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# Making Informed Decisions on DOE's Proposed High Level Waste Definition

A Guide for Communities and Recommendations for DOE

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# Making Informed Decisions on DOE's Proposed High-Level Waste Definition

## EXECUTIVE SUMMARY

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The U.S. Department of Energy (DOE) does not have an *available* high-level waste (HLW) repository. This lack of a disposal site has slowed the \$7 billion per year environmental cleanup program at DOE sites and turned several DOE sites across the United States into de facto high-level waste storage sites – a role they never agreed to nor expected. With environmental liability projections for DOE and its largest cleanup site growing, the current solution is not working.

DOE needs a disposition path for meaningful cleanup and protection of human health and the environment at these sites. We can no longer pretend that after 40 years and tens of billions of dollars spent that a high-level waste repository will be open in the next 10 years.

What the United States *does have* is capacity at commercial and government-owned sites that accept low-level waste (LLW) and transuranic waste (TRU) waste. With billions spent and new technology developed, additional disposal pathways have emerged to manage safely some existing waste currently intended for a HLW repository. DOE should evaluate the alternatives.<sup>1</sup> More directly, if some of that waste – based on its radiological characteristics – is not actually HLW but instead LLW or TRU waste – it should be able to be disposed of at existing disposal sites. This would allow cleanup to occur more efficiently and cost-effectively, moving more nuclear waste out of our communities and into safe and secure disposal facilities.

With this alternative in mind, in October 2018, DOE proposed<sup>2</sup> an interpretation of the definition of the statutory term “high-level radioactive waste” as set forth in the Atomic Energy Act of 1954<sup>3</sup> and the Nuclear Waste Policy Act of 1982<sup>4</sup> (collectively the “Nuclear Waste Laws”) that would allow waste previously managed as HLW to more properly be categorized according to its constituents rather than origin.<sup>5</sup> DOE believes this new interpretation could speed up cleanup at

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<sup>1</sup> ECA expects that any waste determined to be non- high-level radioactive waste via the new DOE interpretation will be classified as either LLW or TRU, and managed and disposed in accordance with its radiological characteristics. DOE is not proposing establishing a new waste category. TRU waste is disposed of at the Waste Isolation Pilot Plant (WIPP) and stored at the Waste Control Specialist (WCS) facility in Texas; LLW is disposed of at several DOE sites and the Nevada National Security Site.

<sup>2</sup> 83 FR 50909. See <https://www.federalregister.gov/documents/2018/10/10/2018-22002/request-for-public-comment-on-the-us-department-of-energy-interpretation-of-high-level-radioactive>

<sup>3</sup> 42 U.S.C. 2011 et seq. This definition of HLW was first enacted in the Nuclear Waste Policy Act of 1982, as amended, and incorporated into the AEA in 1988.

<sup>4</sup> 42 U.S.C. §10101 et seq. (1982).

<sup>5</sup> The basis for DOE's interpretation comes from the AEA and NWPA definition of HLW: (A) the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and

(B) other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation. See 83 FR 5909 (2018).

several sites (Idaho National Laboratory, Hanford, West Valley and the Savannah River Site); develop a path forward for waste stranded in interim storage and tanks; and save tens of billions of dollars. This new interpretation would allow DOE to address waste that is currently managed as “high-level” and determine its disposal pathway based on actual risk (“...disposed of in accordance with their radiological characteristics.”)<sup>6</sup>. The proposal is consistent with the risk-informed methodologies and policies used throughout the world, including those currently being developed by the U.S. Nuclear Regulatory Commission (NRC).

**ECA Recommendations**

ECA provides the following recommendations to DOE regarding its next steps as it moves forward with the potential new interpretation of HLW:

<b>ECA Recommendations to DOE</b>	
<ul style="list-style-type: none"> <li>• Provide a full evaluation of DOE’s proposed interpretation to define the specific waste that will be affected at each site.</li> <li>• Clearly identify each disposal pathway and what needs to occur at potential disposal sites for shipments to begin.</li> <li>• Identify the process and the timing of any new potential shipments.</li> <li>• Pursue active and transparent engagement of all affected communities and stakeholders.</li> <li>• Determine the realistic cost savings and revised timeline for cleanup.</li> <li>• Provide the States and local governments with resources to analyze the change and educate the communities.</li> <li>• Consider legislation to codify the proposed HLW definition to ensure consistency over time and maintain focus on cleanup versus litigation.</li> </ul>	<ul style="list-style-type: none"> <li>• Revise the DOE radioactive waste management policy and manual (DOE Order 435.1) to clarify that waste will be managed and dispositioned according to its characteristics, not its origin.</li> <li>• Work directly 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.</li> <li>• Consider legislation to amend the Land Withdrawal Act, which governs WIPP, to expand the volume of TRU waste (in particular Remote Handled TRU) to accommodate projected inventory and capacity.</li> <li>• Ensure communities can provide input into the Administration’s implementation of its “End States Contracting Strategy,” particularly in regard to DOE’s plans to implement any updated or revised approaches to waste management and disposal.</li> <li>• Continue to identify well-scoped pilot projects and waste management policy evaluations.</li> </ul>

<sup>6</sup> 83 FR 5909 (2018).

## Why Did ECA Create this Paper on DOE's Proposal?

ECA developed this paper to assist its members and their communities to understand DOE's proposed HLW interpretation proposal, and better engage with DOE on this highly technical alternative. In the absence of a full evaluation, with arguments being made both in favor of the clarification and in opposition, ECA's role is to provide local communities with information to make informed decisions, provide input to DOE and others, and to make recommendations on how to further meaningful discussion of proposed alternative waste management strategies

ECA understands that DOE's interpretation raises not only opportunity, but also significant and legitimate concerns. ECA has shared and will continue to develop answers to Frequently Asked Questions, as included in [Appendix B](#), to provide facts and facilitate discussion. In addition, ECA has been working with other non-profits, states, tribes and DOE to discuss the myriad issues, to understand any intended and unintended consequences and to identify missing information. While ECA's local government members are focused on the outcome, protection of human health and the environment remains the most important priority.

This technical interpretation carries a lot of political risks and complexities. There are concerns about how the interpretation will impact existing cleanup agreements at the sites among DOE, the Environmental Protection Agency (EPA) and the States and their legal authorities; whether LLW or TRU waste disposal facility would accept this waste; and whether the interpretation will lead to more or less waste onsite. Finally, while DOE's HLW interpretation is specific to reprocessing wastes, an extension of this risk-based approach to disposition other DOE waste streams can reasonably be anticipated. This would have far-reaching impacts to virtually every site across the EM complex.

While ECA is encouraged by the recent actions DOE-EM has taken to optimize progress in waste disposition – including the Hanford Tank Waste Test Bed Initiative, efforts to modify WIPP's Resource Conservation and Recovery Act (RCRA) permit, and this proposed interpretation of the HLW definition – important work and significant opportunity remain.

Therefore, ECA is asking for DOE to conduct and share a full evaluation of its proposed HLW interpretation, the potential benefits and the impacts to the nuclear weapons complex as a whole and at each site. ECA understands that after a framework for implementation is outlined, negotiations will begin with States and our communities.

# Making Informed Decisions on DOE’s Proposed High-Level Waste Definition

## INTRODUCTION

In September 2017, ECA published a report, *Waste Disposition: A New Approach to DOE’s Waste Management Must Be Pursued (September 2017)*<sup>7</sup>, to provide a range of recommendations on actions DOE should take to broadly risk-inform its waste management strategies. In contrast, this paper is focused exclusively on the single topic of DOE’s HLW interpretation and its potential impacts at DOE sites and communities.

***“Local communities, as DOE’s ultimate cleanup customer, want to see the sites cleaned up.”***

ECA supports DOE’s efforts to move forward and fully evaluate its proposed interpretation of the definition of the statutory term “high-level radioactive waste” (HLW) as set forth in the Atomic Energy Act of 1954 and the Nuclear Waste Policy Act of 1982. ECA communities, as DOE’s ultimate cleanup customer, want to see the sites cleaned up.

The current regulatory framework for DOE’s management of its radioactive waste streams is complex and difficult to understand. This is especially the case for those liquid and solid radioactive wastes generated by historic reprocessing of spent nuclear fuel (SNF), “reprocessing wastes,” the vast majority of which have historically been considered to be HLW. Additionally, specific technical and regulatory strategies for reprocessing differed among DOE’s HLW sites.

This publication has been developed to inform and facilitate energy communities’ and broader stakeholders’ engagement on this topic, as well as to provide clear and actionable recommendations to these communities and the DOE regarding any revised disposition decisions. ECA hopes to facilitate an open dialogue and engagement process that supports DOE’s actions to safely disposition its radioactive waste inventories in a manner that safely increases cleanup progress at its contaminated sites. Note that Section 3 outlines “The Solution”, including recommendations for a formal collaborative engagement process for DOE, states and communities. A specific proposal for this collaborative effort, “Path to Progress,” is outlined in Appendix A.

### HLW DISPOSAL: BACKGROUND AND STATUS

DOE does not have an *available* high-level waste repository in the United States, despite existing law<sup>8</sup> designating a repository at Yucca Mountain in Nevada in 1987. This lack of a disposal site has slowed the environmental cleanup at several sites and turned several DOE sites throughout the United States into de facto high-level waste storage sites. With environmental liability projections for DOE and its largest cleanup site growing, the current cleanup process is not working as planned.

<sup>7</sup> <http://www.energyca.org/publications>

<sup>8</sup> [Nuclear Waste Policy Act Amendments of 1987](#)

### *Growing Liabilities for DOE Cleanup*

In 1989, DOE created the Office of Environmental Management (EM) with a mission to complete the safe cleanup of the environmental legacy resulting from five decades of nuclear weapons development and government-sponsored nuclear energy research. After 30 years of progress, the DOE estimated lifecycle costs of the cleanup continue to grow – and significant challenges remain. DOE’s defense HLW continues to pose the greatest risk to human health and the environment. Currently, its only legal disposition path is a geologic repository for HLW that has been stalled for decades, and it is unlikely that an interim or permanent HLW disposal site will open to accept waste in the next decade.

Each year, DOE must estimate its environmental liability. In its FY 2018 liability estimate, the portion associated with EM liability grew to \$377B, a \$120 billion increase over the 2017 estimate. The costs to address radioactive tank waste comprised nearly half of the program’s 2017 estimate, and they comprise an even greater share of the updated 2018 estimate. DOE has identified that delays in the HLW repository also contribute to the increasing financial liability.

***“EM liability grew to \$377B, a \$120 billion increase over the 2017 estimate.”***

### *New Proposals Needed for Addressing Waste*

ECA’s September 2017 report recommended that DOE look at how waste is classified and 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.

Similarly, in the Fiscal Year 2018 National Defense Authorization Act (NDAA), Section 3139, Congress directed DOE to conduct an evaluation of the feasibility, costs and cost savings of classifying portions of defense nuclear waste as other than high-level radioactive waste, without decreasing environmental, health or public safety requirements.

DOE acted later in the year, publishing on October 10, 2018 a Federal Register Notice requesting public comment on its proposed interpretation of the statutory definition for high-level radioactive waste (HLW)<sup>9</sup>. The Summary stated, “The [DOE] provides this Notice and request for public comment on its interpretation of the definition of the statutory term ‘high-level radioactive waste’ (HLW) as set forth in the Atomic Energy Act of 1954 and the Nuclear Waste Policy Act of 1982. This statutory term indicates that not all wastes from the reprocessing of spent nuclear fuel (“reprocessing wastes”) are HLW, and DOE interprets the statutory term such that some reprocessing wastes may be classified as not HLW (non-HLW) and may be disposed of in accordance with their radiological characteristics. This interpretation will allow some waste currently managed as high-level waste to be more appropriately dispositioned as transuranic (TRU) or low-level waste (LLW).”

In order to build support, DOE’s proposed interpretation of HLW needs to be a technically-defensible alternative. DOE needs to demonstrate that it will enable safe progress toward final disposition of significant portions of stored waste inventories that, if unaddressed, present real environmental hazards to the communities as well as an ever-increasing burden on US taxpayers.

<sup>9</sup> 83 FR 5909. See, <https://www.govinfo.gov/content/pkg/FR-2018-10-10/pdf/FR-2018-10-10.pdf>

This interpretation is consistent with ECA’s 2017 recommendations and can be reviewed as responsive to Congress’ most recent direction under the 2018 NDAA. If done properly, any clarification will be consistent with the International Atomic Energy Agency’s (IAEA) activity-based waste classification scheme and safety standards, which call for the specific types and properties of waste to be taken into account when making disposal decisions.<sup>10</sup>

## OUTLINING THE ISSUES

This paper is organized into three sections:

1. **The Basics**: Provides a primer on the key elements of a risk-informed safety case for disposal facilities and provides a layman’s explanation of the regulatory framework for HLW disposition, DOE’s current practices, and its proposed interpretation of the statutory definition for HLW. This section attempts to distinguish between those “things we know” and those topics where DOE’s intentions are less clear where we offer ECA’s analysis to facilitate communities’ understanding and engagement.
2. **The Potential Impacts**: Discusses the proposed interpretation in the context of DOE’s current waste management policies and authorities related to reprocessing wastes. Additionally, this section outlines the potential impacts to DOE sites by identifying the waste streams most likely to be impacted by the interpretation and the disposal facilities most likely to be considered for disposition of waste streams addressed through the interpretation.
3. **The Solution - Next Steps**: Proposes next steps including a community and stakeholder engagement strategy (See the proposed “Path to Progress” outlined Appendix A) to support implementation. In addition, ECA outlines clear and actionable recommendations to promote increased progress toward cleanup across DOE’s nuclear weapons complex.

## 1. THE BASICS

### Key Elements of a Safety Case for Disposal

Understanding the key elements of DOE’s integrated approach to ensuring the safety of radioactive waste disposal may help explain DOE’s proposed HLW interpretation. DOE policy requires this integrated approach, using “defense-in-depth” principles to prevent and mitigate accidents that release radiation or hazardous materials. As explained by the Nuclear Regulatory Commission (NRC), “The key is creating multiple independent and redundant layers of defense to compensate for potential human and mechanical failures so that no single layer, no matter how robust, is exclusively relied upon. Defense in depth includes the use of access controls, physical barriers, redundant and diverse key safety functions, and emergency response measures.”<sup>11</sup>

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<sup>10</sup> It is notable that no other country with HLW streams is implementing its regulatory framework and policy based primarily on the origin of the HLW.

<sup>11</sup> [U.S. Nuclear Regulatory Commission Glossary](#)

**“Performance Assessments”** are one part of the integrated approach. Very simply put, performance assessments are detailed computer models that analyze the design features of the facility and the actual and anticipated waste inventories relative to applicable safety environmental regulations. Essentially, the model determines the “operational envelope for a disposal facility.” It also provides reasonable expectation that the facility will not exceed quantitative performance objectives<sup>12</sup> and is used to support decision-making for facility design, operations – including waste acceptance – and facility closure.

Providing defense-in-depth and increased confidence in DOE’s decision-making, DOE develops administrative and technical requirements specific to the disposal facility, including the **“waste acceptance criteria”** (WAC).

**“Special Analysis”** - The WAC define limits on radiological and chemical characteristics of acceptable wastes, as well as requirements related to its waste form, packaging, labeling, shipment, etc. Performance assessment and WAC work together within the integrated safety case for a disposal facility, but they are not the same. Under DOE’s performance-based policy as outlined in DOE Order 435.1 and the accompanying manual, a waste stream proposed for disposal at a specific facility may exceed the limits defined in the WAC. However, when evaluated against the facility’s performance assessment, it may be found to be acceptable because it can be safely disposed with reasonable expectation that the performance objectives, or protection limits, will be met at the time of closure. This is often referred to as a “special analysis.”

**“Risk Informed”**- Pursuant to its Atomic Energy Act authorities, DOE issues disposal authorization statements for each of its LLW disposal facilities. These statements are similar to the disposal licenses issued by the NRC and Agreement States to commercial LLW disposal facilities. The fundamental underpinning of this approach is the actual characteristics of the wastes. DOE evaluates the specific radiological, physical and chemical characteristics of wastes – not their origin – to analyze and determine treatment and disposal practices that are safe and compliant. DOE calls this a “risk informed” approach.

### **DOE’s Proposed Interpretation of HLW**

The legal definition for HLW is based on the Nuclear Waste Policy Act of 1982<sup>13</sup> and the Atomic

**Performance Assessment** is an analysis of a radioactive waste disposal facility conducted to demonstrate there is a reasonable expectation that performance objectives established for the long-term protection of the public and the environment will not be exceeded following closure of the facility

**Waste Acceptance Criteria (WAC).** Waste acceptance criteria are the technical and administrative requirements that a waste must meet in order for it to be accepted at a storage, treatment, or disposal facility.

– DOE Manual 435.1-1

<sup>12</sup> Performance objectives, in the case of disposal facilities, are the specific quantitative goals or limits defined to ensure protection of the public, environment, workers and inadvertent intruders, and to ensure the stability of the disposal system after facility closure.

<sup>13</sup> 42 U.S.C. 10101.



Energy Act of 1954.<sup>14</sup> These laws define HLW as:

- (A) The highly radioactive material resulting from the processing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and
- (B) Other highly radioactive material that the (Nuclear Regulatory) Commission, consistent with existing law, determines by rule requires permanent isolation.

DOE is now proposing to interpret that some reprocessing wastes may be classified as non-HLW and may be disposed based on their radiological characteristics, rather than their origin.<sup>15</sup> This is significant because, historically, DOE has conservatively managed most wastes resulting from reprocessing as HLW destined for a potential geologic disposal built as a federal HLW repository, based primarily on the waste's origin, using only the first paragraph of the definition. After decades of experience evaluating the *actual* radiological hazards posed by the wastes, the development of advanced waste forms, and site-specific performance-based disposal strategies, DOE appears poised to remove unneeded conservatism and define alternative disposition paths that are technically-defensible and implementable in the near term.

*DOE's proposed interpretation of HLW is that reprocessing waste is non-HLW if the waste:*

- i) Does not exceed concentrations for Class C LLW as set forth in section 61.55 of title 10, Code of Federal Regulations, or*
- ii) Does not require disposal in a deep geologic repository and meets the performance objectives of a disposal facility as demonstrated through a performance assessment conducted in accordance with applicable regulatory requirements.*

*Federal Register, Vo. 83, No 196, October 10, 2018*

This interpretation is not a significant deviation from DOE's existing performance-based policy for evaluating, selecting and operating its disposal sites, as defined within DOE Order 435.1, *Radioactive Waste Management* (although the language of the existing Order will likely need to be modified to incorporate a new interpretation). Nor does it change the existing technical basis for evaluating performance of waste streams within a disposal system to ensure that the defined performance objectives are met, and the disposal action is ultimately protective of human health and the environment.

The first criterion (i) of DOE's interpretation relies on existing commercial disposal practices and NRC regulations for land disposal of radioactive waste (10 CFR Part 61). The logic of DOE's position is simple: if a reprocessing waste can be demonstrated to be equivalent or less than

<sup>14</sup> 42 U.S.C. 2011 et seq.

<sup>15</sup> 83 FR 50909.

Class C LLW, it should be managed as or similar to LLW rather than HLW.

DOE's second criterion (ii) relies on the well-established technical basis and use of site-specific performance assessments to site and operate DOE LLW disposal facilities.<sup>16</sup> The logic of this position is simple: if a reprocessing waste can be demonstrated through complex modeling to be acceptable for compliant disposal in a land disposal facility, the waste does not require permanent isolation and therefore does not meet the intent of the HLW definition.

Because the criteria for classifying any reprocessing wastes as non-HLW relies on performance assessments and facility management processes that have been demonstrated to be protective and compliant for more than two decades, the implementation of the policy clarification does not decrease environmental, health or public safety requirements.

### **Following the International Model – IAEA**

DOE's proposed policy clarification has strong international precedent world-wide. Nearly all international waste classification determinations are based on the radiological characteristics of wastes. With few exceptions, the wastes resulting from SNF reprocessing are managed on actual characteristics, not origin. While specific techniques and disposal policies for these wastes streams may differ from country to country, most have adopted use of site-specific performance assessments – or integrated safety case methodology – for designing and operating disposal systems for their wastes. This is consistent with IAEA regulations and guides.

### **Applying a New Interpretation or Changing Waste Categorizations?**

DOE has not yet made it clear how the policy clarification will be incorporated within DOE Order 435.1. ECA expects that any waste determined to be non-HLW via the interpretation will be classified as either LLW or TRU and managed and disposed in accordance with its radiological characteristics.

In the chart below, the definition of the waste stream types is identified and HLW is highlighted since this is the definition that is the subject of DOE's interpretation.

<b>Waste Class</b>	<b>Summary</b>
<b>LLW</b>	Low-level radioactive waste is radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, byproduct material defined in section 11e.(2) of the Atomic Energy Act of 1954, as amended), or naturally occurring radioactive material. Adapted from: Nuclear Waste Policy Act of 1982, as amended.

<sup>16</sup> This approach is consistent with the NRC's proposed revisions to risk inform 10 CFR Part 61, including the use of site-specific performance assessments and waste acceptance criteria.

<b>TRU</b>	Transuranic waste is radioactive waste containing more than 100 nanocuries (3700 becquerels) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for: (1) high-level radioactive waste; (2) waste that the Secretary of Energy has determined, with the concurrence of the Administrator of the Environmental Protection Agency, does not need the degree of isolation required by the 40 CFR Part 191 disposal regulations; or (3) waste that the Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61. Source: WIPP Land Withdrawal Act of 1992, as amended.
<b>HLW</b>	High-level waste is the highly radioactive waste material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and other highly radioactive material that is determined, consistent with existing law, to require permanent isolation. Adapted from: Nuclear Waste Policy Act of 1982, as amended.

*DOE Manual 435.1-1 delineates three radioactive waste classes.*

It is important to note that DOE is not proposing to establish a new waste category.

### **Impact of HLW Interpretation on Waste Incidental to Reprocessing and 3116 Waste Determination**

It is useful to consider the relationship and impact of DOE’s policy clarification on HLW with other existing, reprocessing-related policies and requirements – namely “wastes incidental to reprocessing” (WIR) determinations and “waste determinations” made pursuant DOE Order 435.1 and Section 3116 of the National Defense Authorization Act, respectively. ECA does not believe that DOE is attempting to designate additional wastes as “incidental” to reprocessing. Rather, as explained above, DOE seems to be explicitly stating that some reprocessing wastes are not HLW because its radiological characteristics do not require geologic disposal.

**DOE 435.1 –Waste Incidental to Reprocessing Determinations (WIR)** allow for certain pieces of equipment and waste items that come in contact with reprocessing wastes to be determined to be WIR by citation – without processing or detailed analysis – enabling the timely classification and management of these items as either LLW or TRU, as appropriate. As described in the DOE 435.1 manual, these radioactive wastes are the result of reprocessing plant operations, for example contaminated job wastes including laboratory items such as clothing, tools, and equipment. These practices would not be impacted by the proposed HLW interpretation.

DOE 435.1 also allows for other equipment and items to be determined to be WIR through detailed evaluation. For example, a vitrification melter from West Valley was classified as LLW through a detailed evaluation process, which included regulator and public review, and disposed of at the Waste Control Specialists federal facility as Class C LLW. DOE’s use of WIR

determinations has historically been limited to wastes that are being treated and/or packaged for disposal at an on or off-site facility, rather than to support in-situ disposal decisions such as tank closures. This 435.1 WIR by evaluation process currently requires several criteria to be met, including the processing of the waste to remove key radionuclides to the maximum extent that is technically and economically practical.

It is unclear whether or how DOE intends to revise DOE Order 435.1 and its accompanying manual and guides to incorporate this proposed HLW interpretation and reconcile or modify the existing authorities.

**Waste Determination under Section 3116 of the NDAA is applicable only to Idaho and SRS** wastes, and its authorities have been used to support all of the final tank closures EM has achieved to date. Section 3116 is not applicable to Washington or other states. There are three criteria contained within this authorization, two of which are consistent with those in the 435.1 WIR evaluation process. Like the 435.1 WIR evaluation process, the 3116 waste determination process requires removal of key radionuclides to the maximum extent that is technically and economically practical as determined by the Secretary of Energy in consultation with the US NRC. It also requires formal consultation by the NRC and public comment, so there is an independent review of the disposal action (in these cases, tank closures) meeting the performance objectives defined within the 3116 determination process.

Importantly, the technical and regulatory basis of both DOE 435.1 WIR determinations and Section 3116 waste determinations provide strong precedent for DOE's proposed policy clarification. The criteria of all three decision types (WIR determination, 3116 waste determination and non-HLW classification) are similar with regard to waste concentrations and acceptability of land disposal approaches. However, there are two important differences: 1) removal of radionuclides and 2) consultation.

### **Removal of radionuclides to “the maximum extent practical”?**

While DOE 435.1 and Section 3116 require actions to remove radionuclides to the maximum extent practical<sup>17</sup>, DOE's proposed policy clarification does not require removal prior to the waste being classified. DOE asserts within its interpretation that this is an unnecessary and inefficient step for waste streams that already meet the existing legal and technical requirements for disposal.

It appears more likely that DOE's proposed interpretation is intended to address the bulk waste to be removed from tanks and its subsequent classification and treatment prior to disposal. For example, it may be feasible for DOE to limit the degree of pre-treatment required for some tank wastes before they are determined to be non-HLW and treated for disposal in a land disposal facility. The language also suggests that DOE views the WIR evaluation and determination, which requires processing to remove radionuclides, would not be necessary for future disposition

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<sup>17</sup> 3116 is premised on wastes that have radionuclides removed as being determined to be “not HLW”. 3116 does *not* constrain the evaluation of wastes where radionuclides are removed from being determined to be “not HLW”

projects such as the Test Bed Initiative for treatment and disposal of Hanford’s low activity waste (LAW). Rather than rely on a pre-treatment step to remove radionuclides to meet the first criteria of the statutory definition of HLW –which may not be required to reduce the risks of long term disposal – DOE intends to rely on characterization of the wastes and the disposal facilities performance assessments to demonstrate that, in some cases, the waste can be safely and compliantly dispositioned without that pre-treatment step.

This has been a noted concern. Comments provided to date by several parties – including the states of Washington, Oregon and NRC staff – indicate their expectation that DOE’s future actions to implement the revised HLW interpretation will be directly applied to future tank closure actions, including at sites like Hanford where Section 3116 is inapplicable. DOE’s position is that its “interpretation does not require the removal of key radionuclides to the maximum extent that is technically and economically practical before DOE can define waste as non HLW.” DOE has stated specifically it should not be read as clear intent to limit tank retrieval or cleaning efforts prior to tank closures as a means to lessen the protectiveness of any tank closure activity.

## 2. POTENTIAL IMPACTS

As it considers how to move forward with the proposed interpretation, DOE states in the Federal Register notice that it will “continue its current practice of managing all its reprocessing wastes as if they were HLW unless and until a specific waste is determined to be another category of waste based on detailed technical assessments of its characteristics and an evaluation of potential disposal pathways.” The analysis in the following sections is provided to facilitate understanding of *potential* actions that may be contemplated. As noted elsewhere, once DOE provides an evaluation of its proposal and framework for implementation, ECA will be better able to identify the actual impacts.

### Potential Impact to DOE Sites and Communities

If properly implemented, a shift to basing disposal decisions on actual radiological characteristics and risk to human health arising from the waste, rather than artificial former policy standards that base waste classification on origin, DOE can:

- Reduce years of DOE operations and risks at Hanford, INL, WV and SRS, benefiting the surrounding communities;
- Accelerate tank retrievals and closures at Hanford and SRS, which decreases risk to the workers and the environment;
- Accelerate the disposition of the treated tank waste forms, moving more waste out of the four sites quicker – thereby decreasing risk to the people who live in the communities;
- Decrease the number, size and duration of storage facilities pending availability of a permanent deep geologic HLW repository; and
- Save taxpayers tens of billions of dollars on EM Program’s remaining lifecycle costs.

As noted above, DOE’s proposed policy clarification is most directly relevant to sites that store HLW – i.e., those sites that historically processed spent nuclear fuel and now store large volumes of reprocessing waste currently classified as HLW. Under the proposed interpretation, a portion of this would be considered to be other than HLW (or “non-HLW”).

DOE’s HLW sites are Hanford, INL, Savannah River Site (SRS) and West Valley (WV). It can reasonably be interpreted that the primary waste streams to which the interpretation will apply are the vitrified canisters at SRS and West Valley, the sodium-bearing waste and calcine at Idaho, and a potentially significant portion of the tanks wastes at Hanford.

## **Hanford**

At the Hanford Site the policy clarification will enable simplification and acceleration of treatment and disposal plans for the low activity fraction of the tank waste inventory, because – once stabilized – a significant share of the tank waste volume will be LLW. The optimized plans can make use of existing technologies and facilities, allowing tank retrieval and treatment actions to begin sooner. Any progress toward acceleration and implementation of tank retrieval and waste stabilization will directly contribute to reductions in the environmental and worker risks of the deteriorating tank storage system. While there is potential to significantly reduce life-cycle scope and operations of the Waste Treatment Plant (WTP) system, it is premature to conclude that such decisions will be made. It is appropriate, however, to recognize that this policy clarification provides a near-term alternative to some of the capabilities planned within the WTP system. The alternative paths will begin to mitigate the cost, schedule and compliance impacts resulting from delays in WTP construction and commissioning. The extent of indefinite onsite storage for stabilized wastes will be reduced. The alternative plans will also provide needed redundancies that reduce future programmatic risk. It is notable that the implementation of parallel alternatives has yielded success at SRS.

In addition, the policy clarification is fundamentally consistent with the ongoing Hanford Low Activity Waste Test Bed Initiative (TBI)<sup>18</sup>.

The policy clarification, if applied broadly, could optimize the final disposition of other Hanford wastes streams, such as cesium and strontium capsules, K-basin sludges and some TRU streams.

## **INL**

For the Idaho Cleanup Project at INL, the proposed HLW interpretation will enable the final disposition of the sodium bearing waste. If applied broadly, it could also support evaluation of calcine disposition strategies and management of specific waste items generated by Idaho National Laboratory’s SNF examination, research and development activities. To the extent that the planned treatment of sodium bearing waste (steam reforming) proves to be un-

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<sup>18</sup> The TBI, a 2,000-gallon pilot effort, is demonstrating the feasibility of options for retrieval and treatment of the low activity portion of Hanford tank waste. Once treated, it contains the same constituents as low level radioactive waste (LLW) and is equivalent to LLW managed at Hanford, other DOE sites, and commercially-generated LLW regulated by the NRC. The TBI will use existing processes and commercial facilities to immobilize the treated Hanford tank waste in a solid form which will then be disposed of at Waste Control Specialists LLC (WCS) in Texas.

implementable due to continued challenges in the operations of the Integrated Waste Treatment Unit, this interpretation stands to enable evaluation and selection of optimized disposition alternatives.

### **Savannah River Site**

At SRS, there is potential for a portion of the existing inventory of vitrification canisters to be disposed in an existing off-site disposal facility, rather than being stored on-site indefinitely awaiting the availability of a future geologic repository. The policy clarification will also enable the accelerated and optimized completion of the remainder of the tank waste retrieval and disposition program. It is worth noting that the current SRS strategies for disposition of reprocessing wastes have largely been risk-informed to the extent possible within the limitation of DOE's current policy and historic HLW interpretation. However, this policy clarification can be used to build on the established precedent and make optimal use of the existing, approved site performance assessments and further optimize the program.

### **West Valley Demonstration Project**

At West Valley, notwithstanding the statutory complexities of site responsibilities being shared by DOE and New York, the proposed HLW interpretation could enable the disposition of the stored vitrification canisters there.

While DOE's proposed HLW interpretation is specific to reprocessing wastes, an extension of this risk-based approach to disposition of other DOE waste streams can reasonably be anticipated, which would have far-reaching impacts to virtually every site across the EM complex.

### **Impact to Disposal Facilities (other than WIPP)**

There is another category of sites potentially affected by the policy clarification – the potential disposal sites that could receive the treated waste streams covered by this interpretation

Given the two criteria laid out in DOE's proposed HLW interpretation on page 9, the disposal sites that DOE may consider utilizing for disposal of reprocessing wastes determined to not be HLW are those that have performance assessments demonstrating they can safely dispose of Class C low level wastes, or even wastes that exceed Class C concentrations. Based on DOE's past and current disposal practices as well as recent National Environmental Policy Act (NEPA) Analyses (including the Greater-Than-Class C (GTCC) LLW Disposal Environmental Impact Statement) and other current regulatory information, potential disposal facilities for reprocessing wastes include DOE's Nevada National Security Site (NNSS); Waste Control Specialists (WCS) Federal Waste Facility in Texas, a commercial facility<sup>19</sup>; and certain on-site DOE disposal facilities, such as the Integrated Disposal Facility (IDF) at Hanford; and disposal facilities at SRS including E-Area and Saltstone Disposal Facility.

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<sup>19</sup> While other commercial LLW disposal facilities can accept Class C LLW (Barnwell in SC and US Ecology in WA), they operate as Compact facilities (i.e., commercial facilities designated under the Low-Level Waste Policy Act to receive commercial wastes from specific states defined by legal compacts), and DOE does not currently dispose of DOE wastes at these sites.

## **Nevada National Security Site**

The performance assessment and WAC for NNSS already provide for the methodical evaluation of DOE waste streams based on the actual characteristics. Also, through a Memorandum of Understanding, DOE and Nevada collaborate on the review of waste profiles proposed for shipment to NNSS from other DOE sites.

The proposed HLW interpretation could result in changes to those off-site waste streams targeted for disposal at NNSS, but it is expected such changes would be addressed through the existing waste profiling collaboration process. The policy clarification does not affect the regulated disposition of waste streams requiring management as mixed waste under RCRA. Therefore, if waste streams impacted by the interpretation were subject to RCRA, they would only be acceptable at NNSS if they were approved for disposal in the mixed waste disposal cell, as permitted by Nevada.

## **Waste Control Specialists (WCS) Federal Waste Facility**

The WCS site is a highly engineered commercial facility for which a site-specific performance assessment has been developed and approved by the State of Texas. WCS' Federal Waste Disposal Facility opened in 2013 with the sole purpose of disposing of waste that is the responsibility of the federal government. In the past, DOE has disposed of waste streams that it has determined through detailed analysis to not be HLW under the current DOE 435.1 provisions, including solidified tank residues from the Separations Process Research Unit (SPRU) and the West Valley vitrification melter.

To provide a potential path for DOE to fulfill its regulatory responsibilities for GTCC LLW disposal, WCS has petitioned Texas to align its regulations in a manner that would provide a disposition pathway for GTCC LLW. Based on the petition, the NRC is proceeding forward with revising 10 CFR Part 61 to be consistent with the Low Level Waste Policy Amendments Act of 1985 and may develop disposal criteria for GTCC LLW as directed by the NRC Commissioners in 2015. Staff Requirements – SECY-0094-Historical and Current Issues Related to Disposal of Greater-Than-Class C Low-Level Radioactive Waste, published on December 22, 2015. Pending the outcome of this review and future license amendments, this facility could receive many of the DOE reprocessing waste streams determined to be non-HLW pursuant to the proposed clarification.

## **Hanford Integrated Disposal Facility (IDF)**

It is possible the proposed policy clarification could lead to changes in the operational plans for the IDF. Portions of the volumes of stabilized tank waste currently planned for disposal at IDF may be disposed elsewhere, reducing the total capacity required. Also, the waste acceptance criteria could be revised.

## **E-Area at SRS**

It is unlikely that DOE's proposed HLW interpretation will result in any significant volume or new waste streams targeted for disposal in E-Area, for several reasons. The facilities in E-Area have limited remaining disposal capacity and they are unable or unlikely to receive mixed wastes.



## Saltstone Disposal Facility

The disposal vaults within the Saltstone Disposal Facility currently accept the stabilized low-activity fraction of reprocessing wastes separated through pre-treatment processes. This separated stream has been analyzed and approved through the Section 3116 Waste Determination. The proposed HLW interpretation could impact the total volumes projected for vault disposal and potentially lead to a revision in the Saltstone waste acceptance criteria.

For those on-site facilities operated pursuant to DOE Order 435.1, the disposal authorization statements based on site-specific performance assessments govern what wastes can be safely accepted. Therefore, it is inappropriate to assume that any on-site DOE disposal facilities could accept reprocessing wastes subject to this interpretation. Disposal facilities at DOE HLW sites that were developed under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) authorities are unlikely to be considered for disposal of reprocessing wastes, eliminating Hanford's Environmental Restoration Disposal Facility (ERDF) and Idaho's CERCLA Disposal Facility (ICDF).

## Impact to the Waste Isolation Pilot Plant (WIPP)

Per law (WIPP Land Withdrawal Act<sup>20</sup> and DOE policy), WIPP only accepts TRU wastes generated from U.S. atomic energy defense activities,<sup>21</sup> and the TRU waste definition is entirely based on radiological characteristics of the waste. The potential impacts to WIPP are particularly difficult to describe and evaluate due to three complicating factors: 1) overlapping and/or conflicting waste category definitions; 2) the specifics of DOE's HLW interpretation as published in the Federal Register; 3) WIPP RCRA permit conditions.

Under a solely origin-based definition of HLW, some DOE waste streams could be simultaneously classified as both TRU waste and HLW. Yet, disposal of HLW at WIPP is prohibited by law as negotiated in the WIPP Land Withdrawal Act<sup>22</sup>. This regulatory overlap results in programmatic and technical inconsistencies. DOE has been unable to disposition select waste streams that meet the statutory definition of TRU waste and whose final waste form is designed to meet the WIPP WAC, without first determining that the waste is not HLW.

DOE may determine some waste volumes historically managed as HLW due to their origin are non-HLW. If the waste stream – especially in its treated form – meets the definition of TRU, it could be eligible for disposal at WIPP. Such waste streams include, but are not limited to, Idaho's sodium bearing waste, some Hanford tank wastes, and potentially some vitrified canisters at SRS and West Valley.

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<sup>20</sup> The Waste Isolation Pilot Plant Land Withdrawal Act, Public Law 102-579, as amended by Public Law 104-201 (H.R. 3230, 104th Congress)

<sup>21</sup> Transuranic Waste is waste containing more than 100 nanocuries of alpha-emitting TRU isotopes per gram of waste, with half-lives greater than 20 years, except for: (A) high-level radioactive waste; (B) waste that the Secretary has determined, with the concurrence of the Administrator, 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 Title 10, Code of Federal Regulations.

<sup>22</sup> See: [Public Law 102-579 The Waste Isolation Pilot Plant Land Withdrawal Act](#)

The disposition of any wastes via this policy clarification should not be viewed as an expansion of WIPP's mission. In fact, a portion of the waste streams potentially addressed through this policy clarification have previously been analyzed for disposal at WIPP and included in DOE's Annual Transuranic Waste Inventory Report as "potential TRU waste."

It is not apparent that DOE intends for its proposed HLW interpretation to enable reprocessing wastes to be disposed at WIPP. It states waste resulting from the reprocessing of SNF is non-HLW if the waste either i) does not exceed Class C LLW concentration limits or ii) does not require disposal in a deep geologic repository and meets the performance objectives of a disposal facility as demonstrated through a performance assessment conducted in accordance with applicable regulatory requirements. It is reasonable to conclude that neither of these criteria are applicable to TRU waste and WIPP, because wastes meeting the definition of TRU contain concentrations of radioactivity in excess of the limits established for Class C LLW, and WIPP is a geologic repository.

Therefore, it is possible that reprocessing wastes evaluated under this proposed policy clarification may meet the definition of TRU waste and may be suitable for disposal in a facility other than WIPP, by virtue of the second criteria in DOE's proposal. While this may seem controversial to some stakeholders, it should not be interpreted as an implied intent by DOE to reduce WIPP's mission. DOE Order 435.1 currently allows for disposal of TRU waste in a facility other than WIPP provided that facility meets the performance objectives of 40 CFR 191. Further, as the NRC risk informs its regulations for land disposal (10 CFR Part 61) to rely on site-specific performance assessments, engineered disposal facilities such as Waste Controls Specialists will likely be able to demonstrate acceptable and protective disposal of GTCC LLW and TRU waste.

The "mission need" for WIPP's continued operation is not in question. Given the extensive remaining legacy environmental cleanup scope and newly generated wastes resulting from other DOE and NNSA missions, it is critical that there be multiple alternatives for final disposal. Such complexity requires continued coordination with stakeholders throughout the complex to address foreseeable misunderstandings and community concerns.

Irrespective of DOE's proposed policy clarification and any resulting disposition decisions, to the extent that DOE intends to disposition any reprocessing wastes at WIPP, a modification to WIPP's Hazardous Waste Facility Permit will be required. The WIPP permit currently contains provisions that exclude or prohibit certain wastes from disposal, including "waste that has ever been managed as high-level waste and waste from tanks specified in Table C-4, unless specifically approved through a Class 3 permit modification." This provision, which is often referred to as the "tank waste exclusion," requires modification for some of the wastes covered by the DOE's proposed policy clarification to be eligible for disposal at WIPP. ECA addressed the need for this permit modification in its 2017 Waste Disposition paper, recommending that DOE continue to engage the State of New Mexico on a holistic regulatory strategy to enable the optimized use of WIPP's invaluable geologic disposal capacity.<sup>23</sup> This recommendation remains valid.

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<sup>23</sup> In December 2019, the New Mexico Environment Department approved an alteration to how the volume of waste emplaced in WIPP is tracked, allowing WIPP to be more optimally utilized.

## Potential Impact to Existing Regulatory Requirements

One aspect that is garnering much attention from the states and communities where DOE stores HLW is implementation – an issue DOE has yet to address. Currently there are numerous requirements at HLW sites related to treatment technologies, remaining tank residuals, disposal, and associated schedules laid out in laws, regulations, permits, orders, agreements, etc. (collectively “regulatory requirements”). The question is: what happens to these regulatory requirements when DOE decides HLW is non-HLW? Further, what information is needed by state regulators and local communities to consider amending existing agreements to address this issue?

It is unclear whether DOE will determine that HLW currently subject to a regulatory requirement will stay subject to that requirement after implementing the new interpretation. If DOE determines a portion of the waste is non-HLW, the previously applicable regulatory requirement may be nullified. Some are concerned that DOE could make this decision unilaterally, based on the new interpretation, without regulatory and community review or public input. However, DOE states in the Federal Register notice that, “At this time, DOE is not making – and has not made – any decisions on the disposal of any particular waste stream. Disposal decisions, when made, will be based on the consideration of public comments in response to this Notice and prior input and consultation with appropriate state and local regulators and stakeholders.” The details of this consultation and implementation phase are not clear, and ECA calls on DOE to indicate when and how such consultation will take place.

The table below contains major regulatory requirements related to the HLW sites that would potentially be impacted as part of the new interpretation implementation. This list is not exhaustive -- other state-specific statutes apply but are not major drivers in the regulatory basis of this interpretation.

HLW Site	Regulatory Requirement
Hanford	1997 NRC Provisional Waste Incidental to Reprocessing, Hanford Federal Facility Compliance Order, 2010 Consent Decree, RCRA Dangerous Waste Permit
INL	1995 Settlement Agreement, Site Treatment Plan
SRS	Site Treatment Plan, Saltstone Disposal Facility Permit, 2016 Dispute Resolution Agreement
West Valley	2002 NRC Policy Statement on Decommissioning Criteria for the West Valley Demonstration Project

As noted before, the statutory basis of Section 3116 is enduring. As law, Section 3116 likely trumps policy clarification or interpretation. While Section 3116 provides a way for DOE to declare some waste as non-HLW, it is not effective until the covered state, Idaho or South Carolina (the only currently authorized states), also authorizes the non-HLW under a closure plan or permit if the disposition action occurs within the state. The state decision point is a way to ensure regulatory and community input prior to a change. While the interpretation could impact details of DOE’s disposition strategies at Savannah River and Idaho, the requirements of 3116 remain in force.

Similarly, DOE's interpretation of HLW cannot impact the legal requirements of Resource Conservation and Recovery Act (RCRA). Since much of the reprocessing waste is mixed waste with a hazardous component regulated by RCRA, disposal of the non-HLW must still comply with RCRA. This means the disposal facility should have a RCRA permit or potentially a state solid waste permit (for de-characterized mixed waste). The permit requirement is another venue for a defined state and community voice. This is especially relevant at Hanford, where the existing compliance orders and tank closure requirements are RCRA-based.

Open discussions between DOE, regulators, local governments, and other stakeholders about potential implementation and feasibility of amending existing legal agreements will be critical.

### 3. THE SOLUTION - NEXT STEPS

**This policy clarification is needed now to effectively, efficiently and sustainably facilitate cleanup.**

ECA believes there is a strong technical basis for the interpretation that DOE is now making, as demonstrated by international waste management practices and IAEA guidance<sup>24</sup>. Equally important, the EM Program is at a crossroads of sorts, and now is the time for alignment around a consistent risk-informed strategy that will deliver significantly improved progress toward compliance and project milestones. The latest GAO report, Program-Wide Strategy and Better Reporting Needed to Address Growing Environmental Cleanup Liability (GAO-19-28), as well as DOE's latest annual report on the Hanford lifecycle<sup>25</sup>, illustrate the need for revised approaches.

The current Administration is implementing its "End States Contracting Strategy", which is a process to have new competitively awarded cleanup contracts at nearly every major EM site or project over the next two years. It is critical that these acquisition events be fully informed by community input and DOE's risk-informed plans, so the contracts awarded can seamlessly implement the updated approaches. If they are not, the time and expense of modifying the contracts may impede progress.

As DOE demonstrated with the Accelerated Site Closure Pilot projects (Rocky Flats, Mound and Fernald), extraordinary cleanup successes are achievable when the regulatory strategies are fully aligned within performance-based contracts. Expressed another way, leveraging the acquisition cycle has proven to be one of the most effective ways to implement policy initiatives.

Finally, there are enabling factors that may not be available indefinitely. There are currently two host communities that are supportive of radioactive waste disposal (Carlsbad, NM, and Andrews, TX), and there are available commercial treatment and disposal resources available to complement DOE capabilities, allowing for optimization. If DOE fails to leverage these resources, their availability or interest may diminish over time as they look for alternative missions.

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<sup>24</sup> [https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1419\\_web.pdf](https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1419_web.pdf)

<sup>25</sup> 2019 Hanford Lifecycle Scope, Schedule and Cost Report, DOE/RL-2018-45, Revision 0, published January 2019.

Careful implementation of this performance-based approach to disposition planning will enable significant near-term progress at these DOE sites, overcoming barriers such as the decades-long delay in availability of the federal repository. Performance-based disposal strategies will enable acceleration over current cleanup baselines and enable the “end states” vision that EM is pursuing in its current solicitations.

### **A Federal HLW Repository Is Still Needed**

DOE’s proposed Interpretation of HLW does not negate the need for a permanent geologic repository. Regardless of how DOE proceeds, there will still be inventories of DOE-owned or managed HLW – as well as significant inventories of spent nuclear fuel -- requiring permanent disposal in a deep geologic repository. ECA supports moving ahead with the Yucca Mountain licensing process. There will be many lessons learned for DOE, for the Nuclear Regulatory Commission, for the Environmental Protection Agency, and for stakeholders that can inform the siting of another high-level waste repository.

### **Establish a Formal and Transparent Process to Support Implementation of Alternative Waste Management Strategies**

As this paper has detailed, the implications of DOE’s proposed clarification to current policy and plans stand to be very complex. In the past, DOE has successfully made it through complex and controversial processes by directly engaging the states and local communities in both national and site-specific dialogues. DOE has failed when it did not meaningfully include key parties in the meetings.

ECA encourages DOE to undertake a proactive and collective process. ECA encourages DOE to continue communicating to stakeholders and that a formal consultative process will be established to inform policy revisions and implementation.

Two good models to consider are the collaborative processes employed in the mid-1990s with EPA, states, local and tribal governments to develop Federal Facility Agreements, and DOE’s annual meetings with its intergovernmental groups. With the backdrop of the unprecedented increases in DOE’s environmental liability estimate and continued delays in the construction and commissioning of major treatment and disposal facilities required to complete cleanup, it is time to use these successful models for engagement that assists DOE and the communities to accomplish their cleanup goals. ECA supports a well-coordinated and inclusive process at both a national and site level.

ECA recommends DOE proactively caucus with the states and communities with significant cleanup scope remaining, especially those with inter-site dependencies. The goal of the engagement should be discussion of DOE’s revised, risk-informed waste disposition strategies; discussion of any policy or compliance changes needed to implement the strategy; and development of a new national plan that incorporates appropriate risk reduction priorities, rationalizes milestones and objectives associated with pre-existing agreements, and incorporates current budget projections and realities into scope and schedule. The “Path to Progress” in

Appendix A details one such approach.

## **DOE and Congress Should Consider Whether Legislation is Needed**

Despite the technical basis behind DOE's proposed HLW clarification, key stakeholder groups have identified plans to challenge this proposal, potentially through litigation. Legislation that codifies DOE's interpretation could mitigate the risk of litigation, expedite resolution of any legal challenges, and institutionalize this approach so it is less vulnerable to change. However, legislation has its own process that may not lead to the desired solution and a robust, collaborative process will be required to determine the correct legislative language. Discussion of legislation could and should proceed in a parallel with DOE's policy plans.

DOE and Congress should consider whether legislation can address the issues related to clarifying 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: "(A) the highly radioactive materials [...] that contains fission products in sufficient concentrations."

## **ECA Recommendations to DOE**

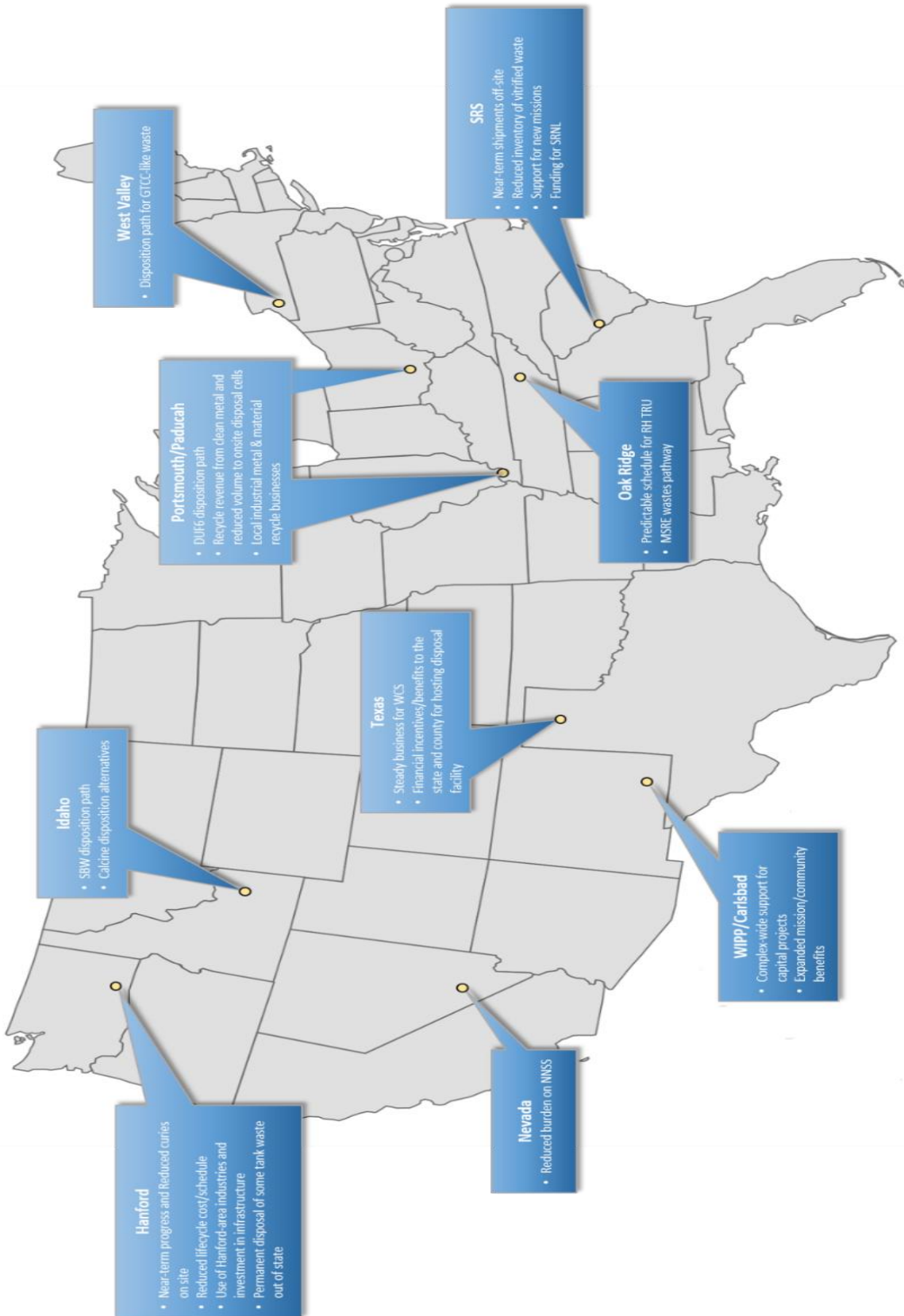
ECA considers DOE's Federal Register Notice and request for public input to be an important initial step in pursuit of these objectives, especially in light of aging infrastructure, budget limitations and, at times, a lack of trust between regulators and DOE across DOE's weapon complex. In support of moving forward, ECA recommends that DOE:

- **Provide a full evaluation to demonstrate the specific waste that will be affected at each site.** DOE needs to identify specific plans for projects at each site potentially impacted by this new interpretation. DOE's proposal must be sound, technically defensible and protective of the environment and public health. DOE should complete and release an evaluation of the feasibility, costs, and cost savings of classifying covered defense nuclear waste as other than HLW, such as outlined in Section 3139 of the National Defense Authorization Act for Fiscal Year 2018.
- **Clearly identify each disposal pathway and what needs to occur at each potential disposal sites for shipments to begin.** For example, while some waste will be shipped off-site based on the new interpretation, how much additional waste might now be disposed of on-site (if any)?
- **Identify the process and the timing of any new potential shipments,** as well as where this waste would fall in the queue for disposal at existing facilities.
- **Engage Communities.** DOE must pursue active and transparent engagement of all affected communities and stakeholders, and provide a full evaluation of the feasibility, cost, cost savings, and potential site-by-site impacts. Given the complexity of the regulatory and technical issues—and the real cleanup progress and risk-reduction that could be achieved—this engagement must go beyond general information-sharing. ECA believes a

formal, multi-site engagement initiative must be put in place to build true partnership and a real path to implementation.

- **Identify the realistic cost savings and revised timeline for cleanup.** Large savings numbers and accelerated schedules are anticipated by supporters of DOE's proposed interpretation, but no underlying supporting information has been released.
- **Provide the States and local governments with resources to analyze the change and educate the communities.** If a state will be accepting waste from around the country, it needs the resources to analyze the data, educate their community and understand the impact. Some states require permit modifications. DOE must provide the resources to assist them to implement the process.
- **Consider legislation to codify the proposed HLW definition to not only save time, but maintain focus on cleanup versus litigation.** Legislation that codifies DOE's interpretation can mitigate the risk of litigation, expedite resolution of any legal challenges, and institutionalize this approach so it is less vulnerable to change.
- **Revise the radioactive waste management policy and manual (DOE Order 435.1)** to clarify that waste will be managed and dispositioned according to its characteristics, not its origin. This will allow some wastes previously managed as HLW to more appropriately be treated as TRU and LLW in accordance with its composition, making alternative, nearer-term disposal paths available provided waste meets applicable requirements (performance assessment and waste acceptance criteria) of existing disposal facilities. This will also resolve potential confusion and conflict between this basic waste classification process and the existing policy and legal authorities related to reprocessing.
- **Work directly 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.** Work with Congress to amend the Land Withdrawal Act, which governs WIPP, to expand the volume of TRU waste (in particular Remote Handled TRU) to accommodate projected inventory and capacity.
- **Consider legislation to amend the Land Withdrawal Act, which governs WIPP, to expand the volume of TRU waste (in particular Remote Handled TRU) to accommodate projected inventory and capacity.**
- **Ensure communities can provide input into the Administration's implementation of "End States Contracting Strategy,"** particularly in regard to DOE's plans to implement any updated or revised approaches to waste management and disposal.
- **Continue to identify well scoped pilot projects and waste management policy evaluations** to better understand alternative approaches and inform future policy decisions. These projects include demonstrating feasibility of treatment and off-site disposal of Hanford low-activity tank waste and documenting the technical basis for certain treated tank wastes from Savannah River and Idaho to be designated as transuranic waste (TRU) and dispositioned at WIPP or commercial facilities.

## Potential Benefits for Each Site and Community





Today, the high-level waste clarification put forward by DOE exists only as a compelling concept. The technical basis and underlying principles appear to be sound and generally protective of workers, the public at large and the communities that host DOE sites. However, in order to move successfully into the implementation phase and realize benefits of the proposed change, DOE needs to invest in an engagement process that can truly create consensus for any alternatives and a new national plan.

The stakes have never been higher. Despite significant progress over the last three decades, the costs of the DOE cleanup program are increasing by billions of dollars each year and it is clear that the current approach is not delivering the ultimate risk reduction, mission completion and environmental restoration that host communities expect.

Absent a substantial turnaround, ECA fears that support for the program will begin to erode among key stakeholders, putting annual funding in jeopardy and further delaying the successful cleanup of these sites. The proposed HLW interpretation, coupled with DOE's new focus on end-states contracting strategies, presents an opportunity for a much-needed sea change in addressing the highest risk and highest cost waste in the DOE cleanup program—we must not squander this opportunity. ECA stands ready to engage proactively with DOE and other stakeholders as this process moves forward.

## **Appendix A**

### **The Path to Progress**

ECA proposes to co-host the Path to Progress with one or more state organizations (for example, ECA and ECOS have hosted multiple joint meetings on the HLW Interpretation), a series of four or more national level meetings gathering policymakers from host states, concurrently with host community forums. The Path to Progress will spur open, collaborative dialogue to set the stage for safe and acceptable waste end states. Updates on the Path to Progress will be available on the ECA website. This effort is intended to continue educating stakeholders and to provide a framework within which DOE can engage states on waste-stream by waste-stream impacts while maintaining a holistic strategy that is understood and aligned with consistent, risk-informed principles. The Path to Progress would take the following direction and order:

#### ***1. Policymaker's Roundtable – Kickoff Meeting***

Similar to ECA and ECOS's May 1, 2019 meeting, the Policymaker's Roundtable would consist of representatives from the Governor's office, Attorney General, state environmental agency and local government and tribal representatives for each of the potentially affected states: Idaho, Nevada, New Mexico, New York, South Carolina, Texas, and Washington, as well as representatives from DOE and EPA. Representatives could be chosen with assistance from the National Governors Association, National Association of Attorneys General, the Environmental Council of the States, State and Tribal Working Group and ECA. Given the current lack of movement, these representatives would meet to explore potential resolution paths, benefits of working together on HLW disposition, and a plan for moving forward. Inherent to participation would be the foundation that each representative would be acting to benefit their state in a mutually collaborative process. The goal of this meeting would be to establish a commitment to future participation, open communication and collaboration, and a plan of action for potential resolutions.

#### ***2. Community Forums in Washington, South Carolina, Idaho, New York, Nevada, New Mexico, and Texas***

DOE could host Community Forums in each of the affected communities after the initial Policymakers Kickoff to identify most important state, community and Tribal Nation issues related to HLW. The Forums would include site specific baseline information about current HLW conditions, potential opportunities, and challenges. The Forums would also outline proposed steps in the Path to Progress and the role of the community and Tribal Nations in the process. The most important product of the Forums would be identification and understanding of community and Tribal Nation priority issues for HLW and inclusion of those issues in the Path to Progress dialogue. Community participants would be able to continue to provide input through an on-line portal HLW page.

#### ***3. Policymaker's Roundtable – Baseline Information Meeting***

The second meeting of the Policymaker's Roundtable would be to establish baseline information and form a common understanding of the HLW and disposal landscape: the HLW volumes, characteristics, and forms; the disposal site capacities and capabilities; the current regulatory and legal aspects; the bounding timeframes and budgets; and associated risks. During

this meeting the policymakers would also be briefed on initial priority issues gathered from the Community Forums and identify any areas of analysis needed in preparation for identification of potential resolution possibilities. At this stage it will also be important for policymakers to begin raising state equity considerations, that is, any ancillary or related issue that would make certain HLW strategies more or less palatable for that state. Recognition of equity considerations was essential to success of the early 1990s Site Treatment Plan process and remains a vital factor in reaching resolution for all parties on HLW issues.

#### **4. *Policymaker's Roundtable – Possibilities***

During this meeting, policymakers identify potential possibilities with no expectation of commitment to any decision at this point. The participants should be open to a full range of possibility discussion, along with exploration of strengths and weaknesses, unburdened by commitment to follow on actions at this stage. The discussion of possibilities will also be informed by the influence of equity considerations and community priorities. The outcome from this meeting would be potential HLW pathways with associated strengths, weaknesses, equities, and community concerns. The delineated potential outcomes may pertain to the entire group or to various combinations of the parties. The outcome would not reflect any policymaker decisions on HLW pathways or policymaker decisions to amend existing agreements.

#### **5. *Policymaker's Roundtable – Path to Progress***

Policymakers will be in a position at this meeting to determine whether to ally efforts toward one or more resolution possibilities. It is important to note that this may be as a whole or any combination of the parties that have participated. If the representatives support one or more resolutions, the policymakers may identify actions needed, barriers to the pathway, along with strategies and action plans to overcome challenges and move the proposed resolution forward. Equity considerations are anticipated to be a part of this important path forward discussion. The outcome from this meeting would be action plans for any consensus (group or sub-group) supported Path to Progress with supporting implementation strategies. Any proposed changes to regulatory requirements will likely have an inherent, associated public involvement process. Optimally, the action plans would support timely HLW disposition to safe, risk-informed end states while reducing taxpayer burden.

To the extent that DOE's revised waste disposition strategies require updated environmental analyses, it is strongly recommended that DOE begin at the national, programmatic level. This will not only facilitate integration and alignment of site-specific NEPA review and decisions, but it will hopefully minimize the vulnerabilities of concurrent or competing legal challenges.

Great benefits will result from this effort, including properly aligned risk reduction and completion expectations with states and stakeholders, budget and funding profiles that meet these expectations, and a foundation for the types of regulatory optimizations contemplated in EM's End State Contracting Strategy. There is little doubt it would re-vitalize the EM program to once again be capable of accomplishing milestones, accelerating risk reduction and closing sites.

## **Appendix B**

### **FAQs on DOE's Interpretation of High-Level Radioactive Waste**

On Oct. 10, 2018, the Department of Energy (DOE) Environmental Management (EM) Program published a request for public comment on their interpretation of the statutory definition for high-level radioactive waste (HLW) [FR Vol 83, No 196]. ECA developed this Questions and Answers to help educate stakeholders on the potential impact.

#### ***What is the current definition of HLW and why would DOE “interpret” the HLW definition?***

The statutory definition for HLW is based on the Nuclear Waste Policy Act of 1982 and the Atomic Energy Act of 1954. These laws define HLW as:

- (A) The highly radioactive material resulting from the processing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and
- (B) Other highly radioactive material that the (Nuclear Regulatory) Commission, consistent with existing law, determines by rule requires permanent isolation.

DOE is interpreting that some reprocessing wastes may be classified as non-HLW and may be disposed based on their radiological characteristics, rather than their origin. This is significant because, historically, DOE has conservatively managed most wastes resulting from reprocessing as HLW destined for geologic disposal in the federal HLW repository, based solely on their origin, using only the first paragraph of the definition. After decades of experience evaluating the *actual* radiological hazards posed by the wastes and the development of advanced waste forms and site-specific performance-based disposal strategies, DOE appears poised to remove the unneeded conservatism and define disposition paths that are technically defensible and implementable in the near term.

This interpretation of the statutory HLW definition is very consistent with the recommendations ECA made last year in its publication *Waste Disposition: A New Approach to DOE's Waste Management Must Be Pursued* (September 2017). It is also consistent with the IAEA's activity-based waste classification scheme and safety standards that call for the specific types and properties of wastes to be taken into account when making disposal decisions.

#### ***How is this different from “Waste Incidental to Reprocessing” and “Tank Waste Determinations”?***

DOE's interpretation is distinct from the “wastes incidental to reprocessing” and “tank waste determinations” made pursuant to authorities within DOE Order

435.1 and Section 3116 of the National Defense Authorization Act, respectively. DOE is not attempting to designate additional wastes as “incidental” to reprocessing. Rather, they are explicitly stating that some reprocessing wastes are not HLW because their radiological characteristics do not require geologic disposal. Specifically, their interpretation is that if reprocessing wastes do not exceed the statutory definition for Class C low level waste (LLW) in 10 CFR Part 61 or if reprocessing wastes meet the performance objectives of a disposal facility that is not a deep geologic repository as demonstrated by a regulatorily-approved performance assessment, then the reprocessing wastes are not HLW and do not require geologic disposal.

It is also important to note that DOE has not made and is not making any revised decisions on waste streams disposal via this Federal Register notice.

### ***How will DOE’s interpretation impact disposition plans in the future?***

This interpretation of the HLW definition is directly relevant to the DOE HLW sites – Hanford, Idaho, Savannah River Site (SRS) and West Valley (WV) – and the potential receiver sites. Based on the potential cost savings that can be used to accelerate cleanup at all sites, all sites should pay attention to the potential interpretation of the HLW definition.

ECA can reasonably interpret that the waste streams to which this interpretation may apply are the vitrified canisters at SRS and WV, the sodium-bearing waste and calcine at Idaho and some Hanford tank wastes. Notably, an extension of this risk-based approach to disposition of other DOE waste streams can reasonably be anticipated, which would have far-reaching impacts to virtually every site across the EM complex.

The disposal sites that DOE may consider utilizing for disposal of reprocessing wastes determined to not be HLW are those that have performance assessments demonstrating they can safely dispose of Class C LLW or even wastes that exceed Class C concentrations. Based on DOE’s prior analysis (the Greater Than Class C LLW Disposal Environmental Impact Statement) and other current regulatory information, these disposal facilities include the Waste Isolation Pilot Plant, Waste Control Specialists facilities in Texas, DOE’s Nevada National Security Site (NNSS) and certain on-site DOE disposal facilities, such as the Integrated Disposal Facility (IDF) at Hanford. While other commercial LLW disposal facilities can accept Class C LLW (Barnwell in SC and US Ecology in WA), they operate as Compact facilities (i.e., commercial facilities designated under the Low Level Waste Policy Act to receive commercial wastes from specific states defined by legal compacts), and DOE does not currently dispose of DOE wastes at these sites. Also, all DOE on-site disposal facilities operate under disposal authorization statements (similar to disposal licenses) that are based on site-specific performance assessments. Therefore, it is inappropriate to assume that all on-site DOE disposal

facilities could accept reprocessing wastes subject to this interpretation.

***Why is DOE doing this now?***

As ECA identified in its White Paper, there is a strong technical basis for the interpretation that DOE is now making. Careful implementation of this performance-based approach to disposition planning will enable significant near-term progress at these DOE sites, overcoming barriers such as the decades-long delay in availability of the federal repository. Performance-based disposal strategies will enable acceleration over current cleanup baselines and enable the “end states” vision that EM is pursuing in its current solicitations.

ECA still expects that billions of dollars can be saved in avoided storage facilities and operations if waste disposition decisions are risk-based to the maximum degree possible, and these savings from current baseline costs can be reinvested to the advantage of the sites and surrounding communities around the Country.

***What are the next steps and potential timeline?***

At the time of writing, DOE is still reviewing comments received in response to its Federal Register Notice on its proposed interpretation of the statutory definition for high-level radioactive waste (HLW). After considering the input, it will be necessary for DOE to develop and issue guidance to its sites on how this interpretation is to be implemented relative to the existing DOE Order for Radioactive Waste Management (DOE Order 435.1).

It is likely that any revisions to current waste stream disposition strategies will require new or additional review under the National Environmental Policy Act. Thus, any revised disposal decisions are also likely to involve additional public review and will not occur until late in 2019, at the earliest.





**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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