

1. **Revision of DOE Order 435.1 and statutory clarification by Congress of HLW definition are a necessary one-two punch to create the regulatory and legal environment in which an integrated waste management effort can succeed in an expedited manner.**
    - DOE and Congressional action must proceed in parallel, with a statutory change providing legal affirmation to expedite DOE action.
    - Local and state hosts should immediately begin working together and with DOE to develop legislative language that will institutionalize the clarification to how waste will be defined.
    - Failure of Congress to act may delay implementation for several years.

2. **An integrated regulatory strategy is required to align DOE's plans for WIPP and secure the needed approvals by regulators and stakeholders. An immediate priority should be securing a permit modification to remove the prohibition for receipt of tank wastes at WIPP.**
    - The roadmap should identify and prioritize all PMRs needed to implement the infrastructure changes at WIPP necessary for full operations (ventilation, above ground storage, operations), as well as those needed to receive all legacy TRU wastes within the DOE complex.
    - DOE should explore mechanisms to provide financial resources to the New Mexico Environment Department to support expedited review of necessary permit modifications.
    - Full funding for WIPP capital asset projects (ventilation projects, shaft/conveyance) is needed to support optimal use of WIPP, resumption of mining to increase capacity and resumption of RH-TRU waste disposal capabilities.
    - DOE should also resume efforts to evaluate and demonstrate the feasibility of using WIPP for disposal of other long-lived radioactive defense-origin waste streams. When appropriate, DOE should request the additional funding needed to ship and dispose of the new waste streams.

3. **DOE must be transparent and meaningfully engage host communities and the broader public in the decision-making process.**
    - There must be recognition that host communities are the ultimate 'customer' and are most directly impacted by DOE policy and waste management decisions.
    - Clear metrics and annual updates are key.
    - Any strategy must show each community and state its near-term and longer-term benefits.

4. **A number of pilot projects and near-term term waste management initiatives should be given priority and pursued as soon as possible in order to better understand alternative approaches and inform future policy decisions. These include:**
    - The Hanford Test-Bed Initiative
    - The WIPP Heater Test
    - The Hanford TRU Waste Tanks Determination
    - The Greater-Than-Class-C LLW Report to Congress, followed by Record of Decision
    - A waste determination for Idaho Sodium-Bearing Waste
    - Disposition of oldest/coolest SRS vitrified waste as TRU waste to WIPP
    - Exploring options for depleted uranium disposition
    - Decision on clean metals release

5. **While waste treatment facilities currently under construction should not be suspended/abandoned, DOE should seek to optimize use of existing facilities and disposition pathways, and reassess before moving forward to construct new one-of-kind facilities.**
    - DOE should strive to avoid the construction of additional waste storage facilities at DOE sites. That is, all efforts should be made to utilize available disposal pathways.
    - DOE should conduct an evaluation of the availability and use of commercial radiological treatment and disposal facilities, to identify faster and cheaper methodologies for retrieving, treating and disposing of tank waste.

7.0 SUMMARY

The recommendations and rationale in this report will significantly reduce DOE-EM mission costs by billions and schedules by decades and deliver significant benefit to the American taxpayers. These initiatives outlined by ECA will maximize the use of existing government and commercial assets and expand/modify regulatory permits to maximize the use of existing, decades-proven government and commercial facilities and infrastructure, thereby avoiding the time-consuming delays associated with construction and D&D of new single purpose government facilities. ECA's recommendations also enable DOE to finally address problematic or currently orphaned waste streams.

Congress should urge DOE to complete the risk-informed update of DOE Order 435.1 and should undertake a limited statutory clarification to emphasize current authorities and direct DOE to manage waste based on its radiological characteristics rather than solely on its origin or historical classification.

DOE should enter into discussions with host communities and states regarding incentives for accepting expanded site missions like that at WIPP. Communities that remain as de facto interim storage sites due to government failure to complete long-term repositories should be compensated consistent with incentives that might be negotiated for interim used fuel storage facilities like those proposed by some in Congress.

The completion of the DOE-EM mission is vitally important to the communities that host government sites. Communities know the current mission budget and schedule are likely not sustainable in this time of reduced government expenditures and competing national priorities. Therefore, it is critical that affected host communities, states and regions have the resources and opportunities necessary to participate in planning, to provide feedback in the policymaking process and to remain informed of the DOE schedules and approach for completing the mission at the individual sites. This enables communities to make long-term plans and build support for DOE's mission changes and priorities. It also enables the communities to engage with DOE and their own stakeholders and affected citizens regarding land use, critical infrastructure needs and economic development consistent and in coordination with the remaining local site mission plans.

ECA urges implementation to begin as soon as possible. We look forward to continuing our support for DOE in its important mission of environmental cleanup and long-term stewardship resulting from our nation's strategic defense and nuclear energy programs.

APPENDIX A

As discussed throughout the report, the Energy Communities Alliance supports clarifying the definition of "high-level nuclear waste" in the Nuclear Waste Policy Act (NWPA) to reflect the actual composition of waste rather than the origin of the waste. ECA believes this small shift to eliminate the source component of the definition can create additional disposal pathways, expedite cleanup and save significant taxpayer dollars.

Since DOE began its second complex-wide review of its waste management practices – its efforts to update Order 435.1 – ECA members have worked to identify the role for host communities in supporting the goals we share with DOE: to remove nuclear waste as quickly and safely as possible to an appropriate location for disposal.

ECA members support a two-pronged approach with two distinct but complementary strategies:

1. An administrative approach that will use existing DOE authorities provided under DOE Order 435.1 to provide the clarity in how waste is defined.

2. A legislative approach to codify the statutory change in the legal definition.

ECA recognizes the importance of working together with DOE's stakeholders at the state and local level to build support and provide education and outreach. In addition, ECA has begun working with DOE to ensure any proposed legislative language helps and does not hinder DOE in implementing this mutually beneficial clarification.

Some communities, such as those around the Savannah River Site, have already developed legislative language consistent with the existing definition of HLW for consideration. The Savannah River Site Community Reuse Organization, for example, proposes that the text below could be placed in legislation (e.g., the NDAA or other appropriate legislation) to capture and clearly define radioactive wastes currently being incorrectly categorized:

"In order to ensure that radioactive waste is dispositioned in a safe and efficient manner and to ensure the protection of the public, workers and the environment, DOE shall consider the radiological characteristics of wastes resulting from the reprocessing of spent nuclear fuel as provided for in the statutory definition of high-level waste section 2(12) of the Nuclear Waste Policy Act. Regardless of origin or previous categorization, some reprocessing wastes shall be managed, treated and disposed of as other than high-level waste, i.e., as low-level waste, mixed low-level waste, or transuranic waste, in accordance with its radiological characteristics."

Upon characterization, DOE will effectively determine that some reprocessing wastes do not contain sufficient concentrations of highly radioactive material as to require management as HLW. Some of the wastes determined to be other than HLW will be determined to be TRU. Others wastes will be determined to be LLW.

ECA recognizes that further coordination with stakeholders and congressional delegations from the three most impacted states – Idaho, South Carolina and Washington – is needed to ensure support. All ECA members across the nuclear waste complex agree that the effort is necessary and beneficial, and does not impact the future need for Yucca Mountain.

LIST OF ACRONYMS

CH	Contact-Handled
D&D	Deactivation and Decommissioning
DOE	U.S. Department of Energy
ECA	Energy Communities Alliance
EIS	Environmental Impact Statement
EM	Environmental Management or Office of Environmental Management
EPACT	Energy Policy Act of 2005
GAO	U.S. Government Accountability Office
GTCC	Greater Than Class C
HLW	High-Level Waste
IWTU	Integrated Waste Treatment Unit
LAW	Low Activity Waste
LLW	Low-Level Waste
LWA	Land Withdrawal Act
MLLW	Mixed Low-Level Waste
MOX	Mixed Oxide Fuel
NDAA	National Defense Authorization Act
NEPA	National Environmental Policy Act
NMED	New Mexico Environment Department
NRC	U.S. Nuclear Regulatory Commission
NWPA	Nuclear Waste Policy Act
PMR(s)	Permit Modification Request(s)
RH	Remote-Handled
SBW	Sodium-Bearing Waste
TBI	Test Bed Initiative
TRU	Transuranic Waste
WIPP	Waste Isolation Pilot Plant
WIR	Waste Incidental to Reprocessing

ECA's mission is to bring together leadership from DOE-affected communities to share information, establish policy positions, and advocate for common interests in order to effectively address an increasingly complex set of environmental, regulatory, and economic development needs. ECA board members include local elected officials and community leaders from communities across the DOE complex.

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