UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION

In the Matter of:	§	
	§	**Docket No. 50-614-CP**
Long Mott Energy, LLC	§	
	§	**August 11, 2025**
(Long Mott Generating Station)	§	
	§	

SAN ANTONIO BAY ESTUARINE WATERKEEPER'S
PETITION TO INTERVENE AND REQUEST FOR HEARING

NOW COMES San Antonio Bay Estuarine Waterkeeper ("Waterkeeper" or "Petitioner"), by and through counsel, and submits this Petition to Intervene and Request for Hearing in the above-captioned proceeding.

I. INTRODUCTION

Pursuant to 10 C.F.R. § 2.309, and the hearing notice published at 90 Fed. Reg. 24428 (June 10, 2025), Petitioner San Antonio Bay Estuarine Waterkeeper ("Waterkeeper" or "Petitioner"), hereby requests the U.S. Nuclear Regulatory Commission ("NRC" or "Commission") to grant a hearing and leave for petition to intervene regarding Long Mott Energy, LLC ("LME")'s Construction Permit Application for the proposed Long Mott Generating Station.[1] LME submitted the Long Mott Construction Permit Application ("LM-CPA") to the NRC on March 31, 2025. The NRC released the LM-CPA to the public on April 16, 2025, and it accepted the LM-CPA for review on May 12, 2025. It published

[1] Long Mott Energy, LLC, Submittal of Construction Permit Application for Long Mott Generating Station, April 16, 2025, https://www.nrc.gov/docs/ML2509/ML25090A057.html.

a Federal Register notice of opportunity to request a hearing and petition for leave to intervene on June 10, 2025.

The proposed facility would be located in Seadrift, Texas, adjacent to Seadrift Operations ("SDO"), which is owned and operated by Union Carbide Corporation, a subsidiary of the Dow Chemical Company ("TDCC"). The LM-CPA proposes a novel reactor design—as the proposed four-unit, high-temperature gas-cooled, pebble bed reactors (HTGRs) would not only be some of the first of their kind internationally, but the proposed facility would be the first grid-scale advanced nuclear facility at an industrial site in North America.

Petitioner contends that the NRC should not grant the LM-CPA because LME has failed to demonstrate with reasonable assurance that the proposed functional containment will control the release of radioactivity to the environment under all "postulated accident conditions" sufficiently to fulfill the safety design objectives under 10 C.F.R. § 50.34. Additionally, Petitioner contends that the proposed functional containment fails to include beyond-design basis events (BDBEs) in the functional containment evaluation. Petitioner also contends that LME has failed to demonstrate its financial qualifications to build and operate the Long Mott Generating Station. Lastly, Petitioner contends that LME's Environmental Report erroneously minimizes the adverse environmental impacts of the proposed facility, undermining any required assessment under the National Environmental Policy Act (NEPA).

Petitioner's contentions are supported by the expert declarations of Dr. Edwin Lyman, an expert in nuclear power safety and security,[2] and Jeffrey T. Mitman, a nuclear engineer with a significant level of expertise in risk analysis.[3]

The remainder of this Hearing Request and Petition for Leave to Intervene proceeds as follows: Section II contains a demonstration that Petitioner Waterkeeper has standing to participate in this proceeding. Section III presents the legal framework for Petitioner's Hearing Request and Petition for Leave to Intervene. Section IV presents Petitioner's Contentions.

II. PETITIONING PARTY AND THE BASIS FOR LEGAL STANDING

A. San Antonio Bay Estuarine Waterkeeper

San Antonio Bay Estuarine Waterkeeper ("Waterkeeper") is a Calhoun County, Texas, membership organization founded in 2012 as a project of the non-profit Calhoun County Research Watch. Waterkeeper is a member of the national network of organizations in the Waterkeeper Alliance. Its mission is to monitor and protect the San Antonio, Matagorda, and Lavaca Bays by investigating and reporting violations of environmental permits, participating in the pollution permitting process, coordinating community actions and visits, and educating the public on the sources of pollution that impact Calhoun County. Commercial fishermen, marine biologists, volunteers, environmental advocates, and other community members work from within and with Waterkeeper to ensure compliance with

[2] Declaration of Dr. Edwin Lyman (Aug. 11, 2025). Dr. Lyman's Declaration is attached as Exhibit E.

[3] Declaration of Jeffrey T. Mitman (Aug. 11, 2025). Mr. Mitman's Declaration is attached as Exhibit F.

environmental laws and support recovery and cleanup projects in regional bays and waterways.

Waterkeeper advocates for the preservation of local waterways and wetlands for commercial fishing, sport, and other recreational uses, often working with shrimpers and oystermen who earn their livelihood fishing in waterbodies within 50 miles of the site of the proposed Long Mott Generating Station. Waterkeeper also regularly conducts outreach activities and communicates with the public through email newsletters, press releases, interviews, and its public social media accounts with almost 1,000 direct followers. Waterkeeper includes members who reside, recreate, and work within 50 miles of the proposed reactors and who will be affected by the reactor facility that is the subject of Long Mott Energy's Construction Permit Application.

Waterkeeper's address is 600 Ramona Road, Seadrift, Texas 77983, and it may be contacted at its phone number (361) 218-2353, email wilsonalamobay@aol.com, and website https://sanantoniobaywaterkeeper.org/.

Waterkeeper opposes the Construction Permit Application for the Long Mott Generating Station in Calhoun County, Texas. Waterkeeper's representational standing to participate in this proceeding is demonstrated by the attached declarations of its members: Declaration of Diane Wilson (August 11, 2025) (Exhibit A); Declaration of Mauricio Blanco (August 11, 2025) (Exhibit B); Declaration of Curtis Miller (August 11, 2025) (Exhibit C); and Declaration of John Daniel (August 11, 2025) (Exhibit D). Ms. Wilson, Mr. Blanco, Mr. Miller, and Mr. Daniel have designated Waterkeeper to represent their respective interests in this proceeding, including their health and safety and that of their

family members, the integrity of their real property, homes, and businesses, and the quality of the marine and estuarine environment from which their livelihoods, recreational uses, and aesthetic appreciation derive. They assert that they will not be adequately represented unless Waterkeeper is allowed to participate as a party on their behalf.

B. Legal Basis for Standing

Pursuant to the Atomic Energy Act, the Commission must grant a hearing in a licensing proceeding "upon the request of any person whose interest may be affected by the proceeding, and shall admit any such person as a party to such proceeding."[4] To support the request, a petitioner must provide the Commission with information regarding "(1) the nature of the petitioner's right under the governing statutes to be made a party; (2) the nature of the petitioner's property, financial, or other interest in the proceeding; and (3) the possible effect of any decision or order on the petitioner's interest."[5] "The NRC generally uses judicial concepts of standing in interpreting this regulation."[6] Thus, a petitioner may intervene if it can specify facts showing "that (1) it has suffered or will suffer a distinct and palpable harm constituting injury-in-fact within the zone of interests arguably protected by the governing statutes, (2) the injury is fairly traceable to the action being challenged, and (3) the injury will likely be redressed by a favorable determination."[7] In determining

[4] 42 U.S.C. § 2239(a)(1)(A).
[5] *Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), 60 N.R.C. 548, 552 (2004) (citing 10 C.F.R. § 2.309(d)(1)).
[6] *Entergy Nuclear Vermont Yankee*, 60 N.R.C. at 552.
[7] *Id.* at 552-53.

whether a petitioner has met the requirements for standing, the Commission "construe[s] the petition in favor of the petitioner."[8]

A petitioner seeking leave to intervene must show the potential for injury-in-fact to its interests before intervention can be granted.[9] A petitioner need not establish that injury will inevitably result from the proposed action to show an injury-in-fact, but only that it may be injured in fact by the proposed action.[10]

An organization that wishes to intervene in a proceeding may do so either in its own right by demonstrating harm to its organizational interests, or in a representational capacity by demonstrating harm to its members.[11] Organizations such as the Petitioner in this case may act as representational entities by demonstrating harm to their members.

An organization seeking representational standing must demonstrate how at least one of its members may be affected by the licensing action (such as by activities on or near the site), must identify that member by name and address, and must show that the organization is authorized to request a hearing on behalf of that member.[12] Even in the

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[8] *Id.* at 553.
[9] *Nuclear Eng'g Co., Inc.* (Sheffield, Ill. LowLevel Radioactive Waste Disposal Site), 7 N.R.C. 737, 743 (1978).
[10] *Gulf States Utils. Co., et al.* (River Bend Station, Unit 1), 40 N.R.C. 43 (1994).
[11] *See Hydro Resources, Inc.* (2929 Coors Road, Suite 101, Albuquerque, NM 87120), LBP-98-9, 47 N.R.C. 261, 271 (1998).
[12] *Warth v. Seldin*, 422 U.S. 490, 511 (1975) ("There is no question that an association may have standing in its own right to seek judicial relief from injury to itself and to vindicate whatever rights and immunities the association itself may enjoy. Moreover, in attempting to secure relief from injury to itself the association may assert the rights of its members, at least so long as the challenged infractions adversely affect its members' associational ties.") (citing *NAACP v. Alabama*, 357 U.S. 449, 458-460 (1958)); *Anti-Fascist Committee v. McGrath*, 341 U.S. 123, 183-87 (1951) (Jackson, J., concurring)).

absence of injury to itself, an association may have standing solely as the representative of its members.[13]

In this case, Waterkeeper is petitioning on behalf of its members, and it has submitted declarations from four of them. One member resides at 1714 FM2235, less than four miles northeast of the site of the proposed Long Mott Generating Station. The others reside in Port Lavaca (approximately 10 miles from the site of the proposed Long Mott Generating Station), Seadrift (approximately 15 miles from the site of the proposed Long Mott Generating Station), and Victoria (approximately 29 miles from the site of the proposed Long Mott Generating Station). Petitioner thus has presumptive standing by virtue of the location of its members' residences and property within 50 miles of the proposed LME reactors.[14] Further, they each have frequent contact with an area within a 50-mile radius of the proposed nuclear reactor.[15]

As each of the member declarants explains, they will suffer (or will be under threat of suffering) concrete and particularized injuries from granting of a Construction Permit Application for the Long Mott Generating Station. If the Construction Permit is denied, the potential threats or actual harms from the Long Mott Generating Station will not occur. By intervening in this proceeding, Petitioner seeks to protect its members' health and safety,

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[13] *E.g.*, *National Motor Freight Assn. v. United States*, 372 U.S. 246 (1963).
[14] *See, e.g., Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 & 4), LBP-08-18, 68 N.R.C. 533, 539 (2008); *Pacific Gas & Electric Co.* (Diablo Canyon Power Plant Independent Spent Fuel Storage Installation), LBP-02-23, 56 N.R.C. 413, 426-27 (2002) (petition for review denied, CLI-03-12, 58 N.R.C. 185 (2003)) (citing *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), LBP-01-06, 53 N.R.C. 138, 146, *aff'd*, CLI-01-17, 54 N.R.C. 3 (2001)); *Amergen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), LBP-06-7, 63 N.R.C. 188, 195 (2006).
[15] *Florida Power & Light Co.*, 68 N.R.C. at 539.

as well as protection of the environment. It seeks to ensure that LME's Construction Permit Application is not approved unless and until LME demonstrates full compliance with all applicable requirements.

III. LEGAL FRAMEWORK

The NRC's regulation and licensing of reactors is governed by two statutes: the Atomic Energy Act[16] and NEPA.[17] While the substantive concerns of these statutes overlap,[18] they impose independent procedural obligations.[19] Even where the NRC purports to have resolved safety issues through its Atomic Energy Act-based regulatory process, it must nevertheless comply with NEPA's procedural obligations for addressing those issues in its decision-making processes.[20] Additionally, contentions must be admissible under 10 C.F.R. § 2.309(f).

A. Atomic Energy Act and NRC Safety Regulations

Under § 103(d) of the Atomic Energy Act, the NRC may not issue a commercial license for a nuclear plant if it would be "inimical to the common defense and security or to the health and safety of the public."[21] Section 161 of the Atomic Energy Act also

[16] 42 U.S.C. § 2011, *et seq.*
[17] 42 U.S.C. §§ 4321-4370h.
[18] *Citizens for Safe Power v. NRC*, 524 F.2d 1291, 1299 (D.C. Cir. 1975).
[19] *Limerick Ecology Action v. NRC*, 869 F.2d 719, 729-31 (3rd Cir. 1989).
[20] *Limerick Ecology Action*, 869 F.2d at 729-31; *see also State of New York v. NRC*, 681 F.3d 471, 478 (D.C. Cir. 2012) ("a finding that 'reasonable assurance exists that sufficient mined geologic repository capacity will be available when necessary' . . . does not describe a probability of failure so low as to dismiss the potential consequences of such a failure.").
[21] 42 U.S.C. § 2133(d).

empowers the NRC to set standards "to protect health or to minimize danger to life or property," *inter alia*.[22]

NRC regulations under 10 C.F.R. Part 50, "Domestic Licensing of Production and Utilization Facilities," govern the criteria for construction permit applications. Among the many regulatory standards promulgated by the NRC for the safe construction and operation of nuclear power reactors, the General Design Criteria for Nuclear Power Plants ("GDCs") in Appendix A to 10 C.F.R. Part 50 are fundamentally important. These GDCs "are generally applicable to [non water-cooled] types of nuclear power units and are intended to provide guidance in establishing the principal design criteria for such other units," such as the one proposed here by LME.[23] These principal design criteria, in turn, establish:

> the necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety; that is, structures, systems, and components that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public.[24]

B. NEPA

NEPA implements a "broad national commitment to protecting and promoting environmental quality."[25] NEPA has two key purposes: to ensure that the agency "will have available, and will carefully consider, detailed information concerning significant environmental impacts" before it makes a decision; and to guarantee that "the relevant

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[22] 42 U.S.C. § 2201(b).
[23] 10 C.F.R. Part 50, App. A, Introduction.
[24] *Id.*
[25] *Louisiana Energy Services, L.P.* (Claiborne Enrichment Center), CLI-98-3, 47 N.R.C. 77, 87 (1998) (quoting *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348 (1989) and citing 42 U.S.C. § 4331).

information will be made available to the larger audience that may also play a role in the decision-making process and implementation of that decision."[26] A NEPA analysis must address harms that are "reasonably foreseeable," even if they are indirect.[27] The analysis must address "both the probabilities of potentially harmful events and the consequences if those events come to pass."[28]

C. Standard for Admissibility of Contentions

Section 189(a) of the Atomic Energy Act, 42 U.S.C. § 2239, provides:

> In any proceeding under this Act, for the granting, suspending, revoking, or amending of any license or construction permit, or application to transfer control, and in any proceeding for the issuance or modification of rules and regulations dealing with the activities of licensees, and in any proceeding for the payment of compensation, an award, or royalties under section 153, 157, 186c., or 188, the Commission shall grant a hearing upon the request of any person whose interest may be affected by the proceeding.

To carry out the provisions of the statute, the NRC has adopted a regulation, 10 C.F.R. § 2.309, regarding hearing requests and petitions to intervene. The regulation authorizes any person whose interest may be affected by a proceeding to intervene in the proceeding. Additionally, the petitioner must submit and have admitted at least one contention.

Pursuant to 10 C.F.R. § 2.309(f), a petitioner's contentions must: (1) provide a specific statement of the issue of law or fact to be raised or controverted; (2) provide a brief explanation of the basis for the contention; (3) demonstrate that the issue raised in the

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[26] *Robertson*, 490 U.S. at 349.
[27] *State of New York*, 681 F.3d at 476, 482.
[28] *State of New York*, 681 F.3d at 482 (rejecting environmental analysis of spent fuel pool fire risks because it did not consider consequences as well as probability of fires in spent fuel storage pools).

contention is within the scope of the proceeding; (4) demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding; (5) provide a concise statement of the alleged facts or expert opinions which support the petitioner's position on the issue and on which the petitioner intends to rely at hearing, together with reference to specific sources and documents on which the petitioner intends to rely; and (6) provide sufficient information to show that a genuine dispute exists with the licensee on a material issue of law or fact.

The NRC has made clear that the burden on a petitioner in stating its contentions is not heavy. In *Dominion Nuclear Conn., Inc.* (Millstone Nuclear Power Station, Units 2 & 3), 54 N.R.C. 349 (2001), the NRC described the contention admissibility standards as "insist[ing] upon some 'reasonably specific factual and legal basis' for the contention."[29] The NRC further explained in *Millstone* that the standards for contention admissibility were meant to prevent contentions based on "little more than speculation" and intervenors who had "negligible knowledge of nuclear power issues and, in fact, no direct case to present."[30] Rather, petitioners are required only to "articulate at the outset the specific issues they wish to litigate."[31]

The NRC and the courts have also made clear that the burden of persuasion is on the applicant, not the petitioner. The petitioner only needs to "com[e] forward with factual

[29] *Id.*, 54 N.R.C. at 359.
[30] *Id.* at 358.
[31] *Id.* at 359.

issues, not merely conclusory statements and vague allegations."[32] The NRC described the threshold burden in stating a contention as requiring a petitioner to "raise any specific, germane, substantial, and material factual issues that are relevant to the . . . request for a license. . . and that create a basis for calling on the [applicant] to satisfy the ultimate burden of proof."[33]

The standards are not meant to be insurmountable.[34] The rule serves to assess the scope, materiality, and support provided for a proposed contention, to ensure that the hearing process is "properly reserve[d] . . . for genuine, material controversies between knowledgeable litigants."[35]

IV. CONTENTIONS

CONTENTION 1: LME's proposed functional containment fails to demonstrate compliance with applicable regulations.

A. Statement of Contention

LME's proposed functional containment fails to satisfy the minimum criteria to demonstrate compliance with 10 C.F.R. § 50.34. Specifically, the LM-CPA fails to demonstrate with reasonable assurance that the proposed functional containment will control the release of radioactivity to the environment under all "postulated accident

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[32] *Northeast Nuclear Energy Company* (Millstone Nuclear Power Station, Unit 3), 53 N.R.C. 22, 27 (2001).
[33] *Id.*
[34] *Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, and 3), 49 N.R.C. 328, 335 (1999) (explaining that the rule should not be used as a "fortress to deny intervention") (internal quotation marks and citation omitted); *see Entergy Nuclear Operations, Inc.* (Palisades Nuclear Plant and Big Rock Point Site), 96 N.R.C. 1, 104-05 (2022) (admitting for hearing portions of a contention that raised a genuine material dispute with the application).
[35] *FirstEnergy Nuclear Operating Co.* (Davis-Besse Nuclear Power Station, Unit 1), 75 N.R.C. 393, 396 (2012) (internal quotation marks omitted).

conditions" sufficiently to fulfill the safety design objective of meeting "10 CFR 50.34 offsite dose requirements at the plant's exclusion area boundary with margins," as stated in the NRC Regulatory Guide 1.232.

B. Basis

1. Principal Design Criteria

NRC Rule 10 C.F.R. § 50.34 requires applicants seeking construction permits to include a preliminary safety analysis report (PSAR), which must include the principal design criteria (PDC) for the facility.[36] The PDC establish the necessary requirements for structures, systems, and components (SSCs) that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public.[37]

The rule includes General Design Criteria (GDC), which establish minimum requirements for the PDC for water-cooled nuclear power plants. These GDC are also generally applicable to non-water-cooled facilities, and they provide guidance in establishing the PDC for such other units.[38]

NRC staff have issued Regulatory Guidance for developing PDC for non-light-water reactors.[39] The regulatory guidance document includes a chart that lists the GDC (from Part 50, Appendix A) and indicates whether and how the staff propose to modify the GDC for non-light-water reactor facilities, including for modular high-temperature gas-

[36] 10 C.F.R. § 50.34(a)(3).
[37] 10 C.F.R. Part 50, App. A.
[38] *Id.*
[39] Regulatory Guide 1.232, Rev. 0, "Guidance for Developing Principal Design Criteria for Non-Light-Water Reactors" (April 2018) (hereinafter, "RG 1.232") (ML17325A611).

cooled reactors (MHTGRs), such as the one proposed by the LM-CPA.[40] The chart also includes staff's rationale for any proposed modifications to the GDC.

In addition, the Interim Staff Guidance (ISG), Review of Risk-Informed, Technology-Inclusive Advanced Reactor Applications—Roadmap, DANU-ISG-2022-01 (March 2024) (ML23277A139) (hereinafter, cited as DANU-ISG-2022-01) provides criteria used to evaluate the adequacy of proposed mechanistic source terms for the functional containment demonstration.

Together, the above regulation and regulatory guidance documents inform the evaluation of the LM-CPA's preliminary safety analysis report.

2. The Xe-100 reactor design in the Long Mott Construction Permit Application fails to meet the PDC for "Containment Design."

For purposes of this contention, Advanced Reactor Design Criterion (ARDC) 16 (Containment) of RG 1.232, as modified for MHTGRs (and thus denoted as MHTGR-16) is relevant, as it discusses the functional containment demonstration that the LM-CPA must include:

> A reactor functional containment, consisting of multiple barriers internal and/or external to the reactor and its cooling system, shall be provided to control the release of radioactivity to the environment and to ensure that the functional containment design conditions important to safety are not exceeded for as long as postulated accident conditions require.[41]

Importantly, staff's rationale for modifying PDC 16 for MHTGRs specifically cited the condition that "approval of the proposed approach to functional containment for the

[40] *See generally* RG 1.232, App. C.
[41] RG 1.232, App. C, p. C-8.

MHTGR concept, with its emphasis on passive safety features and radionuclide retention within the fuel over a broad spectrum of off-normal conditions, would necessitate that the required fuel particle performance capabilities be demonstrated with a high degree of certainty."[42]

By any reasonable standard, the LM-CPA does not demonstrate "the required fuel performance capabilities … with a high degree of certainty," as required. As explained in Dr. Lyman's Declaration, the reasons the LM-CPA does not satisfy this standard is that "an approved evaluation model and experimental information essential for determining fuel performance capabilities and developing mechanistic source terms are not available at the present time and will not be available until commercial-scale fuel produced under prototypical conditions has been fully tested over a sufficiently 'broad spectrum of off-normal conditions.'"[43] The development of sufficiently accurate mechanistic source terms is a fundamental step for evaluating the ability of the functional containment, in the LM-CPA, to meet regulatory requirements.[44] As Dr. Lyman explains, the essential information that is missing from the LM-CPA includes: "(1) demonstrated fuel fabrication defect rates and (2) radionuclide release fractions from as-manufactured fuel at the peak temperatures predicted in certain design basis events in the LM-CPA, which have not been

[42] *Id.*, p. C-9 (quoting from NRC staff's "Next Generation Nuclear Plant—Assessment of Key Licensing Issues").
[43] Exhibit E, p. 3 (quoting RG 1.232, p. C-9).
[44] *See* X Energy, LLC (X-energy) Xe-100 Licensing Topical Report Mechanistic Source Term Approach, Revision 3 (Mar. 14, 2025) (ML25073A094).

experimentally determined."[45] The inadequacy of the MSTs proposed by LME is discussed further below.

Because there is no approved evaluation model for mechanistic source term development at this stage, the only option for LME to evaluate the adequacy of its proposed functional containment would be to use a deterministic source term based upon a "major accident," as required by 10 C.F.R. § 50.34(a)(1)(ii)(D). However, the LM-CPA contains no such evaluation.

Therefore, in the absence of such an evaluation, to meet the letter and the intent of RG 1.232, Appendix C, Criterion 16, the Xe-100 design referenced in the LM-CPA would have to include a conventional, essentially leak-tight containment structure to ensure compliance with 10 C.F.R. § 50.34. This is consistent with the recommendation made by NRC staff, in its 1995 draft MHGTR preapplication safety review, wherein staff stated that a prototype MHTGR with a low-leakage containment should be considered if the "necessary design and quality of the fuel to meet the performance objectives" has not been demonstrated.[46] But the Xe-100 design in the LM-CPA does not include a physical, leak-tight containment structure.

Accordingly, the LM-CPA fails to demonstrate with reasonable assurance that its proposed containment design will control the release of radioactivity to the environment under all "postulated accident conditions" sufficiently to fulfill the safety design objective

[45] Exhibit E, p. 3.
[46] *See* Draft Copy of Preapplication-Safety Evaluation Report (PSER) on the Modular High-Temperature Gas-Cooled Reactor (MHTGR) (Mar. 26, 1996) (ML052780519).

of meeting "10 CFR 50.34 offsite dose requirements at the plant's exclusion area boundary (EAB) with margins."[47]

3. The mechanistic source terms in the LM-CPA's functional containment demonstration fail to meet the minimum criteria for adequacy.

The adequacy of the functional containment depends on the adequacy of the MST determination. But as explained by Dr. Lyman in his Declaration and as summarized below, the MSTs fail to satisfy the minimum criteria for adequacy.[48]

(a) The computer code used in the LM-CPA to determine the mechanistic source terms critical for demonstrating the acceptability of the functional containment approach has not been approved by the NRC. Indeed, it has not even been submitted yet for review. (This is discussed in more detail in Dr. Lyman's Declaration.)

(b) The LM-CPA provides no manufacturing defect data obtained from sampling industrial-scale, representative fuel to justify the assumptions made about TRISO pebble performance under normal and accident conditions. Thus, it cannot demonstrate that those assumptions are conservative when evaluating the adequacy of the functional containment to meet regulatory requirements. (This is discussed in more detail in Dr. Lyman's Declaration.)

(c) The LM-CPA analysis of the "extreme case" "depressurized loss of forced circulation" (DLOFC) event, which occurs during a number of the design basis accidents (DBAs) evaluated, results in maximum fuel temperatures approaching 2000°C for nearly two days, and sustains peak temperatures of over 1800°C for a period of several days after that. This is well outside of the bounds established by the LM TRISO fuel qualification Topical Report (TR) from the experimental database for TRISO UCO fuel. Thus, any assumptions made in the LM-CPA about the performance of its fuel under such conditions that support the development of MSTs have not been validated. And the LM-CPA analyses of DBAs including DLOFCs supporting the adequacy of the functional containment to meet regulatory requirements are invalid. Accordingly, there is considerable uncertainty and the possibility that the MST

[47] RG. 1.232, p. C-8 (Criterion 16).
[48] *See generally* DANU-ISG-2022-01, Appendix C.

and radiological consequences for the Seismic DBA are significantly underestimated. (This is discussed in more detail in Dr. Lyman's Declaration.)

(d) The methodology used in the LM-CPA for calculation of the core radionuclide inventory has large uncertainties and possibly even errors that have resulted in an underestimate of the total radionuclide inventory and hence the MSTs used to justify the adequacy of the functional containment. (This is discussed in more detail in Dr. Lyman's Declaration.)

(e) There are limited to no experimental measurements of iodine or tellurium releases from TRISO fuel in temperature transients. As these are significant contributors to offsite dose, this lack of data introduces significant uncertainty into the MST calculations supporting the adequacy of functional containment.

(f) The Advanced Gas Reactor (AGR) program test data for UCO fuel is only available for compacts rather than the pebble fuel forms that the Xe-100 will use. This has been noted as a significant limitation in the use of AGR data for assessing the effectiveness of the Xe-100 fuel matrix as a component of the functional containment.[49]

(g) There has been no testing of sufficiently representative fuel manufactured at a commercial scale. X-Energy's plan to conduct such testing at Idaho National Laboratory is highly unlikely to yield results in time to inform the NRC's decision on the LM-CPA's proposed functional containment.

(h) There is no experimental data available on steam ingress and its effect on the Xe-100 core. This phenomenon could have a significant impact on the MST used to assess the adequacy of functional containment. The Department of Energy is constructing a furnace to conduct such tests, but the schedule is uncertain, and again, it is unclear when useful data will be available for incorporation into the MST model.

Taken together, the above deficiencies indicate that the MSTs relied on in the LM-CPA for the functional containment demonstration are not reliable and do not comply with DANU-ISG-2022-01.[50]

[49] X Energy—Safety Evaluation of XE-100 Topical Report, "TRISO-X Pebble Fuel Qualification Methodology," Revision 3, p. 6 (Mar. 9, 2023) (ML22327A201).

[50] *See also* SECY-18-0096: Enclosure 2—Functional Containment Performance Criteria Technology-Inclusive, Risk-Informed, Performance-Based Approach (Sept. 28, 2018) (ML18115A367).

4. The LM-CPA does not conform to the limitations imposed by NRC staff in response to LME's Topical Report regarding the fuel qualification program and thus, does not provide an adequate demonstration that the proposed functional containment satisfies the requirements in 10 C.F.R. § 50.34.

The LM-CPA references the X-Energy Fuel Qualification Topical Report, Revision 3 (ML22216A179). The staff approved this report in March 2023 subject to three limitations and conditions (ML22327A201). They are as follows:

1. Applicants referencing the Technical Report (TR) should provide a justification for releases from defect particles, contamination in the fuel matrix, and diffusion of volatile radionuclides in addition to the intact particle failure fraction derived from the testing to be used in a future licensing application. In effect, this methodology forms a portion of the fuel qualification for the final reactor fuel form, but not the entirety of the fuel qualification process for the performance of the fuel (e.g., cover the aspects cited above or the more comprehensive list of fuel qualification areas in NUREG-2246).

2. This approval is limited to the plan to test TRISO fuel and the operational envelope (temperature, burnup, and environmental conditions) outlined in the TR. Applicants referencing the TR should provide a set of fuel specifications and demonstrate how fuel to be used in the reactor will meet these specifications. Future licensing submittals will be needed to qualify the fuel for the totality of the operational regime, including but not limited to transient accident conditions and mechanical effects to the extent that these are not incorporated within the scope of the TR.

3. An applicant referencing the TR is subject to the limitations and conditions associated with the approved EPRI TRISO TR.

The LM-CPA does not conform to these limitations. X-Energy's plan to address this problem is through a testing program. As explained by Dr. Lyman in his Declaration, X-Energy publicly disclosed that it was planning to conduct such testing at Idaho National Laboratory, including irradiation and transient testing.[51] However, no schedule for the

[51] Exhibit E, p. 12.

testing was presented publicly, and given the current unavailability of as-manufactured fuel from the yet-to-be-built TRISO-X facility, as well as the length of time such tests have taken historically to yield data, it is unlikely that useful results from such testing will be available by the time the NRC has committed to make a licensing decision on the LM-CPA.

5. LME's proposal to conduct fuel testing in the future does not comply with the requirements of 10 C.F.R. § 50.34(a)(4) and (a)(8).

10 C.F.R. § 50.34(a)(4) requires that the preliminary safety analysis report include:

> A preliminary analysis and evaluation of the design and performance of structures, systems, and components of the facility with the objective of assessing the risk to public health and safety resulting from operation of the facility and including determination of the margins of safety during normal operations and transient conditions anticipated during the life of the facility, and the adequacy of structures, systems, and components provided for the prevention of accidents and the mitigation of the consequences of accidents.

And 10 C.F.R. § 50.34(a)(8) requires the preliminary safety analysis report to include:

> An identification of those structures, systems, or components of the facility, if any, which require research and development to confirm the adequacy of their design; and identification and description of the research and development program which will be conducted to resolve any safety questions associated with such structures, systems or components; and a schedule of the research and development program showing that such safety questions will be resolved at or before the latest date stated in the application for completion of construction of the facility.

The LM-CPA fails to satisfy these requirements. This is because the latest date for completion of construction cited in the LM-CPA is 2033.[52] As explained above, and in Dr.

[52] LM-CPA Part I-1 (pdf p. 2).

Lyman's Declaration, X-Energy is unlikely to be able to conduct the necessary testing and obtain all results by then; LME has not demonstrated otherwise.

6. The LM-CPA fails to include an evaluation using a deterministic source term based upon a "major accident," and does not qualify for an exemption from this requirement.

Because the MST model is not acceptable for demonstrating the adequacy of the functional containment, the LM-CPA must include an evaluation and analysis of the postulated fission product release based on a "major accident" resulting in a "substantial meltdown of the core with subsequent release into the containment of appreciable quantities of fission products."[53] The LM-CPA is requesting a partial exemption from this requirement based, in part, on the claim that "core meltdown is not credible at the temperatures experienced in this non-metallic core."[54] But as discussed above, and as explained in Dr. Lyman's Declaration, it is reasonable to assume that "appreciable quantities of fission products" can be released at the temperatures greater than 1800°C that result from the DLOFC due to fuel damage. Thus, whether this constitutes a "meltdown," is a distinction without a difference—particularly when considering the radiological consequences of such an event. Even a partial exemption would present an undue risk to public health and safety and contravene the purpose of the PSAR rules.[55]

[53] 10 C.F.R. § 50.34(a)(1)(ii)(D) & n.3.
[54] LM-CPA 3.2-4 (pdf p. 1094).
[55] *See* 10 C.F.R. § 50.12.

C. This Contention Is Within the Scope of This Proceeding

This Contention is within the scope of the LME licensing proceeding because it seeks compliance with 10 C.F.R. § 50.34, which applies to construction permit applications.

D. This Contention Is Material to the Findings the NRC Must Make to Grant the LM-CPA

The failure to include a physical, leak-tight containment structure in the Xe-100 design at the construction permit application stage is a major omission that will have significant implications, not only for the LM-CPA decision-making process, but also for the operating license review. If NRC were to approve the LM-CPA, and if analysis results and experimental data obtained after such approval and the start of construction fail to support the assumptions in the LM-CPA regarding the adequacy of the functional containment, then the applicant will have to redesign the reactor to include a physical containment, and it will have to do so before obtaining an operating license. However, if LME has not undertaken all necessary actions at this CPA stage to ensure that it can install a physical containment in the event of this contingency, then the NRC will have no assurance that the company will have the financial and technical means to do so.

In sum, this contention must be addressed during this CPA licensing process.

E. Facts or Expert Opinion Supporting the Contention, Along with Appropriate Citations to Supporting Scientific or Factual Materials

The facts, expert opinions, and scientific materials that support this contention are included in Dr. Lyman's Declaration (Exhibit E) and in the discussion of the "Basis" for the contention, above.

CONTENTION 2: LME's functional containment fails to include beyond-design basis events (BDBEs) in the functional containment evaluation.

A. Statement of Contention

The LM-CPA does not comply with 10 C.F.R. § 50.34 and MHTGR-16 because it does not include beyond-design basis events (BDBEs) in the spectrum of accidents considered in the functional containment evaluation. This is inconsistent with the historical defense-in-depth function of the containment in mitigating the consequences of beyond-design-basis accidents, as demonstrated during the Fukushima Daiichi disaster and as explained by Dr. Lyman in his Declaration.

B. Basis

The role of the containment in mitigating both design-basis and beyond-design-basis accidents (also known as severe accidents) has been fully established by historical examples, as well as NRC guidance and regulations. Dr. Lyman discusses three historical examples in his Declaration: Three Mile Island, Chernobyl, and Fukushima.[56]

In policy and guidance, the defense-in-depth role of the containment is similarly established. In SRM-SECY-10-0121, the Commission reaffirmed "that the existing safety goals, safety performance expectations, subsidiary risk goals and associated risk guidance (such as the Commission's 2008 Advanced Reactor Policy Statement and Regulatory Guide 1.174), key principles and quantitative metrics for implementing risk-informed decision making, are sufficient for new plants."[57] Those performance expectations and

[56] Exhibit E, p. 13.
[57] SRM-SECY-10-0121 – Modifying the Risk-Informed Regulatory Guidance for New Reactors, p. 1 (Mar. 2011) (ML110610166).

subsidiary risk goals are defined in the Final Standard Review Plan (NUREG-0800), Chapter 19, "Probabilistic Risk Assessment and Severe Accident Evaluation for New Reactors" (2015) (ML15089A068), which provides acceptance criteria that apply to the probable risk assessment (PRA) and to severe accidents in general for new reactors.

These include determining "whether the applicant has adequately demonstrated that the risk associated with the design compares favorably against the Commission's goals of less than 1 x 10 -4 per year (/yr) for CDF [core damage frequency] and less than 1 x 10 -6/yr for LRF [large release frequency],"[58] as well as "whether the design compares favorably with the Commission's approved use of a CPG [containment performance goal], which includes (1) a deterministic goal that containment integrity be maintained for approximately 24 hours following the onset of core damage for the more likely severe accident challenges and (2) a probabilistic goal that the conditional containment failure probability be less than 0.1 for the composite of all core-damage sequences assessed in the PRA."[59] Additional criteria include, "whether the applicant has adequately demonstrated that the design properly balances preventive and mitigative features and represents a reduction in risk when compared to existing operating plants."[60]

Finally, the role of the containment as a defense-in-depth feature for beyond-design-basis accidents is established in numerous regulations, including 10 C.F.R. § 50.155, "Mitigation of beyond-design-basis events." This rule includes provision (b)(1)(i)

[58] NUREG-0800, p. 19.0-11.
[59] *Id.*
[60] *Id.*

requiring applicants and licensees to develop strategies and guidelines for "maintaining or restoring core cooling, containment, and spent fuel pool cooling capabilities" during a "beyond-design basis external event."[61]

Thus, due to the failure of the LM-CPA to evaluate the performance of its claimed "functional containment" for beyond-design-basis event sequences, it does not ensure compliance with the containment performance acceptance criteria that the NRC has established for all new reactors.

C. This Contention Is Within the Scope of This Proceeding

This Contention is within the scope of the LME licensing proceeding because it addresses LM-CPA's functional containment demonstration and its failure to comply with 10 C.F.R. § 50.34, which applies to construction permit applications.

D. This Contention Is Material to the Findings the NRC Must Make to Grant the LM-CPA

The NRC's establishment of containment performance goals for all "new reactors" during severe accidents makes clear that the NRC expects the proposed containment to play a significant role in severe accident mitigation, which must be addressed during this construction permit phase.

E. Facts or Expert Opinion Supporting the Contention, Along with Appropriate Citations to Supporting Scientific or Factual Materials

The facts supporting Waterkeeper's Contention are stated in the Contention itself, in Dr. Lyman's Declaration, and in the supporting materials cited in his Declaration and in the discussion of the "Basis" for this Contention.

[61] 10 C.F.R. § 50.155(b)(1)(i).

CONTENTION 3: LME has failed to demonstrate its financial qualifications to build and operate the LMGS.

A. Statement of Contention

NRC safety regulations for construction permits require a detailed demonstration that the applicant is financially qualified to build and operate the facility.[62] As LME acknowledges, the "underlying purpose" of these regulations "is to protect public health and safety by preventing safety lapses during construction from underfunded projects."[63] Instead of seeking to demonstrate fulfillment of 10 C.F.R. § 50.33(f) and Appendix C, however, LME seeks an exemption, requesting that it be held to the more lenient standard of 10 C.F.R. § 70.23(a)(5) of merely "appear[ing] to be financially qualified.[64] But LME has failed to satisfy the requirements for an exemption set forth in 10 C.F.R. § 50.12 or to meet the judicial standard of "extraordinary circumstances."[65] Its reliance on a disapproved draft proposed rule and an unrelated licensing proceeding are inapposite. And even if it were lawful to apply 10 C.F.R. § 70.23(a)(5), LME does not meet that standard because it has failed to make a sufficient demonstration of financial commitments to ensure the uninterrupted availability of sufficient finances to build and operate the project. In fact, LME's rationale rests on the premise that ARDP funding will cover 50% of its costs, but this is misleading and inaccurate, with ARDP funding more accurately covering at most 21%-26%.

[62] 10 C.F.R. § 50.33(f) and 10 C.F.R. Part 50, Appendix C.
[63] LM-CPA Part V at V-XVI (pdf. p. 18).
[64] *Id.* at V-X (pdf p. 11).
[65] *NRDC v. NRC*, 695 F.2d 623, 625 (D.C. Cir. 1982).

B. Basis

1. LME Fails to Demonstrate its Financial Qualifications Under 10 C.F.R. § 50.33(f) and Appendix C to Part 50.

Under 10 C.F.R. § 50.33(f) and 10 C.F.R. Part 50, Appendix C, a reactor construction permit applicant must provide:

> (1). . . information that demonstrates that the applicant possesses or has reasonable assurance of obtaining the funds necessary to cover estimated construction costs and related fuel cycle costs. The applicant shall submit estimates of the total construction costs of the facility and related fuel cycle costs, and shall indicate the source(s) of funds to cover these costs.
>
> . . . (4) Each application for a construction permit, operating license, or combined license submitted by a newly-formed entity organized for the primary purpose of constructing and/or operating a facility must also include information showing:
>
> > (i) The legal and financial relationships it has or proposes to have with its stockholders or owners;
> >
> > (ii) The stockholders' or owners' financial ability to meet any contractual obligation to the entity which they have incurred or proposed to incur; and
> >
> > (iii) Any other information considered necessary by the Commission to enable it to determine the applicant's financial qualification.
>
> (5) The Commission may request an established entity or newly-formed entity to submit additional or more detailed information respecting its financial arrangements and status of funds if the Commission considers this information appropriate. This may include information regarding a licensee's ability to continue the conduct of the activities authorized by the license and to decommission the facility.[66]

Appendix C further requires:

> "If the sources of funds relied upon include parent companies or other corporate affiliates, information to support the financial capability of each such company or affiliate to meet its commitments to the applicant should be set forth in the application. This information should be of the same kind and scope as would be required if the parent companies or affiliates were in fact the applicant. Ordinarily,

[66] 10 C.F.R. § 50.33(f).

it will be necessary that copies of agreements or contracts among the companies be submitted."

Furthermore, 10 C.F.R. § 50.33(f) and 10 C.F.R. Appendix C to Part 50 impose additional requirements on newly-formed entities to provide more detailed information about "the applicant's legal and financial relationships with its stockholders, corporate affiliates, or others (such as financial institutions) upon which the applicant is relying for financial assistance."[67]

LME completely fails to satisfy these requirements; in fact, LME doesn't even try.[68] Instead, LME argues 70.23(a)(5) applies, and provides a mere two-page appendix to Part I of the LM-CPA as its Financial Capacity Plan.[69] "Long Mott Energy, LLC, Financial Capacity Plan for Construction of the Long Mott Generating Station." This appendix includes only two statements of direct relevance to the LM-CPA, neither of which are sufficient to show LME is financially qualified to construct a nuclear facility; the remainder are merely about LME's parent company, the Dow Chemical Company ("TDCC"), which also has no evidenced experience constructing a nuclear facility, much less a first-of-its-kind reactor.[70]

LME also does not dispute that it is a "newly-formed entit[y] organized primarily for the purpose of engaging in the activity for which the permit is sought." It also states that it will rely on TDCC for financial support and Advanced Reactor Demonstration

[67] 10 C.F.R. Appendix C to Part 50.
[68] *See* LM-CPA Part I at I-III – I-IX (pdf pp. 4-10); *see also* Part V at V-X – V-XVII (pdf pp. 11-18) (applying only 10 C.F.R. § 70.23(a)(3)).
[69] *Id.* at I-VII – I-IX (pdf pp. 8-10).
[70] *Id.*

Program ("ARDP") funding. As such, and as LME's parent, TDCC is required under Appendix C to supply the same kind and scope of information as if it were the applicant itself. This would include at a minimum a statement of assets, liabilities, and capital structure, as well as TDCC's legal and financial relationships with those it is relying on for financial assistance.[71] Balance sheets and income statements for prior operations are also requested.[72] This information from TDCC is missing from the application.

Appendix C further states that "[t]he application should specifically identify the source or sources upon which the applicant relies for the funds necessary to pay the cost of constructing the facility, ***and the amount to be obtained from each***." LME does not specify the amount of funding that it will obtain from TDCC. Furthermore, LME asserts only that ARDP will provide 50% of the costs, but it does not identify the ***amount*** of ARDP funding. In fact, as described further below, its estimate that 50% of the costs are covered is likely inaccurate. These are two of the omissions that render the LM-CPA insufficient.

a) LME fails to submit sufficient information about itself and the ARDP grant to establish its financial qualifications.

LME asserts that: "An intercompany agreement is in place ensuring TDCC will provide financial support to LME for construction of LMGS."[73] Ordinarily, under 10 C.F.R. Part 50 Appendix C, "it will be necessary that copies of agreements or contracts

[71] 10 C.F.R. App. C(II)(A)(2).
[72] 10 C.F.R. App. C(II)(A)(2).
[73] LM-CPA Part I-IX (pdf. p. 10).

among the companies be submitted."[74] However, LME did not include a copy of its intercompany agreement as part of the LM-CPA, and thus the details of this purported agreement are unclear. Without the details of the agreement, it is unclear the amount of "financial support" TDCC may provide, conditions precedent to the provision of that support, and all other details that would be pertinent to establishing that LME has the requisite financial qualifications, whether under the applicable requirements of 10 C.F.R. § 50.33(f) or even the subjective standard of 10 C.F.R. § 70.23(a)(5). Nor does the LM-CPA provide any other information detailing how LME itself will navigate the complexities of the project's financing requirements.

LME then misleadingly asserts that half of LMGS's total construction costs—a total that has been redacted in the LM-CPA—will be paid by the U.S. Department of Energy (DOE) through a grant program, stating that:

> In May 2022, the Department of Energy announced the Advanced Reactor Demonstration Program (ARDP) to facilitate the transition of next generation nuclear reactors from concept to demonstration through cost-share partnerships. In October 2020, X-Energy, LLC, with its Xe-100 high-temperature gas-cooled reactor (HTGR), was selected to deliver a commercial first-of-a-kind advanced nuclear plant with partner Energy Northwest. In March 2023, the DOE agreed to make Dow a sub-awardee under the ARDP agreement, moving this funding from Energy Northwest. The ARDP provides a 50 percent DOE/private sector cost share on all projected costs to deliver LMGS.[75]

[74] 10 C.F.R. Part 50 Appendix C: "If the sources of funds relied upon include parent companies or other corporate affiliates, information to support the financial capability of each such company or affiliate to meet its commitments to the applicant should be set forth in the application. This information should be of the same kind and scope as would be required if the parent companies or affiliates were in fact the applicant. Ordinarily, it will be necessary that copies of agreements or contracts among the companies be submitted."

[75] LM-CPA Part I-IX (pdf. p. 10).

As an initial matter, problematically, LME does not attach the ARDP award contract to the LM-CPA to substantiate its claims as to what costs DOE will cover, and what conditions might limit reimbursement through the award. Moreover, LME's statement omits certain facts that would otherwise reveal that DOE's award is unlikely to cover 50 percent of LME's construction costs. Not only would this increase the costs that LME would have to finance on its own—rendering information about its own independent financial qualifications even that much more relevant—it also cuts against LME's arguments that the subjective standard of 10 C.F.R. § 70.23(a)(5) applies.

A more realistic picture of the likely amount of cost-sharing DOE will contribute becomes apparent when considering the following facts that LME omitted from the LM-CPA, and strongly suggests that only up to 21-26% of LME costs might be covered by DOE, not the 50% LME claims:

- **X-Energy's DOE Award is Limited.** In 2021, Congress authorized a one-time appropriation of $3.211 billion to DOE to fund the ARDP, including $2.5 billion for awards to two companies for construction of demonstration projects: X-Energy and Terrapower. In November 2021, X-Energy issued a statement that its share of the appropriation would be approximately $1.1 billion ("~$1.1B").[76] In 2023, X-Energy updated the total amount of DOE funding through the ARDP to be $1.23 billion, including a 2020 disbursement of $80 million.[77]

- **The Limited Award Will Be Split with a Second Project.** X-Energy's ARDP award is to be split between not one but two of its construction projects: this project

[76] Exhibit G, X-Energy, "Congress Appropriates ~$1.1B Dollars to X-Energy's ARDP Project with Historic Legislation Recognizing Clean Energy Supply as vital to US Infrastructure and Economic Health," November 15, 2021, see https://X-Energy.com/media/news-releases/congress-appropriates-1-billion-dollars-to-X-Energys-ardp-project, accessed August 5, 2025.

[77] Exhibit H, X-Energy, "X-energy and Ares Acquisition Corporation Announce Strategic Update to Business Combination Terms to Reinforce Long-Term Value Creation Opportunity and Alignment with Shareholders," June 12, 2023, see https://x-energy.com/media/news-releases/x-energy-ares-acquisition-corporation-announce-strategic-update-to-business-combination-terms, accessed August 5, 2025.

(the LMGS) and X-Energy's TRISO-X fuel fabrication plant, to be located in Tennessee.[78] DOE has stated that funding for the awards is subject to significant contingencies, including further Congressional appropriations and DOE's evaluation of the project's progress: "Funding beyond the near-term is contingent on additional future appropriations, evaluations of satisfactory progress and DOE approval of continuation applications."[79]

- **Costs for the Two Projects are at least $4.75 Billion.** In June 2023, X-Energy issued an updated cost projection for the two facilities: "The Company completed its most recent review of design processes and related costs on March 31, 2023. As a result, X-energy updated its cost estimates to complete the full ARDP scope to a total of between $4.75 and $5.75 billion. This scope includes the design and licensing of the Xe-100 standard plant, the design, licensing, and construction of the TRISO-X commercial fuel fabrication facility, and the construction of a four-unit Xe-100 facility at the Dow Inc. ("Dow") UCC Seadrift Operations site (the "Seadrift site") in Texas." No public information has been located as to the cost of either project alone.

In sum, only up to 21-26% of construction costs for the LME facility are currently likely to be eligible for ARDP reimbursement. [80] Thus, LME has no guarantee that 50% of the construction costs will be paid by DOE, increasing the share of the costs that it must finance to at least 74% to 79%.

In addition, despite X-Energy providing an updated cost projection in 2023, Congress has not acted to appropriate additional funds sufficient to cover 50% of those costs. Moreover, the ARDP award is structured as a reimbursement program, requiring

[78] Exhibit I, U.S. Department of Energy, "U.S. Department of Energy Announces $160 Million in First Awards under Advanced Reactor Demonstration Program," October 13, 2020, see https://www.energy.gov/ne/articles/us-department-energy-announces-160-million-first-awards-under-advanced-reactor, accessed August 5, 2025.
[79] *Id.*
[80] This assumes that ARDP funding will be split evenly between both of the X-Energy projects---a reasonable assumption to make given the fact LME has not provided the necessary information to determine the costs of each project individually nor the full details of the ARDP grant. In other words, total grant divided by total cost of the two projects: $1.23 B / ($ 5.75 B) * 100% = 21% and $1.23 B / ($ 4.75 B) * 100% = 26%.

LME to cover construction costs itself, and then apply to DOE for reimbursement of 50% of that amount.[81] Once X-Energy and LME have exhausted the available ARDP funding (in whatever amounts Congress has made available), LME will be liable to finance the remaining construction costs, with no guarantee of further DOE funding.

b) The information provided about LME's relationship with TDCC does not suffice to satisfy 10 C.F.R. § 50.33(f) and Appendix C.

LME's two-page disclosure also includes general statements asserting that TDCC, of which LME "is a wholly owned subsidiary," has the experience and financial capacity to manage large industrial construction projects; but notably, none of this experience is in the extremely specialized field of nuclear reactor construction. LME cites examples of two multi-billion-dollar petrochemical plant construction projects that TDCC has undertaken in recent years and reports that TDCC "has reported annual capital spending of $2.5 billion/year on average over the recent years since 2021," which it finances "through a combination of debt and equity sources, including cash flow from operations, bonds and the issuance of new debt." Even if this were relevant, which it is not, LME has only bare assertions that it could rely on its parent company's financial and project management capacity, having provided no details about the specific financial agreements between LME and TDCC for this project.

[81] Exhibit J, U.S. Government Accountability Office, NUCLEAR ENERGY PROJECTS: DOE Should Institutionalize Oversight Plans for Demonstrations of New Reactor Types, September 2022, see https://www.gao.gov/assets/gao-22-105394.pdf, accessed August 11, 2025.

2. LME Fails to Satisfy the Regulatory or Judicial Standards for an Exemption.

Even though 10 C.F.R. § 50.33 and Appendix C apply, LME seeks an exemption.[82] But for LME to be exempt from the requirements of 50.33 and Appendix C, LME must meet the standard for an exemption under 10 C.F.R. § 50.12. To be granted, an exemption must be (1) "[a]uthorized by law, . . . not present an undue risk to the public health and safety, and [be] consistent with the common defense and security" and (2) in response to "special circumstances."[83] LME fails to make these necessary showings.[84] And the District of Columbia Circuit has limited the granting of 50.12 exemptions to "extraordinary circumstances":

> Section 50.12 provides a mechanism for obtaining an exemption from the procedures incorporated in section 50.10, but one that may be invoked only in extraordinary circumstances. The Commission has made clear that section 50.12 is available "only in the presence of exigent circumstances, such as emergency situations in which time is of the essence and relief from the Licensing Board is impossible or highly unlikely." [citing *Washington Public Power Supply System*, 5 NRC 719, 723 (1977)].[85]

a) This exemption would present undue risk to public health and safety in violation of 10 C.F.R. § 50.12(a)(1).

First, LME relies on statements from a never-finalized, disapproved draft proposed rule to make its showing that the exemption would not present undue risk to public health and safety, stating that evolving oversight programs and processes reduce the need to rely

[82] LM-CPA Part I-III (pdf p. 4).
[83] 10 C.F.R. § 50.12(a)(2)(i)-(vi).
[84] Furthermore, a showing that these elements have been met does not bind the NRC to grant an exemption; it then "may" grant an exemption only after considering and balancing the factors in 10 C.F.R. § 50.12(b)(1)-(4).
[85] *NRDC v. NRC*, 695 F.2d 623, 625 (D.C. Cir. 1982).

on financial qualifications.[86] This rulemaking, described further below in this Section 2, was never finalized and is not binding. In fact, the Commission specifically disapproved this rulemaking. Furthermore, the novel nature of this reactor's design and its location adjacent to agricultural and residential land and commercial fisheries, as well as a large petrochemical industrial facility, poses a large and complex array of public health and safety risks.

Second, LME relies on other statements from this disapproved draft proposed rule to claim that its allegations of 50% cost coverage through ARDP is a sufficient demonstration of financial capacity.[87] However, as the above analysis in Section 1 of this Contention shows, LME has provided insufficient information to substantiate such a claim, because at best only approximately 21-26% of costs might be covered—though even those will be subject to a denial of reimbursement by DOE, leaving LME responsible for the non-covered costs.

Indeed, requiring compliance with 10 C.F.R. § 50.33(f) and 10 C.F.R. Part 50, Appendix C is the only way to make sure its underlying purpose—protection of public health and safety by preventing safety lapses during construction from underfunded projects—is achieved.

[86] LM-CPA Part V-XV (pdf p. 16).
[87] LM-CPA Part V-XV (pdf p. 16).

b) No special circumstances warrant an exemption.

LME argues that two special circumstances exist that would justify its exemption request, appealing to 10 C.F.R. § 50.12(2)(ii) and (vi),[88] but such relief is not warranted.

Specifically, LME's exemption request rests upon two arguments: a claim of precedent from a previous NRC licensing proceeding (which has limited relevance to the LM-CPA), and documents issued nearly a decade ago to support a proposed rule change to 10 C.F.R. § 50.33 that NRC has never adopted.

i. LME misrepresents the previous NRC licensing process that it seeks to rely on in support of its exemption request, and moreover it has limited relevance here.

LME incorrectly claims that an exemption to 50.33(f) that NRC granted to the applicant for a combined operating license ("COL") for South Texas Project ("STP") Units 3 and 4 in 2015 establishes a relevant precedent for its request for a similar exemption in the LM-CPA, which the NRC found constituted a special circumstance under 50.12(a)(2)(vi). A review of the 2015 safety evaluation report ("SER") that NRC issued for the STP COL application reveals that the applicant (NINA) both (1) provided much more detailed information regarding its sources of funding and corporate relationships than LME has included in the LM-CPA, and (2) proposed a set of conditions to be included in the COL to provide additional assurance of its financial qualifications, which LME has not proposed.

[88] LM-CPA Part V at 17-18.

For example, as detailed in the SER, NINA's FCP included much more detail about:

- its corporate affiliates' capacity and experience in financing nuclear reactor construction projects; (in contrast, LME and TDCC have no such experience)
- the involvement of an established financial consultant with relevant experience in utility infrastructure projects (Deloitte); (in contrast, LME has not disclosed hiring such an established financial consultant)
- the sources of financing for the project, including a negotiated term sheet with the DOE Office of Loan Programs; (which LME does not have) and,
- its parent affiliates' relationships with Japan Bank for International Cooperation ("JBIC") and Nippon Export and Insurance ("NEXI") for project finance and insurance, including letters of support for the STP 3&4 project from JBIC and NEXI. (in contrast, LME has provided no such letters or contracts establishing financial insurance or support).[89]

LME also does not propose analogous licensing conditions to those placed on the STP COL, nor does the LM-CPA include discussion of the NRC's rationale in approving the STP COL. Pertinently, the conditions required that NINA provide NRC notice 60 days before initiating construction, with the following documentation:[90]

> an updated cost estimate; documentation justifying any material variances from the original cost estimate in the COL application; and documentation demonstrating that NINA has secured financing to fund the updated cost estimate.

NRC found such a condition necessary, even in light of the extensive documentation provided by NINA, stating: "the license condition proposed by NINA and as revised by

[89] U.S. Nuclear Regulatory Commission, "Final Safety Evaluation Report (FSER) for the South Texas Project (STP), Units 3 and 4, Combined License Application," September 29, 2015, FSER Chapter 1 (ML15271A126).
[90] *Id.* at 1-39 – 1-40.

NRC staff, ensures that adequate construction funds will be available to NINA before it begins reactor construction of STP Units 3 and 4."[91]

The SER also discussed NRC's rationale for amending NINA's proposed condition and required NINA to not only "identify" material variances from the original cost estimate, but to "justify" them:

> Staff believes that justification of identified variances in the construction cost estimate provides additional supporting confirmation of the applicant's understanding of the costs and funding needs of the project, including changes in cost and financing requirements. The condition that the licensee not only identify variances, but also justify and explain them, provides further evidence of NINA's financial capacity, and ensures that any material cost variances are well understood and justified by the applicant prior to construction.[92]

LME proposes no such conditions to satisfy the financial qualifications standard it proposes, which were deemed essential by NRC in approving the referenced exemption in the STP COL.

As such, LME's failure to provide the same level of documentation as NINA and LME's omission of any similar conditions falls short of the standard NRC relied upon in approving an exemption from 50.33(f) in the STP COL; therefore, LME's reliance on the STP COL as precedent for its request fails to meet that standard.

ii. LME's reliance on a disapproved draft proposed rule is unavailing.

LME cites a 2016 regulatory basis document for a then-proposed change to the 10 C.F.R. § 50.33 financial qualifications requirements. NRC began developing this proposed rule change while the STP COL was under review, to address the circumstances non-utility

[91] *Id.* at 1-40.
[92] *Id.* at 1-39.

applicants may face in securing financing for reactor construction projects. Namely, those include the applicants' reliance on project financing and lenders' requirements that the borrower secure all required permits and approvals before a loan can be approved.

But LME describes no such obstacles in its FCP, stating merely that "An intercompany agreement is in place ensuring TDCC will provide financial support to LME for construction of LMGS" and "The ARDP provides a 50 percent DOE/private sector cost share on all projected costs to deliver LMGS." As detailed above, the latter statement omits significant details that undermine its value in demonstrating financial qualifications. The former statement is not substantiated by supporting documentation demonstrating the terms under which TDCC will provide adequate financial support to LME.

Further, LME admits that, after reviewing the proposed changes to 50.33(f):

> the Commission ***disapproved*** the proposed rule that would have amended these requirements and directed the staff to address financial qualifications during the development of 10 CFR 53.[93]

LME is aware that the NRC has not adopted any final rule amending the financial qualifications requirements, but obliquely characterizes them as "in a pendent state as it is being addressed as part of the ongoing 10 CFR 53 rulemaking effort per Commission direction."[94] In fact, not only did the Commission disapprove of the proposed rule change, the Staff Requirements Memorandum to which the LM-CPA cites indicates a great degree

[93] U.S. Nuclear Regulatory Commission, "Staff Requirements – SECY-18-0026 – Proposed Rule: Financial Qualifications Requirements for Reactor Licensing (RIN 3150-AJ43)," July 14, 2022 (ML22195A097) (emphasis added).
[94] LM-CPA Part V-XVII at 18.

of uncertainty regarding NRC's intentions, soliciting responses to questions that suggest a potential reevaluation of the rationale for amending 50.33(f), including:

> "Does this standard continue to pose challenges for merchant power plant applicants?"; and "Should Parts 50 and 52 have the same financial qualification requirements as Part 53? Why or why not?"[95]

In short, ten years after NRC authorized an exemption from 10 C.F.R. § 50.33(f) in the STP COL case, NRC disapproved an amendment to the rule in question, and it is not evident that one remains pending.

iii. As such, a special condition under (ii) does not exist.

10 C.F.R. § 50.12(ii) states that a special circumstance exists when:

> (ii) Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule;

As LME describes it, "The underlying purpose of the financial qualification requirements for construction in 10 CFR 50.33(f) and 10 CFR 50, Appendix C, is to protect public health and safety by preventing safety lapses during construction from underfunded projects."[96] This is exactly such a project that appears to be underfunded: LME's rationale rests on the premise that ARDP funding will cover 50% of its costs, but as Section I of this Contention shows, this is misleading and inaccurate, with ARDP funding more accurately at most 21%-26%. To the extent LME might rely on the disapproved draft proposed rule or the decision in STP,[97] these grounds are also unconvincing, as the above explains.

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[95] U.S. Nuclear Regulatory Commission, "Staff Requirements – SECY-18-0026 – Proposed Rule: Financial Qualifications Requirements for Reactor Licensing (RIN 3150-AJ43)," July 14, 2022 (ML22195A097).
[96] LM-CPA Part V-XVII at 18.
[97] LME's rationale for exemption (ii) only cites to its ARDP funding.

iv. A special condition under (vi) does not exist.

10 C.F.R. § 50.12(vi) states that a special circumstance exists when:

> There is present any other material circumstance not considered when the regulation was adopted for which it would be in the public interest to grant an exemption. If such condition is relied on exclusively for satisfying paragraph (a)(2) of this section, the exemption may not be granted until the Executive Director for Operations has consulted with the Commission.

LME's rationale with respect to (vi) is also unavailing. LME cites a regulatory basis analysis issued in support of a proposed rule change to 50.33(f) and to the exemption granted in the STP COL. But as described above, the LM-CPA does not provide a similar level of detail or assurances to those NRC relied upon in approving the STP COL.

Therefore, LME has not demonstrated that an exemption is justified and that it meets any of the special circumstances required by 10 C.F.R. § 50.12(a)(2).

3. Even assuming for purposes of argument that an exemption is justified, LME Fails to Demonstrate Its Financial Qualifications under 10 C.F.R. § 70.23(a)(5).

Even assuming that an exemption is justified (which it is not), LME fails to demonstrate its financial qualifications under even the more lenient standard of 10 C.F.R. § 70.23(a)(5). This rule prohibits NRC from issuing a license unless "the applicant appears to be financially qualified to engage in the proposed activities."

The information provided in the LM-CPA is insufficient to meet even this subjective standard. As detailed above in Section 1 of this Contention, based on the LM-CPA's assertions and publicly available information, the ARDP award that LME relies on will not suffice to cover 50% of construction costs, but it will only likely cover at most 21%-26% of presently projected costs. Furthermore, the inaccurate characterization of the ARDP

award and the failure to disclose the interaction of the two ARDP-funded X-Energy projects (the LMGS and TRISO-X construction projects) with respect to that award raise additional questions about the reliability of LME's financial qualifications and its Financial Capacity Plan.

In addition, the LM-CPA's omission of documents that could substantiate the commitments of LME's parent company and the managerial and financing relationships between LME and TDCC further obscures the sufficiency of LME's statements. Even without the language of the agreements between LME, TDCC, and DOE, the information provided in Part I of the LM-CPA does not support the conclusion that there is reasonable assurance that adequate funds will be available. Moreover, as detailed in Section I, neither company has experience in constructing, operating, or financing nuclear reactors and cannot rely on past experience in the industry.

And even when NRC has applied 10 C.F.R. § 70.23(a)(5) and found an applicant financially qualified, it has done so by incorporating the commitments made by the applicant into licensing conditions. In contrast, here, LME has not proposed any license conditions to ensure its financial qualifications are adequately established. To be sufficient, the conditions must be detailed and straightforward to apply, requiring ministerial review only. Conditions that require resolution of legal or factual questions are inappropriate.

For example in *Private Fuel Storage ("PFS")*, the applicant was a limited liability company formed by eight members, all of which were nuclear power generating utilities.[98]

[98] Private Fuel Storage, L.L.C. (Independent Spent Fuel Storage Installation), CLI-00-13, 52 N.R.C. 23, 26 (2000).

It sought a nonreactor license and the NRC found that Part 50 financial requirements did not apply.[99] However, the Commission held that a license applicant's additional commitments should be expressly incorporated into the license to eliminate any question about what the commitments are and about whether they are enforceable.[100]

Likewise, in *Louisiana Energy Services ("LES")*, even though the NRC found the applicant to have sufficiently demonstrated its financial qualifications, it required that license conditions be included to incorporate commitments made in the pleading and in front of the NRC.[101] In deciding to review the application under the more lenient standard of "appears to be financially qualified," it relied on the fact that the application was for uranium enrichment, which have less health and safety risks than nuclear reactors.[102]

Here, LME has proposed no licensing conditions that would incorporate its reliance on TDCC's financial support or otherwise commit to making up for costs not covered by the ARDP grant. Furthermore, neither TDCC nor LME have the same experience in nuclear power that PFS's financial backers and member companies did. It is also proposing to build nuclear reactors, unlike the uranium enrichment operations that the Commission found would be inherently more safe in *LES*.

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[99] *Id.* at 30-31.
[100] *Id.* at 32.
[101] Louisiana Energy Services, L.P. (Claiborne Enrichment Center), CLI-97-15, 46 N.R.C. 294, 308 (1997).
[102] *Id.* at 306.

C. This Contention Is Within the Scope of This Proceeding

This contention is within the scope of the LME licensing proceeding because it seeks compliance with the NRC's rules regarding financial qualifications, a necessary element that must be established before a license may be issued.

D. This Contention Is Material to the Findings the NRC Must Make to Grant the LM-CPA

This contention is material to the findings NRC must make to issue this license because it challenges LME's assertion that 10 C.F.R. § 70.23(a)(5) applies, when in fact it has not met the standard for an exemption under 10 C.F.R. § 50.12, and therefore LME should be held to the financial qualification standard in 10 C.F.R. § 50.33(f) and Appendix C to Part 50.

E. Facts or Expert Opinion Supporting the Contention, Along with Appropriate Citations to Supporting Scientific or Factual Materials

The facts supporting Waterkeeper's Contention are stated in the Contention itself, which includes references to the LM-CPA.

CONTENTION 4: The Environmental Report erroneously minimizes the adverse environmental impacts of the proposed LMGS.

A. Statement of Contention

LME asserts that the adverse environmental impacts of building and operating the LGMS will range from MODERATE to none (during construction) and SMALL to none (during operation).[103] But these claims are based on a seriously deficient environmental analysis, which is in turn based on a seriously deficient safety analysis. A detailed list of

[103] ER Table 4.6-1 (construction), Table 5.12-1 (operation); *see also* Table 10.2-1.

the deficiencies in LME's environmental analysis is provided in the basis statement below. If these issues are evaluated adequately, the proposed action is likely to have reasonably foreseeable and significant adverse effects on the quality of the human environment.

B. Basis

As a major federal action, LME's proposed facility must undergo a NEPA review, which must assess the direct, indirect, and cumulative effects of the proposed action. When such a proposed action will have a reasonably foreseeable significant effect on the quality of the human environment an environmental impact statement is required. 42 U.S.C. § 4336(b)(1).[104] Here, there is a reasonably foreseeable and potentially significant effect on the quality of the human environment at least due to the risk of accidents. As drafted, the PSAR and ER obscure the actual risk of accidents because of erroneous assumptions and omissions in these documents, including the failure to adequately address climate change impacts. The ER is also deficient because it treats seismic risks as not credible with insufficient explanation to support this determination. In sum, the ER and PSAR do not provide sufficient information and analyses to support LME's conclusions as to the magnitude of impacts.

[104] 10 C.F.R. § 51.20(b)(1) also independently requires that an EIS be prepared for an application to construct a nuclear reactor, which the LM-CPA seeks here. LME would need to be granted an exemption from 10 C.F.R. § 51.20(b) to avoid violating this requirement and proceed with an EA. In its transmittal letter, LME suggested that it be exempt from this requirement, and the NRC appears to intend to proceed first with an EA. *See* Long Mott Transmittal Letter (Mar. 31, 2025) (ML25090A058) at 4; Long Mott Generating Station Construction Permit Application Review Schedule and Resource Estimate (June 10, 2025) (ML25155B841) (Environmental Review Milestones: Environmental Assessment Issuance and Finding of No Significant Impact (FONSI); Estimated Completion: June 2026)). However, even if LME is found to be exempt from 51.20(b), an EIS would still be required because reasonably foreseeable significant impacts would be expected.

The Declarations from Dr. Lyman and Mr. Mitman set forth in detail flaws in the PSAR and ER:

As Dr. Lyman explains, the LM-CPA's proposed functional containment fails to satisfy the minimum criteria for adequacy as required by the applicable regulations, including those in 10 C.F.R. § 50.34.[105] This is due to the fact that:

- No manufacturing defect data is presented that would justify the assumptions made in the LM-CPA;[106]
- The assumptions underlying depressurized loss of forced circulation ("DLOFCs") are invalid;[107]
- The methodology for calculating the core radionuclide inventory is unreliable;[108]
- Other deficiencies exist that render the mechanistic source terms inadequate and unreliable;[109] and,
- The LM-CPA does not address the limitations regarding the Fuel Qualification Topical Report.[110]

As such, Dr. Lyman concludes that the LM-CPA does not demonstrate that the proposed Xe-100 functional containment will provide adequate protection of public health and safety.[111]

Furthermore, Dr. Lyman points out that an additional defect exists related to the functional containment evaluation, as the LM-CPA does not include beyond-design basis events (BDBEs) in the spectrum of accidents considered in the functional containment evaluation.[112]

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[105] Exhibit E, ¶¶ 6-13, 37-38.
[106] *Id.*, ¶¶ 16-18.
[107] *Id.*, ¶¶ 19-23.
[108] *Id.*, ¶¶ 24-30.
[109] *Id.*, ¶¶ 31-34.
[110] *Id.*, ¶¶ 35-37.
[111] *Id.*, ¶ 38.
[112] *Id.*, ¶¶ 39-44.

Mr. Mitman describes further flaws in the PSAR that demonstrate there is insufficient support for LME's conclusions. As he explains and as is detailed in his Declaration:

- The PSAR is flawed because with the exception of a single input into the hurricane analysis (sea level rise), the PSAR contains no discussion of the effects of climate change on the safety of the proposed LMGS, even though it is reasonably foreseeable that the LMGS site would be vulnerable to impacts from climate change, including flooding and hurricanes;[113]

- The PSAR's conclusion as to maximum flood elevations of nearby waterbodies is based on only historic data and incomplete analyses, with no consideration of climate change;[114]

- The application indicates that safety structures were consolidated and moved, and that analyses in the PSAR are thus based on outdated information;[115]

- It appears that even the historical data that is provided by the PSAR is inadequate (or even inapplicable) to suffice for a climate change analysis with respect to flooding. Indeed, LME admits that "[a]dditional site-specific analyses and associated information that includes the postulated coincidental wind setup and wave setup" is still lacking from the ER. Furthermore, the methodologies used to calculate probable maximum precipitation ("PMP") and local intense precipitation ("LIP")—inputs into accident risk analyses—do not consider very recent intense storms that could affect the models;[116]

- The PSAR's dam failure analysis fails to consider the reasonably foreseeable adverse effects of climate change;[117]

- The PSAR's assumptions on operating basin failure possibilities are unjustified;[118]

[113] Exhibit F, ¶¶ 8-15.
[114] *Id.*, ¶¶ 16-18.
[115] *Id.*, ¶ 19.
[116] *Id.*, ¶¶ 20-21.
[117] *Id.*, ¶¶ 22-24.
[118] *Id.*, ¶¶ 23-24.

- LME's probable maximum surge predictions rely on a questionable assumption for sea level rise and otherwise do not consider the reasonably foreseeable impacts from climate change;[119]

- LME does not appear to indicate how it plans to protect the safety-related SSCs from surge and seiche flooding;[120] and,

- LME omits the analysis of a reasonably foreseeable accident hazard: a climate-change exacerbated storm event that could cause uncontemplated safety impacts and risks to the LMGS and the surrounding environment.[121]

These flaws propagate into the Environmental Report because it relies on the analysis conducted in the PSAR and does not remediate the aforementioned issues, nor address climate change's risks to the facility and subsequently the surrounding environment.[122] The ER is further flawed, as Mr. Mitman points out, because it treats seismic risk as not credible, without sufficient explanation to support this determination.[123] And the LM-CPA's assertion that the total calculated dose risk is less than other reactors studied in the literature is misleading because the LM-CPA does not analyze the external event scenarios.[124] Taken together, the deficiencies show that the PSAR and ER are inadequate.[125]

In other words, Dr. Lyman's Declaration shows multiple fundamental flaws in LME's conclusion that the functional containment system will be adequate. Mr. Mitman also describes additional flaws in the PSAR data and analyses. Yet the PSAR incorporates

[119] *Id.,* ¶¶ 25-27.
[120] *Id.,* ¶ 28.
[121] *Id.,* ¶¶ 29-32.
[122] *Id.*, ¶ 33.
[123] *Id.*, ¶¶ 34-36.
[124] *Id.*, ¶ 37.
[125] *Id.*, ¶¶ 38-39.

all of these flawed assumptions when assessing the risks to the facility from the natural phenomenon threats that Mr. Mitman's Declaration describes. And when assessing these risks, LME both ignores relevant historical data and fails to take into account how climate change exacerbates risk for the plant and the human environment around it.

Furthermore, Mr. Mitman identifies a specific accident risk, i.e., climate-change exacerbated dam failure that could send an excess of water into the LMGS site. Yet the Environmental Report gives no signs of incorporating these sorts of reasonably foreseeable environmental impacts from climate change on the facility that would increase the risk to the plant and the human environment around it.

LME's discussion regarding storage of spent nuclear fuel also fails to comply with applicable regulations—which further undermines LME's conclusions regarding safety, and creates a risk of reasonably foreseeable environmental impacts, which must be evaluated. LME's Environmental Report, discussing continued at-reactor storage of spent nuclear fuel, references and relies on NUREG-2157 and 10 C.F.R. § 51.23 for purposes of demonstrating compliance with the required assessment of the impacts of continued storage beyond the licensed lifetime of the reactor.[126] However, 10 C.F.R. § 51.23 and NUREG-2157 (General Environmental Impact Statement for Continue Storage of Spent Nuclear Fuel) apply only to light-water reactors, not non-light-water reactors, such as the one proposed here.[127] Thus, LME was required to conduct an assessment of the impacts of

[126] LM-CPA Environmental Report, p. 5.7-13 (pdf p. 799).

[127] The NRC has proposed a rule adopting a Generic Environmental Impact Statement for advanced, or non-light-water reactors, which if and when adopted, would allow non-light water reactors to rely on NUREG-215 and 10 C.F.R. § 51.23—with the condition that the spent fuel "is

continued storage of spent nuclear fuel beyond the licensed lifetime of the reactor. Alternatively, LME was required to seek an exemption from this requirement, which it did not do.

Not only are these material flaws in their own right, a NEPA violation is threatened when these errors are incorporated into the Environmental Report without being addressed because the NEPA analysis will be built off of the information in the ER. And even where the NRC purports to have resolved safety issues through its Atomic Energy Act-based regulatory process, it must nevertheless comply with NEPA's procedural obligations for addressing those issues in its decision-making processes.[128]

Specifically, NEPA requires consideration of "reasonably foreseeable environmental effects of [a] proposed agency action."[129] Reasonably foreseeable environmental impacts include the effects of climate change.[130] An agency may avoid discussing an environmental risk only if the probability of an environmental effect is "so

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stored in a manner that meets the regulatory requirements for spent fuel storage cask approval and fabrication in accordance waste casks that comply with 10 C.F.R. Part 72 (TN4884), Subpart L – "Approval of Spent Fuel Storage Casks." NUREG-2249, Generic Environmental Impact Statement for Licensing of New Nuclear Reactors, Draft Report for Comment (Sept. 2024), (ML24176A220), p. 1-7. But this rule has not yet been finalized or adopted. And so, it does not yet apply here.

[128] *Limerick Ecology Action*, 869 F.2d 719, 729-31 (3d Cir. 1989). *See also State of New York v. NRC*, 681 F.3d 471, 478 (D.C. Cir. 2012) ("a finding that 'reasonable assurance exists that sufficient mined geologic repository capacity will be available when necessary' . . . does not describe a probability of failure so low as to dismiss the potential consequences of such a failure.").

[129] 42 U.S.C. § 4332(C)(i) (2023). *See also New York*, 681 F.3d at 476 (quoting 40 C.F.R. §§ 1508.8, 1508.18; *Dep't of Transp. v. Public Citizen*, 541 U.S. 752, 763 (2004) ("major federal actions" include "actions with '[i]ndirect effects, which are caused by the action and are later in time or farther removed in distance, but are reasonably foreseeable'")).

[130] *N.J. Conservation Found. v. FERC*, 111 F.4th 42, 54 (D.C. Cir. 2024).

low as to be 'remote and speculative,' or if the combination of probability and harm is sufficiently minimal."[131]

And as drafted, the ER and PSAR do not reflect a complete or adequately rigorous evaluation of all external hazards, do not consider uncertainties, and do not address the reasonably foreseeable effects of climate change on the risks of accidents at the LME facility.

C. This Contention Is Within the Scope of This Proceeding

This Contention is within the scope of the LME licensing proceeding because it seeks compliance by the NRC's environmental review with NEPA and the NRC's implementing regulations. The NRC's NEPA requirements are set forth in 10 C.F.R. Part 51. One of the requirements for a construction license is for the nuclear plant operator to submit an environmental report.[132] The ER typically incorporates the analyses from the PSAR, which is a required part of the application under 10 C.F.R. § 50.34(a). And the ER forms the basis for NRC's NEPA review.[133]

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[131] *New York*, 681 F.3d at 478-79 (*quoting City of New York v. Dep't of Transp.*, 715 F.2d 732, 738 (2d Cir. 1983*)). See also Standing Rock Sioux Tribe v. U.S. Army Corps. of Engineers*, 985 F.3d 1032, 1050 (D.C. Cir. 2021) (*quoting Sierra Club v. FERC*, 827 F.3d 36, 47 (D.C. Cir. 2016) (even where an environmental risk "may be low," NEPA requires consideration if "the risk is sufficient 'that a person of ordinary prudence would take it into account in reaching a decision.'")).
[132] 10 C.F.R. § 51.45(b).
[133] 10 C.F.R. § 51.45.

In addition, agencies must comply with NEPA "to the fullest extent, unless there is a clear conflict of statutory authority."[134] Defendants may not rely on the NRC's Atomic Energy Act-based safety review to preclude or avoid NEPA compliance.[135]

D. This Contention Is Material to the Findings the NRC Must Make to Grant the LM-CPA

This Contention argues that precursor analyses to ensure NEPA compliance are omitted from the application materials, namely from the PSAR and ER. These omissions are material because, had such evaluations been included in these reports and in any subsequent environmental document (EA or EIS), they reasonably could affect the NRC's proposed findings as to the magnitude of environmental impacts the LME facility will cause. Without addressing these flaws and omissions, it is likely that the resulting NEPA document will lack a reasonable basis for its conclusions. Moreover, the public-participation benefits of an EIS review will have been forfeited because an EA does not include the same level of outreach to the public and governments, including scoping.

E. Facts or Expert Opinion Supporting the Contention, Along with Appropriate Citations to Supporting Scientific or Factual Materials

The facts supporting Waterkeeper's Contention are stated in the Contention itself, in Dr. Lyman and Mr. Mitman's Declarations, and in the supporting materials cited in their Declarations and in the discussion of the "Basis" for this Contention.

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[134] *Calvert Cliffs' Coordinating Comm. v. U.S. Atomic Energy Comm.*, 449 F.2d 1109, 1115 (D.C. Cir. 1971); *see also Limerick Ecology Action v. NRC*, 869 F.2d 719, 729 (3rd Cir. 1989) (Atomic Energy Act does not preclude NEPA compliance).
[135] *Id.* at 729-30.

V. CONCLUSION

For the foregoing reasons, Waterkeeper's Petition to Intervene and Request for Hearing should be granted.

Date: August 11, 2025

Respectfully submitted,

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION

In the Matter of:	§	
	§	**Docket No. 50-614-CP**
Long Mott Energy, LLC	§	
	§	**August 11, 2025**
(Long Mott Generating Station)	§	
	§	

CERTIFICATE OF SERVICE

Pursuant to 10 C.F.R. § 2.305, I hereby certify that, on August 11, 2025, copies of the foregoing "San Antonio Bay Estuarine Waterkeeper's Petition to Intervene and Request for Hearing" were served upon the Electronic Information Exchange (the NRC's E-Filing System), in the above-captioned docket.

Signed (electronically) by Marisa Perales
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