

**UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
Before the Atomic Safety and Licensing Board**

In the Matter of:	)	
	)	Docket No. 70-143-LA
Nuclear Fuel Services, Inc.	)	
	)	October 31, 2022
(License Amendment Application)	)	

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**AMENDED PETITION OF ERWIN CITIZENS AWARENESS NETWORK FOR LEAVE TO  
INTERVENE IN NUCLEAR FUEL SERVICES, INC. LICENSE AMENDMENT  
PROCEEDING, AND REQUEST FOR A HEARING**

Now comes Erwin Citizens Awareness Network, Inc., a Tennessee nonprofit grassroots organization the address of which is P.O. Box 1152, Jonesborough, TN 37659, on behalf of one of its members, and hereby requests leave to intervene and for a public hearing in the matter of the proposed license amendment submitted to the Nuclear Regulatory Commission (“NRC”) by Nuclear Fuel Services, Inc. (“NFS” or “Licensee”) to perform uranium purification and conversion services at NFS’ Erwin, Tennessee plant facility. Notice of the license amendment application appeared at 87 FR 53507 (August 31, 2022).

In support of its Request for Hearing and Petition to Intervene, Erwin Citizens Awareness Network, Inc. further states as follows:

A new production process is planned for the NFS plant in Erwin. “The National Nuclear Security Administration (NNSA) intends to award BWX Technologies subsidiary Nuclear Fuel Services a sole-source contract to purify highly enriched uranium and convert it into metal for nuclear weapons programs.”<sup>1</sup> “BWX Technologies Nuclear Fuel Services, Erwin, Tenn., will begin producing purified uranium metal for nuclear weapons under a sole-source award announced Wednesday by the National Nuclear Security Administration (NNSA).”<sup>2</sup> “Normally,

<sup>1</sup> <https://www.exchangemonitor.com/nnsa-looks-bwxt-subsiary-hedge-heu-shortfall/>

<sup>2</sup> <https://www.defensedaily.com/nuclear-fuel-services-to-start-weapons-uranium-work-under-sole-source>

this work of processing weapons-grade uranium takes place at the Y-12 National Security Complex in Oak Ridge, Tenn., but the NNSA is building a modernized uranium processing facility. The NFS contract to continue this work allows for a steady supply for the Department of Defense, including its stockpile requirements for nuclear weapons material.”<sup>3</sup>

Erwin Citizens Awareness Network, Inc. (“ECAN” or “Petitioner”) is a not-for-profit organization incorporated in Tennessee in 2010, the primary purpose of which is to research and investigate issues involving the nuclear industry that may affect the health, safety and environment of Erwin, Unicoi County, Tennessee as well as other downstream and downwind counties. ECAN seeks to protect surface and ground water quality, air quality, and lands from degradation due to the actions of the nuclear industry in the Erwin area, doing so via public education, advocacy, and monitoring the oversight by the Nuclear Regulatory Commission, the Tennessee Department of Environment and Conservation, the U.S. Environmental Protection Agency, and other governmental agencies. Most of ECAN’s 24 members reside, work and recreate within twenty-five (25) miles of NFS in Erwin, Tennessee.

ECAN herewith provides the declaration of one of its members, Alfred John “Buzz” Davies, who lives, recreates and works within one mile of the Licensee, and who has designated ECAN to intervene in the NFS license amendment proceeding on his behalf to protect his interests in physical health and safety, the health and safety of his family members, his real property, and physical environment proximate to NFS. ECAN provides herewith the declaration of its executive officer, agreeing to intervene on Davies’ behalf and to represent his interests as its member.

## **I. STANDING**

### **A. Legal Basis for Standing**

Pursuant to 10 CFR § 2.309, a request for hearing or petition for leave to intervene

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-nnsa-contract/nuclear-modernization/

<sup>3</sup> “Nuclear Fuel Services to Gain More Jobs,” <https://m.usw.org/news/media-center/articles/2021/nuclear-fuel-services-to-gain-more-jobs>

must address (1) the nature of the petitioner's right under the Atomic Energy Act to be made a party to the proceeding, (2) the nature and extent of the petitioner's property, financial, or other interest in the proceeding, and (3) the possible effect of any order that may be entered in the proceeding on the petitioner's interest.

In determining whether a petitioner has sufficient interest to intervene in a proceeding, the Commission has traditionally applied judicial concepts of standing. See *Metropolitan Edison Co.* (Three Mile Island Nuclear station, Unit 1), CLI-83-25, 18 NRC 327, 332 (1983) (citing *Portland General Electric Co.* (Pebble Springs Nuclear Plant, Units 1 and 2), CLI-76-27, 4 NRC 610 (1976)). Contemporaneous judicial standards for standing require a petitioner to demonstrate that (1) he or it has suffered or will suffer a distinct and palpable harm that constitutes injury-in-fact within the zone of interests arguably protected by the governing statutes (e.g., the Atomic Energy Act of 1954 (AEA) and the National Environmental Policy Act of 1969 (NEPA)); (2) the injury can be fairly traced to the challenged action; and (3) the injury is likely to be redressed by a favorable decision. See *Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plants), LBP-99-25, 50 NRC 25, 29 (1999). The notion of "injury-in-fact" includes even radiation impacts that do not necessarily amount to a regulatory violation. See *Duke Cogema Stone & Webster* (Savannah River Mixed Oxide Fuel Fabrication Facility), LBP-01-35, 54 NRC 403, 417 (2001) (citing *Yankee Atomic Electric Co.* (Yankee Nuclear Power Station), CLI-96-7, 43 NRC 235, 247-48 (1996)). Even a minor exposure to radiation--within regulatory limits--will suffice to state an injury-in-fact. *Id.*

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. See *Hydro Resources, Inc.* (2929 Coors Road, Suite 101, Albuquerque, NM 87120), LBP-98-9, 47 NRC 261, 271 (1998). 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 (preferably by affidavit) that the organization is authorized to request a hearing on behalf of that member. See, e.g., *Georgia Institute of Technology* (Georgia Tech Research Reactor, Atlanta, Georgia), CLI-95-12, 42 NRC 111, 115 (1995); *Houston Lighting and Power Co.* (South Texas Project, Units 1 and 2), ALAB-549, 9 NRC 644, 646-48 (1979); *Houston Lighting and Power Co.* (Allens Creek Nuclear Generating Station, Unit 1), ALAB-535, 9 NRC 377, 390-97 (1979). Regarding the preference for an affidavit, see *Shieldalloy Metallurgical Corp.* (Cambridge, Ohio Facility), CLI-99-12, 49 NRC 347, 354 & n.4 (1999); *Northeast Nuclear Energy Co.* (Millstone Nuclear Power Station, Unit 1), LBP-96-1, 43 NRC 19, 23 (1996).

#### **B. ECAN Member Davies Demonstrates Traditional And Proximity Standing**

Standing to participate in this proceeding is shown by the enumerated facts of traditional standing plus evidence of “proximity plus” standing in the declaration of ECAN’s individual member, Buzz Davies, annexed to this Petition.

The “proximity-plus” test for standing requires a showing that the uranium purification and conversion activities at issue involve geographical closeness to a “significant source of radioactivity producing an obvious potential for offsite consequences.” *Sequoyah Fuels Corp. and General Atomics* (Gore, Oklahoma Site), CLI-94-12, 40 NRC 64, 75 n. 22 (1994). See, also, *Shaw Areva MOX Services*, 66 NRC 169, LBP-07-14 (2007) (petitioners living 20 to 32 miles from mixed oxide fuel fabrication facility have standing because NRC Staff included residents as far away as 50 miles from the facility in its calculation of potential population doses). A showing of proximity to a source of dangerously radioactive materials excuses the burden of articulating a plausible means through which those materials could cause harm; the inherent dangers of the radioactive materials comprise the obvious potential for offsite consequences. *U.S. Army Installation Command* (Schofield Barracks, Oahu, Hawaii, and Pohakuloa Training Area, Island

of Hawaii, Hawaii), CLI-10-20, 71 NRC 216, 218 (2010), citing *USEC, Inc.* (American Centrifuge Plant), CLI-05-11, 61 NRC 309, 311 (2005). “[T]he emission of non-natural radiation into appellees’ environment would also seem a direct and present injury, given our generalized concern about exposure to radiation and the apprehension flowing from the uncertainty about the health and genetic consequences of even small emissions like those concededly emitted by nuclear power plants.” *Duke Power Co. v. Carolina Environmental Study Group*, 438 U.S. 59, 74 (1978). “A threatened unwanted exposure to radiation, even a minor one, is sufficient to establish an injury.” *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Unit 2), CLI-03-14, 58 NRC 207, 216 (2003).

Buzz Davies lives within one mile of the NFS plant complex in Erwin, Tennessee. Davies Declaration (Dec.) para. 2. He is a retired nuclear quality control engineer for a federal radiological materials contractor and possesses technical understanding of the processes and proposed purification and conversion of high enriched uranium (HEU) at the NFS facility. Davies Dec. para. 4. He perceives a significant risk of criticality (*i.e.*, uncontrolled nuclear chain reaction accidents) at NFS, with possible serious physical harm to workers and the public. Mr. Davies is knowledgeable of a history of uranium hexafluoride (UF<sub>6</sub>) accidents at the NFS facility which have caused offsite radiological effects to surrounding land. He also is familiar with the past findings of Dr. Michael Ketterer, a retired chemistry professor, who has documented the presence of radionuclides originating from NFS into the Nolichucky River adjacent to NFS and that those isotopes are flowing many miles downstream from NFS. Davies reasonably believes that there will be continued or expanded potential for more such radiological accidents and spills from new operations that process purer, more volatile, HEU.

Buzz Davies points out that normal operations at NFS in Erwin are inherently dangerous to public health and the environment. As long as he has lived in Erwin, he has been concerned for his personal safety, and that of others who live in his household, from radiation exposure in the event of a serious accident, vandalism or a terrorist attack involving radioactive material-

handling activities at the plant. He worries that those in his household and he might suffer health consequences and incur serious property damage.

Buzz Davies disagrees with NFS' conclusion in its November 2021 Supplemental Environmental Report (Supplemental ER) that adding the new purification and conversion process will result in no additional public health and environmental threat to him and the Erwin community. Removing radionuclide impurities from HEU, he asserts, will require chemical processes that pose radioactive materials handling dangers above and beyond the present ones at NFS.

As one who has tracked activities at the NFS facility in Erwin for years, Buzz Davies maintains that NFS has produced materials for use in United States nuclear weapons production program efforts, and suspects that the purified HEU generated by the proposed line also would be incorporated into nuclear weapons. He states that nuclear weapons are governed by U.S. commitments to international treaties and that the National Environmental Policy Act (NEPA) document to be written by the NRC for the proposed license amendment must include a nuclear weapons proliferation impact assessment to meet NEPA disclosure requirements.

Mr. Davies further is concerned that the NRC has continued to interpret the Atomic Energy Act and its regulations such that NFS is exempt from implementing a formal 10 CFR Part 50 Appendix B Nuclear Quality Assurance Program. He sees no formal quality assurance organization in the plant's management structure and no head of Quality that reports to the President of NFS, or who has stop-work authority.

Davies via his declaration designated ECAN, of which he is a member, to represent his interests via a petition to intervene before the NRC in this license amendment proceeding.

### **C. Davies Has Demonstrated Individual Standing And ECAN May Proceed To Assert Representational Standing**

Davies has shown an injury-in-fact, to-wit, “‘a concrete and particularized harm’ that is ‘actual or imminent.’” Causation of the harms he describes are traceable to present and

prospective industrial processing of uranium at NFS. And redressability, in the form of identification and mitigation of the harms by the NRC, is available. He has satisfied the classic standing factors. Adding to this showing Mr. Davies' physical proximity as a close neighbor to a "significant source of radioactivity producing an obvious potential for offsite consequences" – the requirement of *Sequoyah Fuels Corp. and General Atomics, supra* – it is evident that Mr. Davies has properly demonstrated individual standing.

It follows that Mr. Davies' individual standing allows ECAN to proceed on his behalf to intervene in this matter. ECAN's standing derives from showing (1) Mr. Davies has standing to intervene in his own right; (2) the interests ECAN seeks to protect are germane to its organizational purpose; and (3) neither the claim asserted nor the relief requested requires that Mr. Davies participate in the lawsuit. *Sierra Club v. EPA*, 292 F.3d 895, 898 (D.C. Cir. 2002).

## II. CONTENTIONS

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 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; (6) provide sufficient information to show that a genuine dispute exists with the licensee on a material issue of law or fact.

The burden on a petitioner in asserting contentions is not heavy. *Dominion Nuclear Conn., Inc.* (Millstone Nuclear Power Station, Units 2 & 3), CLI-01-24, 54 NRC 349, 359 (contention admissibility standards "insist upon some 'reasonably specific factual and legal

basis' for the contention." Petitioners are required only to "articulate at the outset the specific issues they wish to litigate." *Id.* at 359.

## **CONTENTION A: NUCLEAR WEAPONS PROLIFERATION REVIEW IS REQUIRED BY NEPA AND AEA**

### **1. Proposed Contention**

The new process at NFS will provide purified HEU material for inclusion in nuclear weapons. It is an activity that signals to the international community continued U.S. government support for a policy of producing nuclear weapons for warmaking. The policy projects a message internationally that inclusion of continuously-improved nuclear weapons in international relations is acceptable. That policy is increasingly at odds with international laws and norms. Under NEPA, the NRC is required to investigate, analyze and publicly disclose a nuclear weapons proliferation assessment, discussing the impacts and policy implications of the new NFS purification process on the U.S. weapons program and prospects.

### **2. Basis For The Contention**

A new Uranium purification process is planned for the NFS plant in Erwin. "The National Nuclear Security Administration (NNSA) intends to award BWX Technologies subsidiary Nuclear Fuel Services a sole-source contract to purify highly enriched uranium and convert it into metal for nuclear weapons programs."<sup>4</sup> "BWX Technologies Nuclear Fuel Services, Erwin, Tenn., will begin producing purified uranium metal for nuclear weapons under a sole-source award announced Wednesday by the National Nuclear Security Administration (NNSA)."<sup>5</sup> "The NFS contract to continue this work allows for a steady supply for the Department of Defense, including its stockpile requirements for nuclear weapons material."<sup>6</sup>

This expansion of HEU purification capacity at NFS is happening against the backdrop of The Russo-Ukrainian war and related to it, a re-ignited arms race among the United States, Russian Federation, and China. Several times so far in 2022, leaders of the Russian Federation

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<sup>4</sup> <https://www.exchangemonitor.com/nnsa-looks-bwxt-subsiary-hedge-heu-shortfall/>

<sup>5</sup> <https://www.defensedaily.com/nuclear-fuel-services-to-start-weapons-uranium-work-under-sole-source-nnsa-contract/nuclear-modernization/>

<sup>6</sup> <https://m.usw.org/news/media-center/articles/2021/nuclear-fuel-services-to-gain-more-jobs>

and the United States have broadly hinted at the possibility that under certain circumstances, nuclear warfare could take place in Europe.

Some in the US defense establishment are promoting the perception that a nuclear war can be fought and won, and are doing so in a voice that is influential, respected, well-funded, and treated with deference. The U.S. defense sector leadership is messaging its workforce so that this huge constituency conveys a view of nuclear weapons policies that intensifies the new nuclear arms race. Beyond the saber-rattling between the United States and Russia, China is accelerating its development of strategic nuclear warheads to amass 700 by 2027 and 1,000 by 2030.<sup>7</sup>

The 23-chapter Guide to Nuclear Deterrence in the Age of Great Power Competition,<sup>8</sup> published recently by the Louisiana Tech Research Institute, a support body for the US Air Force Global Strike Command, was written by nuclear arms complex experts and exemplifies the new thermonuclear hubris. These experts postulate that “US strategic nuclear forces might be expected to perform the following functions... endurance throughout the various phases of a protracted (and presumably limited) nuclear war... or establish escalation dominance and nuclear-strategic superiority over any prospective opponent.”<sup>9</sup> Nuclear war, they say, is very thinkable.

The Bulletin of the Atomic Scientists points out that the Guide:

. . . [C]enters around a new reality—the aggressive development of nuclear arms by Russia and China that is intensifying a new Cold War. Nuclear arms treaties—an important tool for limiting arms races—are brushed aside as functionally pointless since, according to the guide, Russia will cheat and China won’t come to the bargaining table. In one passage, the guide claims “it is unlikely that these countries would be foolish enough to engage in a strategic arms race with the United States, and, if they do, they will lose.” Yet much of the remainder of the document analyzes all the ways in which China and Russia are advancing their capabilities beyond US capabilities. These threatening developments are then used to justify the rapid and expensive modernization of the US nuclear weapon complex, while many historic nuclear arms

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<sup>7</sup> <https://www.armscontrol.org/act/2021-12/news/pentagon-sees-faster-chinese-nuclear-expansion>

<sup>8</sup> <https://atloa.org/wp-content/uploads/2020/12/Guide-to-Nuclear-Deterrence-in-the-Age-of-Great-Power-Competition-Lowther.pdf>

<sup>9</sup> *Id.* at 386.

agreements wither away, including the Anti-Ballistic Missile Treaty, Intermediate-range Nuclear Forces Treaty, and the Iran nuclear deal.<sup>10</sup>

At least two treaties call into question the expansion of HEU purification at NFS. The Nuclear Nonproliferation Treaty (NPT), which entered into force in 1970 and was extended indefinitely in 1995, is the centerpiece of the nuclear nonproliferation regime. The treaty currently has 191 states-parties. It is complemented by International Atomic Energy Agency (IAEA) safeguards, national export control laws, coordinated export control policies under the Nuclear Suppliers Group, U.N. Security Council resolutions, and *ad hoc* initiatives. The NPT prohibits non-nuclear weapon states (NNWS) parties from acquiring nuclear weapons; prohibits the five nuclear weapon states (NWS - China, France, U.S., Russia and Britain) from transferring nuclear weapons to NNWS or assisting such states with the manufacture or other acquisition of nuclear weapons. The NWS agree to “pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament.”<sup>11</sup> This mandate was redoubled by the 1996 Advisory Opinion of the International Court of Justice, which enjoined the 182 NPT signatories that NPT’s Article VI requirement to negotiate nuclear disarmament in good faith “goes beyond that of a mere obligation of conduct; the obligation involved here is an obligation to achieve a precise result, nuclear disarmament in all its aspects by adopting a particular course of conduct, namely, the pursuit of negotiations on the matter in good faith.”<sup>12</sup>

Another international agreement has major ramifications for the legality of the NFS HEU purification project: the Treaty on the Prohibition of Nuclear Weapons (TPNW). At least 86 countries have signed and 60 countries have ratified the TPNW, also known as the nuclear “ban treaty.” It entered into force 90 days following the 50th state’s ratification on January 22, 2021.

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<sup>10</sup> <https://thebulletin.org/2022/02/us-defense-to-its-workforce-nuclear-war-can-be-won/>

<sup>11</sup> NPT, Article VI, <https://www.un.org/disarmament/wmd/nuclear/npt/text/>

<sup>12</sup> <https://www.law.umich.edu/facultyhome/drwcasebook/Documents/Documents/Advisory%20Opinion.%201996%20I.C.J.%20226.pdf> at p. 32.

United Nations General Assembly Resolution A/71/258 (2016) had called on U.N. member states to negotiate a legally binding prohibition on nuclear weapons. Negotiations were held in 2017 and at the end of the conference, 122 countries voted to approve the treaty. TPNW's Article 1, Sect. 1(a) says that adherents may never “develop, produce, manufacture, otherwise acquire, possess or stockpile nuclear weapons or other nuclear explosive devices.”<sup>13</sup> This includes a prohibition on hosting nuclear weapons that are owned or controlled by another state.<sup>14</sup> Nor may states-parties transfer, receive control over, or assist others in developing nuclear weapons.<sup>15</sup> They may not use or threaten to use nuclear weapons or other nuclear explosive devices.<sup>16</sup> TPNW Article 7 requires states to give assistance to individuals affected by the use or testing of nuclear weapons and provide for environmental remediation.

The Obama and Trump Administrations opposed the ban treaty and, along with 40 other states, did not participate in negotiations. Nonetheless, the TPNW is permanent in nature and is legally binding upon those states that join it.<sup>17</sup>

Thus the continuation, with expensive improvements, upgrades and expansions, of the U.S. nuclear weapons program is quite controversial. It is arguably illegal, violative of international norms, and each step taken to enlarge the nuclear weapons supply chain renews legal, moral, ethical and survival questions. The recurring U.S. signals of the acceptability of maintaining and improving its nuclear arsenal are consequential.

NEPA requires the Nuclear Regulatory Commission to conduct a nuclear weapons proliferation assessment to examine the contribution of purified HEU manufactured at NFS within the overall weapons supply chain. The NRC must identify and analyze under NEPA the particular impacts that purified HEU will have on the capabilities of the U.S. nuclear weapons program in the ongoing 21st century nuclear arms race. While a “better” Environmental Impact

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<sup>13</sup> [https://www.icanw.org/tpnw\\_full\\_text](https://www.icanw.org/tpnw_full_text)

<sup>14</sup> *Id.* at Sect. 1(g).

<sup>15</sup> *Id.* at Sects. 1(b), (c).

<sup>16</sup> *Id.* at Sect. 1(d).

<sup>17</sup> [https://www.icanw.org/the\\_treaty](https://www.icanw.org/the_treaty)

Statement probably won't halt the arms race, it can usefully realize NEPA's twin aims, (1) to foster informed decision making by "ensur[ing] that the agency, in reaching its decision, will have available, and will carefully consider, detailed information concerning significant environmental impacts," and (2) to promote informed public participation by requiring full disclosure of and opportunities for the public to participate in governmental decisions affecting environmental quality. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349-50 (1989).

### **3. The Contention Is Within the Scope Of the Proceeding**

This license amendment proceeding falls within the ambit of the Atomic Energy Act (AEA), 42 U.S.C. §§ 2011-2297; and the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. §§ 4321-4347. The requirement of a proliferation assessment and analysis is recognized under NEPA and is a proper subject for a NEPA-based contention.

### **4. The Issues Raised In The Contention Are Material To The Findings The NRC Must Make To Support The Action That Is Involved In The Proceeding**

Under the AEA, the Commission has a legal and non-discretionary duty to consider whether, when granting a license, such an action could be inimical to the common defense and security of the United States or the health and safety of the public. *See, e.g.*, 42 U.S.C. § 2077(c)(2)8 and § 2099. Moreover, the Commission's NEPA analysis must consider the full range of risks to the common defense and security potentially arising from its licensing decision, and must consider all reasonable alternatives that could eliminate or mitigate those risks. *See, San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016 (9th Cir. 2006).

Moral questions aside, the NFS contributions to the U.S. nuclear weapons complex are part of the "common defense and security" of the U.S. The NRC's decision to license the proposed uranium purification process at the NFS facility in Erwin, Tennessee encompasses risks to the health and safety of the public, and to the common defense and security of the United States. Analysis of the positive and negative impacts the purification line may have on

nuclear weapons proliferation concerns is clearly material to the NRC's decision to amend the NFS materials license.

### **5. Concise Statement Of Facts And Opinions, With Source References**

Nuclear weapons proliferation and security issues have been encompassed within NEPA environmental impact assessments and statements since the inception of NEPA. For example, in *Scientists' Institute for Public Information, Inc. v. Atomic Energy Commission*, 481 F.2d 1079 (D.C. Cir. 1973), the D.C. Circuit Court of Appeals required the AEC to prepare a programmatic environmental impact statement (PEIS) on the AEC's Liquid Metal Fast Breeder Reactor (LMFBR) Program in part to address nonproliferation and terrorism in the subsequent LMFBR EIS.

At the preliminary injunction hearing in a 1974 case, *West Michigan Environmental Action Council v. AEC*, Dkt . No . G-58-73 (W.D. Mich. 1974) the Atomic Energy Commission settled the litigation by offering to prepare a generic Programmatic EIS on plutonium recycling, which later came to be known as the "Generic Environmental Statement on Mixed Oxide Fuel" (GESMO), No. RM-50-1, a document subsequently initiated by NRC as the successor to AEC for these matters). The GESMO addressed nuclear weapons proliferation possibilities.

In 2009, the U.S. Department of Energy ("DOE") was required to address nonproliferation issues in its preparation of the "Draft Global Nuclear Energy Partnership Programmatic Environmental Impact Statement" (GNEP PEIS, DOE/EIS-0396). It attempted to do so by relying on a separate "Nonproliferation Impact Assessment: Companion to the Global Nuclear Energy Partnership Programmatic Environmental Impact Statement," prepared by the Office of Nonproliferation and International Security of the National Nuclear Security Administration (NNSA). Along with several other NEPA matters, this artificial separation was challenged in the public comments phase. Subsequent to those critical comments and presumably in part because of them, DOE ceased all work on the GNEP PEIS.

NEPA's environmental impact identification and disclosure procedures have been followed and applied to programs involving storage of nuclear missiles,<sup>18</sup> the testing of nuclear weapons,<sup>19</sup> the destruction of excess nuclear weapons pursuant to a treaty,<sup>20</sup> and transporting chemical weapons.<sup>21</sup> The U.S. Air Force has compiled environmental impact statements as part of its compliance with the Strategic Arms Reduction Treaty II commitments to dismantle missile launching facilities.<sup>22</sup> The Air Force's Global Strike Command recently assessed under NEPA whether updating of the United States' 400 nuclear missile launch silos meets the requirements of the Nuclear Posture Review (NPR), the Nuclear Non-Proliferation Treaty (NPT), the New Strategic Arms Reduction Treaty (New START), and the Comprehensive Test Ban Treaty.<sup>23</sup>

In its 1995 "Record of Decision: Tritium Supply and Recycling Programmatic Environmental Impact Statement," the U.S. Department of Energy, in producing a Programmatic Environmental Impact Statement for the Strategic Arms Reduction Treaty II Protocol, determined that "it was necessary to reevaluate the Reconfiguration Program to insure that alternatives which reflected requirements of a greatly downsized nuclear weapons stockpile would be assessed in the PEIS."<sup>24</sup>

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<sup>18</sup> See, e.g., *Concerned About Trident v. Rumsfeld*, 555 F.2d 817 (D.C. Cir. 1976); *Weinberger v. Cath. Action of Hawai'i*, 454 U.S. 139 (1981).

<sup>19</sup> See *Comm. for Nuclear Resp., Inc. v. Seaborg*, 463 F.2d 783 (D.C. Cir. 1971).

<sup>20</sup> See, e.g., U.S. Dep't of the Army, "Environmental Assessment for the Proposed Elimination of Intermediate-Range and Shorter-Range Missiles Pursuant to the INF Treaty" (1988); Corps of Engineers, Dep't of the Army, "Pershing Missiles, Elimination, Pueblo, Co., et al.: Finding of No Significant Impact," 53 Fed. Reg. 6189 (March 1, 1988).

<sup>21</sup> See *Greenpeace USA v. Stone*, 748 F. Supp. 749, 758-61 (D. Haw. 1990) (NEPA did not apply to a presidential agreement with West Germany to transport nerve gas to a Pacific atoll for destruction but suggesting the impact statement may be needed for actions taken abroad that affect this country or where there is a total lack of environmental assessment).

<sup>22</sup> <https://apps.dtic.mil/sti/pdfs/ADA414685.pdf>

<sup>23</sup> "Draft Environmental Impact Statement for the Ground Based Strategic Deterrent Deployment and Minuteman III Decommissioning and Disposal," <https://drive.google.com/file/d/1aKCcvEq92PdKShP5qWzlxrvwNN9P7zo7/view>, at pp.1-5 to 1-7.

<sup>24</sup> 63 Fed. Reg. 63878 (December 12, 1995).

In its 1999 “Consolidated Record of Decision for Tritium Supply and Recycling,” DOE discussed at length the nonproliferation policy implications of using civil commercial light water reactors to produce tritium used in creating nuclear weapons triggers.<sup>25</sup>

In its “Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex,”<sup>26</sup> DOE analyzed the implications that various production activities at the agency’s Y-12 nuclear weapons facility might have on United States compliance with the Nuclear Non-Proliferation Treaty.

Both the NRC and the Department of Energy are well familiar with the applicability of NEPA concerns to the proposed license amendment.

#### **6. A Genuine Issue Of Law Arises From Omissions From Supplemental ER**

The NFS function to purify HEU constitutes a “major federal action” to be addressed under NEPA because it involves “implementation of treaties and international conventions or agreements, including those implemented pursuant to statute or regulation” and also comprises the “[a]doption of programs, such as a group of concerted actions to implement a specific policy or plan; systematic and connected agency decisions allocating agency resources to implement a specific statutory program or executive directive.” 42 CFR § 1508.1(q)(3)(i), (iii).

In addition, NEPA § 4332(2)(f)<sup>27</sup> expressly calls on Federal agencies to recognize the worldwide and long-range character of environmental problems and to support appropriate initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of humankind's world environment. Further, Executive Order 12114<sup>28</sup> requires Federal officials to consider major Federal actions significantly affecting the environment of the global commons as well as the environments of foreign nations.

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<sup>25</sup> 64 Fed. Reg. 26369, 26373-26374 (May 14, 1999).

<sup>26</sup> <https://www.energy.gov/sites/prod/files/EIS-0387-FEIS-Summary-2011.pdf>, pp. S-14 through S-16.

<sup>27</sup> 42 U.S.C. § 4332.

<sup>28</sup> <https://www.energy.gov/nepa/downloads/executive-order-12114-environmental-effects-abroad-major-federal-actions>

The NFS Supplemental ER<sup>29</sup> contains no reference to relevant international treaty obligations, such as the Treaty on the Nonproliferation of Nuclear Weapons (NPT). The Supplemental ER does not mention federal statutory obligations; the NPT is codified as a federal statute at 22 U.S.C. § 3201 *et. seq.*

The Supplemental ER does not reveal the practical role the proposed uranium purification process would play in the U.S. nuclear weapons complex, nor how that would alter U.S. nuclear weapons readiness or U.S. national security.. By its own admission in the Supplemental ER, the NFS facility is governed by NPT safeguards set forth in 10 CFR Part 73,<sup>30</sup> which are requirements implementing U.S. treaty obligations to prevent sabotage, theft and weapons proliferation. But the words “weapons,” “treaty,” “nonproliferation,” and “proliferation” literally appear nowhere in the Supplemental ER. Consequently, the Supplemental ER, as a baseline document required under NEPA, is seriously incomplete, and as Federal lead agency, the NRC must provide the missing investigation and analysis delineated in this Contention.

## **CONTENTION B: NARROW SCOPE OF PURPOSE AND NEED STATEMENT UNDERCUTS CONSIDERATION OF ALTERNATIVES**

### **1. Proposed Contention**

The purpose and need for the project is expressed in unduly narrow and time-limited terms, which has caused inadequate consideration of the no-build alternative with the result of biasing the NEPA inquiry and decision to be made by NFS and the NRC in favor of amending the license and proceeding with the proposed project.

### **2. Basis For The Contention**

The Purpose and Need Statement was written in November 2021 and refers to a need to bridge a projected interruption in the purification of HEU metal at the Y-12 plant in Oak Ridge, Tennessee. That interruption will be caused by the replacement of equipment at Y-12 and installation of new electrorefining capability there by “2023 at the earliest and will not be capable

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<sup>29</sup> ADAMS No. ML22066B005.

<sup>30</sup> Supplemental ER, ADAMS No. ML22066B005 at 7 (“NFS provides nuclear material safeguards in accordance with the requirements set forth in 10 CFR Parts 70 and 73.”).

of converting oxides to metal until completion of a separate future project.”<sup>31</sup> This Petition is being written in late October 2022, two months from January 1, 2023. Without any record information on the status of the equipment updating and replacement project at Y-12, it is possible that most of the anticipated HEU purification interruption at Y-12 has passed and that implementation of NNSA’s March 2021 plan for a “bridging strategy”<sup>32</sup> at NFS will be a waste of time, resources and taxpayer monies. According to its Fiscal Year 2022 Report to Congress in March 2022, “DOE/NNSA will perform its enriched uranium metal purification in Building 9215 using the electro refining process, which will come online in the 2023 timeframe.”<sup>33</sup> This report, produced a full year after the announcement of the \$57.5 million contract between NNSA and NFS, further states that the Uranium Modernization program “will continue to fund the purification of metal in Building 9212 until the electrorefining process is fully operational, at which point the hazardous wet chemistry, conversion, and reduction operations in Building 9212 will be shut down.”<sup>34</sup>

### **3. The Contention Is Within the Scope Of The Proceeding**

This license amendment proceeding falls within the ambit of the Atomic Energy Act (“AEA”), 42 U.S.C. §§ 2011-2297; and the National Environmental Policy Act of 1969 (“NEPA”), 42 U.S.C. §§ 4321-4347. NEPA regulations require an environmental impact statement to “briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action.” 40 CFR § 1502.13. It is entirely proper to raise a contention which challenges the fairness and adequacy of the purpose and need statement as the driver of alternatives to the proposed project.

### **4. The Issues Raised In The Contention Are Material To The Findings The NRC Must Make To Support The Action That Is Involved In The Proceeding**

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<sup>31</sup> ADAMS No. ML22066B005 at 1.

<sup>32</sup> <https://www.energy.gov/nnsa/articles/contract-awarded-nuclear-fuel-services-uranium-purification-and-conversion>

<sup>33</sup> DOE/NNSA, FY2022 Stockpile Stewardship and Management Plan, p.3-11, <https://www.energy.gov/sites/default/files/2022-03/FY%202022%20SSMP%20March%202022.pdf>

<sup>34</sup> *Id.*

The purpose and need statement under NEPA is important because the purpose and need statement “necessarily dictates the range of ‘reasonable’ alternatives.” *Carmel-by-the-Sea v. U.S. Dep’t. Of Transp.*, 123 F.3d 1142 (9th Cir. 1997). The definition of purpose and need must be reasonable. *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190 (D.C. Cir. 1991). There is no way to know if the statement of purpose and need is reasonable unless it is supported by data and evidence. Furthermore, the agency must not accept out of hand the applicant’s statement of purpose and need. *ELPC v. NRC*, 470 F.3d 676, 683 (7th Cir. 2006), quoting *Simmons v. Corps. of Engineers*, 120 F.3d 664, 666 (7th Cir. 1997). The D.C. Circuit warned, in *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190 (D.C. Cir. 1991) that “[A]n agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency’s power would accomplish the goals of the agency’s action, and the EIS would become a foreordained formality. . . .” An effective purpose and need statement is especially key to whether the no-action alternative has been fairly presented.

Agencies must, to the fullest extent possible, “[s]tudy, develop, and describe appropriate alternatives to recommended courses of action in any proposal. . . .” 42 U.S.C. § 4322(2)(E); *Idaho Conservation League v. Mumma*, 956 F.2d 1508, 1519-20 (9th Cir. 1992). There must be examination of every alternative within the “nature and scope of the proposed action,” *California v. Block*, 690 F.2d 753, 761 (9th Cir. 1982), “sufficient to permit a reasoned choice.”

Although the environmental review mandated by NEPA need not include all theoretically possible environmental effects arising out of an action, the NRC is obliged to make reasonable forecasts of the future. *Northern States Power Co. (Prairie Island Nuclear Generating Plant, Units 1 & 2)*, ALAB-455, 7 NRC 41, 48, 49 (1978); *Hydro Res., Inc.*, LBP-04-23, 60 NRC 441, 447 (2004), *review declined*, CLI-04-39, 60 NRC 657 (2004).

## 5. Concise Statement Of Facts And Opinions, With Source References

The Purpose and Need Statement published in the Supplemental ER states as follows:

The proposed action is the amendment of NFS SNM-124 license to include the Uranium Purification and Conversion Services process.

Legacy uranium processing equipment at the National Nuclear Security Agency's (NNSA) Y-12 plant in Oak Ridge, Tennessee is tentatively planned for shutdown in the 2023 timeframe. Based upon available information, NNSA plans to partially replace this legacy uranium processing system capability with new electrorefining technology to purify high-enriched uranium (HEU) metal. However, this new process will not be available until 2023 at the earliest and will not be capable of converting oxides to metal until completion of a separate future project. Therefore, to maintain the ability to convert oxides to metal, NNSA requires separate HEU purification and conversion capability. To provide both this oxide conversion capability and to hedge against the technology risk associated with the new electrorefining facility, NNSA contracted with NFS to design, license, and demonstrate the capability to perform uranium purification and conversion to uranium metal at the NFS Erwin Facility which is an NRC licensed Category 1 HEU manufacturing facility.<sup>35</sup>

The Supplemental ER was published in November 2021 and, as suggested above, does not contain timely information on the status of the Y-12 legacy equipment replacement project with which NFS is being coordinated.

In addition, NFS itself has acknowledged that the completed building alone, with all plumbing, process equipment, stack, ventilation, etc, will not be ready until September 2024 or even later. NFS has said, "The current proposed duration for construction is approximately 27 months, however is dependent upon funding profile."<sup>36</sup>

NFS predicts a parade of horrors to follow if the new electrorefining purification project isn't constructed in Erwin. These include "land use impacts at another site resulting from construction and start-up activities,"<sup>37</sup> "the transportation of authorized special nuclear materials to an alternative site which could potentially result in new impacts to transportation routes,"<sup>38</sup>

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<sup>35</sup> ADAMS No. ML22066B005 at 1.

<sup>36</sup> NFS Response to the Request for Additional Information, ML22193A034 at p. 4/43 (June 30, 2022).

<sup>37</sup> *Id.* at 49.

<sup>38</sup> *Id.*

“potential impacts to geology and soils from new construction”<sup>39</sup> elsewhere; unspecified “new impacts to water resources”<sup>40</sup> were a new facility to be constructed elsewhere; “potential impacts to ecological resources from new construction”<sup>41</sup> were the facility built elsewhere; increased noise levels at an alternative site as a result of construction and operation of a new facility;<sup>42</sup> potentially affected historic and cultural resources at an alternative site;<sup>43</sup> affected visual and scenic resources at an alternative site;<sup>44</sup> possibly increased unemployment at NFS and in the Region of Influence if the project isn’t built in Erwin;<sup>45</sup> “a potential for environmental justice impacts associated with a new site,”<sup>46</sup> and “negative impacts resulting from the non-approval of the license amendment” causing “counter-productivity of the nuclear material processing objectives of the U.S. Government and the negative effects to the U.S. Department of Energy.”<sup>47</sup>

However, NFS predicts that the new purification line will cause a *doubling* of air pollution over present levels: “The gaseous effluents from the new U-Metal process are similar in attribute and quantity to those emitted from current operations at the NFS facility.”<sup>48</sup> This appears to contradict the following statement from the Supplemental ER, made by NFS in opposition to the no-action alternative: “The proposed license amendment and the activities that have occurred since 2009 have not and will not result in significant adverse impacts to air quality.”<sup>49</sup>

NEPA obliges a federal agency to consider every significant aspect of the environmental impact of a proposed action and to ensure that the federal agency will inform the public that it has indeed considered environmental concerns in its decision-making process. *Baltimore Gas & Elec. Co. v. Natural Resources Defense Council*, 462 U.S. 87, 97 (1983); see also 42 U.S.C. §

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<sup>39</sup> *Id.*

<sup>40</sup> *Id.*

<sup>41</sup> *Id.*

<sup>42</sup> *Id.*

<sup>43</sup> *Id.* at 50.

<sup>44</sup> *Id.*

<sup>45</sup> *Id.*

<sup>46</sup> *Id.*

<sup>47</sup> *Id.*

<sup>48</sup> NFS Response to Requests for Additional Information, ML22193A034 at p. 6/43 (June 30, 2022).

<sup>49</sup> ADAMS No. ML22066B005 at 49.

4332(2)(c) (identifying requirements of an EIS). “The agency must examine the relevant data and articulate a satisfactory explanation for its action including a ‘rational connection between the facts found and the choice made.’” *Motor Vehicle Mfrs. Ass'n of U.S. , Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43, 103 S.Ct. 2856, 77 L.Ed.2d 443 (1983) (quoting *Burlington Truck Lines v. United States*, 371 U.S. 156, 168, 83 S.Ct. 239, 9 L.Ed.2d 207 (1962)).

## **6. There Are Genuine Material Issues Of Law And Fact**

There are two objections raised by this contention: (1) NFS has not conclusively demonstrated that the no-build alternative should be rejected; and (2) the improved Y-12 facility, seen in light of the NNSA's March 2022 stated intention to continue “to fund uranium purification in Building 9212 until the electrorefining process is fully operational” *in Oak Ridge* (not Erwin), must be considered as an additional alternative to construction at Erwin.

The Licensee has undermined its own claims that there will be minimal air quality impacts if the proposed purification line is built and operated in Erwin. Only a timely update as to the status of Y-12 will allow the public to assess how meaningful the no-action alternative really is, because the Purpose and Need Statement constricts consideration of alternatives. This contention must be admitted in order to ensure objective consideration of the no-build alternative with the latter depicted according to its own timeline for completion and availability..

## **CONTENTION C: LEGACY CONTAMINATION IS UNDERSTATED, UNINVESTIGATED AND MISSING FROM CUMULATIVE EFFECTS ANALYSIS IN THE ER**

### **1. Proposed Contention**

NFS has been the contributor as point source to multiple soil and groundwater episodes of industrial chemical contamination throughout its 65-year existence. Over time there have been remediation programs and various attempts to mitigate the presence and intensity of these toxins. They are not adequately identified in the NFS Supplemental Environmental Report. The present status of groundwater contamination is poorly explained and lacks a comprehensive perspective. The possibility of the presence of PFAS chemicals is not addressed. The

documented presence of radioisotopes identified with NFS for miles downstream in the Nolichucky River is unmentioned. None of the groundwater effects of NFS have been incorporated into the ER as part of a cumulative effects analysis.

## **2. Basis For The Contention**

As demonstrated in the factual presentation to follow, the NFS complex historically has for decades been the origination point of, or contributor to, serious industrial contamination. For example, high concentrations of TCE and PCE chemicals have been somewhat remediated, albeit not entirely removed, from groundwater in the vicinity of former waste ponds and pits on the NFS property, and have affected at least one of the City of Erwin's public water system wells. Particles of radioisotopes handled at the NFS plant, including plutonium and U-235, have been found 95 miles downstream of NFS in the Nolichucky River, having traveled past the water intakes of the Jonesborough and Greeneville<sup>50</sup> municipal water systems. The verified presence of PFAS chemicals in the tissues of fish inhabiting the Nolichucky River, coupled with the likelihood of such chemicals having been present and used at the NFS facility, is evidence of more undocumented industrial pollution there that must be accounted for and considered in light of future such emissions and contributions.

The continuing presence, movement and effects of these longtime toxins, in other words, must be updated, investigated and analyzed, since they will continue to be found, perhaps at high concentrations, into the unknown future. The ER does not meaningfully disclose the potential for similar or identical chemicals to be present in the future. It also does not disclose the chemicals that will be emitted into the water from the purification and conversion process that will be limited by regulation although as noted at fn. 47 *supra*, the air emissions from the Erwin plant will double as a consequence of the new purification line.

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<sup>50</sup>NFS failed to note that Greeneville has a water intake downstream from Erwin.

NEPA requires “an agency to evaluate ‘cumulative impacts’ along with the direct and indirect impacts of a proposed action.” *TOMAC, Taxpayers of Michigan Against Casinos v. Norton*, 433 F.3d 852, 864 (D.C. Cir. 2006) (citing *Grand Canyon Tr. v. FAA*, 290 F.3d 339, 345 (D.C. Cir. 2002)). A cumulative impact is “the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.” 40 C.F.R. § 1508.7. “Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.” *Id.* § 1508.7. Under D.C. Circuit precedent, a NEPA cumulative impact analysis must include discussion of “other actions—past, present, and proposed, and reasonably foreseeable—that have had or are expected to have impacts in the same area,” “the impacts or expected impacts from these other actions,” and “the overall impact that can be expected if the individual impacts are allowed to accumulate.” *Grand Canyon Tr.*, 290 F.3d at 345.

### **3. The Contention Is Within The Scope Of The Proceeding**

This license amendment proceeding falls within the ambit of the Atomic Energy Act (AEA), 42 U.S.C. §§ 2011-2297; and the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. §§ 4321-4347. The requirement of cumulative effects analysis is recognized under NEPA and is a proper subject for a NEPA-based contention.

### **4. The Issues Raised In The Contention Are Material To The Findings The NRC Must Make To Support The Action That Is Involved In The Proceeding**

NRC regulations explicitly require the environmental report to include “an analysis of the cumulative impacts of the proposed action when added to the impacts of such excluded site preparation activities on the human environment.” 10 CFR § 51.45(c). And 10 CFR § 51.14(b)<sup>51</sup> incorporates into NRC regulations the Council on Environmental Quality mandate that

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<sup>51</sup>“(b) The definitions in 40 CFR . . . . 1508.25 . . . will also be used in implementing section 102(2) of NEPA.”

environmental impact statements include “impacts, which may be cumulative” within their scope. 40 CFR § 1508.25(c).

## **5. Concise Statement Of Facts and Opinions, With Source References**

### **a. Inadequate Disclosure Of Uranium And Plutonium Contamination In The Nolichucky River Basin**

NFS’s Supplemental ER insufficiently and inaccurately discusses the scientifically verified escape of Uranium and Plutonium radioisotopes into the Nolichucky River, which is down-gradient and less than 1000 feet from the NFS complex.

Michael Ketterer, Ph.D., chemistry professor emeritus,<sup>52</sup> collected extensive data from environmental samples of water, soil, sediment, and mollusks in and about the Nolichucky commencing in 2010 and personally conducted laboratory measurements that unequivocally demonstrate the offsite presence of NFS-derived contamination of the surroundings, as well as the entire Nolichucky River downstream of NFS. In his Declaration, which was filed concurrently with this Petition, Dr. Ketterer stated that “[e]xtensive evidence conclusively demonstrates releases of enriched uranium (U) and plutonium (Pu) from NFS’s operations into the ambient environment<sup>53</sup>. . . Nolichucky River water, downstream of NFS, exhibits U contamination from NFS, as the 235U/238U is elevated; this finding cannot be explained by any other causes besides NFS.”<sup>54</sup>

Dr. Ketterer further explains that “[t]he Nolichucky River is receiving contamination from NFS through two principal pathways: the permitted outfall at River Mile 94.6, and nonpoint source recharge of groundwater into the river. A June 2010 grab sample collected from the Mile 94.6 outfall revealed the presence of enriched U consisting of ~ 20% 235U. . . .<sup>55</sup>

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<sup>52</sup> Dr. Ketterer’s extensive qualifications are delineated through a URL embedded in his attached Declaration of Michael E. Ketterer, Ph.D., October 26, 2022 (Ketterer Declaration).

<sup>53</sup> Ketterer Declaration, para. 1.

<sup>54</sup> *Id.*, para. 2.

<sup>55</sup> *Id.*, para. 3.

In addition, this scientist documented, “Nonpoint sources of uranium are also entering the Nolichucky River through subterranean pathways. Mass balance considerations dictate that not all of the enriched U present in the Nolichucky River can be accounted for via the Mile 94.6 outfall. Moreover, in August 2011, I personally observed the discharge of an underground spring into the river, known locally as Whaley Spring,” from sampling of which Dr. Ketterer identified enriched Uranium. Dr. Ketterer asserts that “[t]hese observations indicate the indisputable presence of subterranean pathways for entry of NFS-contaminated groundwater into the Nolichucky River. It is clear that the NFS facility is having a definite, observable negative impact on local groundwater quality, ultimately spreading contamination in water underlying NFS and neighboring properties, before discharging to the river.”<sup>56</sup>

Of the spread of radioactivity downstream in the Nolichucky, Dr. Ketterer adds: “The transport of enriched U, in dissolved form, has occurred throughout the Nolichucky River system. In May 2011, I collected sediment cores from the mouth of the Nolichucky where it enters Douglas Lake; these sediment cores were found to exhibit enriched uranium. . . . It is apparent that dissolved U is present, from groundwater discharges near NFS, in the river water and subsequently, the U is being incorporated into the sediments at the sediment-water interface.”<sup>57</sup> Douglas Lake is 95 river miles downstream from the NFS wastewater outfall. Further, Dr. Ketterer notes, “Sediments, water, and mollusks found at Davy Crockett Lake, downstream of NFS, have also been found to contain enriched U. This has also occurred as a result of discharges of NFS-affected contaminated groundwater into the Nolichucky River.”<sup>58</sup> Davy Crockett Lake is 49 river miles downstream from the NFS wastewater outfall.

As if the presence of enriched Uranium – which as a heavy metal as well as alpha emitter contributes to the toxicity of the Nolichucky River – weren’t bad enough, Dr. Ketterer further observes that “The NFS plant has also released plutonium into the environment as a

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<sup>56</sup> *Id.*, para. 4.

<sup>57</sup> *Id.*, para. 6.

<sup>58</sup> *Id.*, para. 7.

result of past plant operations. Plutonium of non-fallout origin has been found in sediments of the pond adjacent to the Erwin Linear Trail, sediments of Davy Crockett Lake, and in sediments at North Indian Creek. These locations also exhibit enriched U. . . . This material is clearly incongruent with weapons testing fallout, and could only have plausibly originated from NFS.”<sup>59</sup>

The Supplemental ER offers a comparison table of radiological contamination of the Nolichucky upstream and downstream of the NFS wastewater outfall.<sup>60</sup> While NFS is careful not to state in the text that the Erwin plant is decidedly polluting the Nolichucky River with Uranium radioisotopes, it unmistakably is doing so according to its own table. What NFS fails to admit, analyze and discuss, however, is specifically which Uranium isotopes are being dumped into public waters. Moreover, despite Dr. Ketterer’s research, NFS provides no mention nor accounting whatsoever for the verified presence of Plutonium emanating from the plant and perching in river bottom sediment scores of miles downstream.

Radiological contamination is not mere water pollution which can be somewhat reversed in the proper physical environment. Most Uranium isotopes have half-lives of hundreds or thousands of years. Plutonium’s half-life is 24,000 years. The Erwin facility is 65 years old and apparently will continue to emit Uranium and other radioisotopes for years to come, so the radiological contamination of the Nolichucky is continuing and accumulating. Analysis and disclosure of these detriments within the NEPA document must address the cumulative impacts of past, present and future contamination of the River.

#### **b. Previously-Unidentified PFAS Chemicals May Be Present In Groundwater**

On June 15, 2022, the U.S. Environmental Protection Agency (EPA) issued interim updated drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) that replace those EPA issued in 2016. PFOA and PFOS are PFAS substances.

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<sup>59</sup> *Id.*, para. 8

<sup>60</sup> Figure 5, “Radiological Surface Water Quality, Supplemental ER, p. 29.

PFAS chemicals are a large and diverse structural family of compounds used in myriad commercial applications due to their unique properties, such as resistance to high and low temperatures, resistance to degradation, and nonstick characteristics. Although PFAS were manufactured and used broadly in commerce beginning in the 1940s, particular concern over potential adverse effects on human health grew in the early 2000s with the discovery of PFOA and PFOS in human blood. Since that time, hundreds of PFAS have been identified in water, soil, and air. Many PFAS chemicals are environmentally persistent, bioaccumulative, and have long half lives in humans, particularly the longer chained carbon species such as PFOA and PFOS. Most uses of PFOA and PFOS were phased out by U.S. manufacturers in the mid-2000s although there are a limited number of ongoing uses.<sup>61</sup>

The EPA warned in its announcement that “The updated advisory levels, which are based on new science and consider lifetime exposure, indicate that some negative health effects may occur with concentrations of PFOA or PFOS in water that are near zero.”<sup>62</sup> These interim health advisories will remain in place until EPA establishes a National Primary Drinking Water Regulation.

The EPA also issued final health advisories for two other PFAS chemicals, perfluorobutane sulfonic acid and its potassium salt (PFBS) and for hexafluoropropylene oxide (HFPO) dimer acid and its ammonium salt (“GenX chemicals”). In chemical and product manufacturing, GenX chemicals are considered a replacement for PFOA, and PFBS is considered a replacement for PFOS.<sup>63</sup> Of grave concern is EPA’s observation that “Based on current methods, the health advisory levels for PFOA and PFOS are below the level of both detection (determining whether or not a substance is present) and quantitation (the ability to

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<sup>61</sup> Federal Register Notice, “Lifetime Drinking Water Health Advisories for Four Perfluoroalkyl Substances,” <https://www.govinfo.gov/content/pkg/FR-2022-06-21/pdf/2022-13158.pdf>

<sup>62</sup> <https://www.epa.gov/sdwa/drinking-water-health-advisories-pfoa-and-pfos>

<sup>63</sup> *Id.*

reliably determine how much of a substance is present). *This means that it is possible for PFOA or PFOS to be present in drinking water at levels that exceed health advisories even if testing indicates no level of these chemicals.*<sup>64</sup>

Petitioner ECAN does not have direct evidence that PFAS chemicals are present in the groundwater beneath, or in the vicinity of the NFS complex in Erwin. However, the many historic industrial uses of PFAS chemistry, particularly in fire suppression and also in high-tech lubrication, suggest the possibility that in 65 years of industrial activity, PFAS chemicals have been used there. Significantly, the Tennessee Department of Environment and Conservation found in a 2008-2009 sampling of fish tissue that PFAS had been detected in fish found in all major Tennessee rivers, including the Nolichucky River, which is down-gradient and less than a thousand feet from the NFS complex.<sup>65</sup>

ECAN's expert witness, Dr. Michael Ketterer, recommended that there be an inquiry into the presence of PFAS at NFS: "Additional water-soluble hazard substances such as per- and polyfluorinated alkyl substances (PFAS) are likely present in contaminated groundwater underlying NFS, and would be expected to be following the same water transport pathways, into the Nolichucky as the enriched U. To the best of my knowledge, this potential scenario has not been investigated by NFS nor regulatory agencies. There is an urgent need to evaluate this possible PFAS contamination scenario."<sup>66</sup>

The growing recognition that PFAS chemicals are ubiquitous in the environment of long-time industrial installations, combined with increasing awareness of their severe threats to individual and public health even in miniscule quantities, militates in favor of investigating whether such contamination is present, proximate to NFS.

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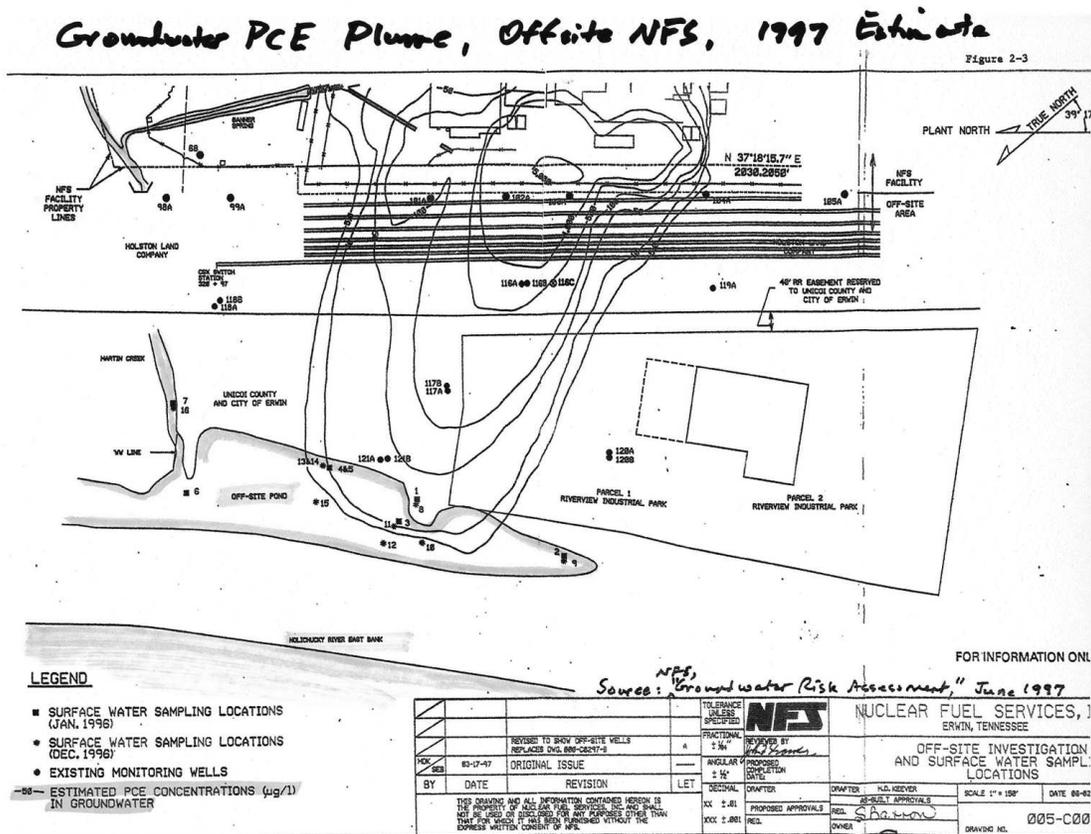
<sup>64</sup> <https://www.epa.gov/sdwa/questions-and-answers-drinking-water-health-advisories-pfoa-pfos-genx-chemicals-and-pfbs#q7>

<sup>65</sup> Tennessee Department of Environment and Conservation, "Per- and Polyfluoroalkyl Substances (PFAS) Update on TDEC PFAS Activities," (2020), [https://www.tn.gov/content/dam/tn/environment/boards/documents/board-of-water-quality-oil-and-gas/2020-meetings/october-2020/wqog\\_powerpoint\\_oct-20-2020.pptx](https://www.tn.gov/content/dam/tn/environment/boards/documents/board-of-water-quality-oil-and-gas/2020-meetings/october-2020/wqog_powerpoint_oct-20-2020.pptx)

<sup>66</sup> Ketterer Declaration, para. 9.

**c. Urgent need to evaluate groundwater underlying NFS**

Plumes of contaminants are known to exist in the groundwater underlying NFS, and offsite migration of tetrachloroethylene (PCE) has occurred. "From 1957 until 1980, NFS used four ponds on the plant site to retain liquids discharged from the various processes...The exact contents of the ponds are unknown".<sup>67</sup> In 1978, NRC Region II performed independent sampling and analysis of the ponds "to determine the types and concentrations of radioactive materials present" – but chemical contamination was not assessed.<sup>68</sup> The licensee's 1997 map of the PCE plume shows that groundwater contaminated with PCE had reached into the ponding area next to Erwin's Linear Trail.<sup>69</sup>



<sup>67</sup>Minutes, House Committee on Energy and Commerce Hearing on Nuclear Safety, Sept. 18, 1986 ADAMS No. ML093010396, p. 134 ("Markey Hearing").

<sup>68</sup> *Id.*

<sup>69</sup> NFS, Groundwater Risk Assessment (1997), Figure 2-3.

NFS's Supplemental ER identifies the source of the groundwater contamination as the three unlined ponds, the Pond 4 disposal area, and the North Site burial grounds.<sup>70</sup> "For remediation purposes, the primary groundwater contaminants of concern (COCs) include tetrachloroethylene (PCE), uranium (U), and technetium (Tc-99). Not only are PFAS chemicals not analyzed for their presence and potential groundwater migration but possible thorium and plutonium plumes – which the 1978 Region II sampling program found in the ponds – have also been disregarded. The impact of PCE bioremediation gone wrong needs to be thoroughly addressed to determine the extent to which the plumes of TCE, 1,2-DCE and VCI have migrated and carried other contaminants with them."<sup>71</sup>

Nor can these zones of groundwater flow be viewed in isolation, absent their connection to and cumulative effects on, the Nolichucky River. Testimony given in the Markey Hearings reported that monitoring wells had detected contaminants "leaking in Banner Hill Spring".<sup>72</sup> Given the fact that the unlined settling ponds straddled Banner Spring Branch in close proximity to the spring, it seems likely that the testimony was factual. Therefore, Banner Hill Spring, from which the enclosed Banner Spring Branch emanates, may be another source of contaminated groundwater that eventually flows into the Nolichucky. Through Amendment 52, the requirement to sample Banner Spring Branch was removed. However, that does not absolve the NRC from the responsibility to determine the extent to which Banner Hill Spring is contaminated. As then-Congressman Ed Markey recognized, "national security cannot be used as a shibboleth to evade obligations to protect workers, nearby citizens, and taxpayers".<sup>73</sup>

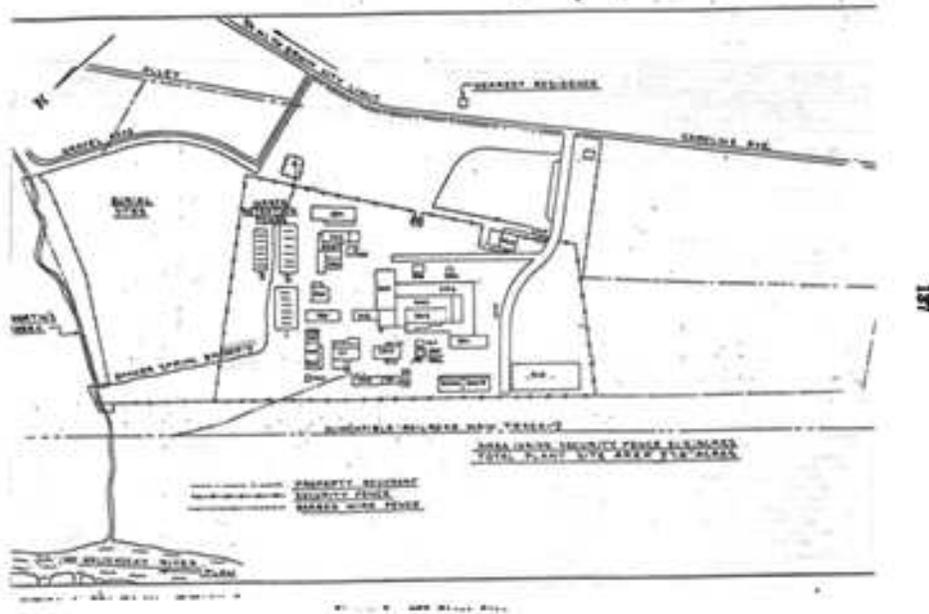
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<sup>70</sup> Supplemental ER, p.29.

<sup>71</sup> *Id.*

<sup>72</sup> Markey Hearing at 191.

<sup>73</sup> Markey Hearing at 5.



“NFS identified two faults and five fractured zones beneath the NFS site” as well as evidence of karstic features.<sup>74</sup> Due to “complex” groundwater flow from “structural deformation” in the Erwin area, tracing contaminants can be unpredictable.<sup>75</sup> The possibility that offsite contaminant plumes would intersect the Railroad Well’s capture zone has long been a concern expressed to the NRC. Additionally, Geraghty & Miller<sup>76</sup> found that “groundwater flow directions and rates at the NFS facility are “generally unaffected” by the operation of the Railroad Well”, but wouldn’t rule it out.<sup>77</sup>

Because “recharge to the alluvium and shallow bedrock is primarily from rainfall infiltration from the ground surface”, airborne releases of PFAS chemicals and other persistent pollutants could enter groundwater through surface deposition. Monitoring must be done on the transport of long-lived chemicals and radionuclides in the environment. And, as was done for fluoride deposition and accumulation studies, soil samples should be collected within a 5-mile

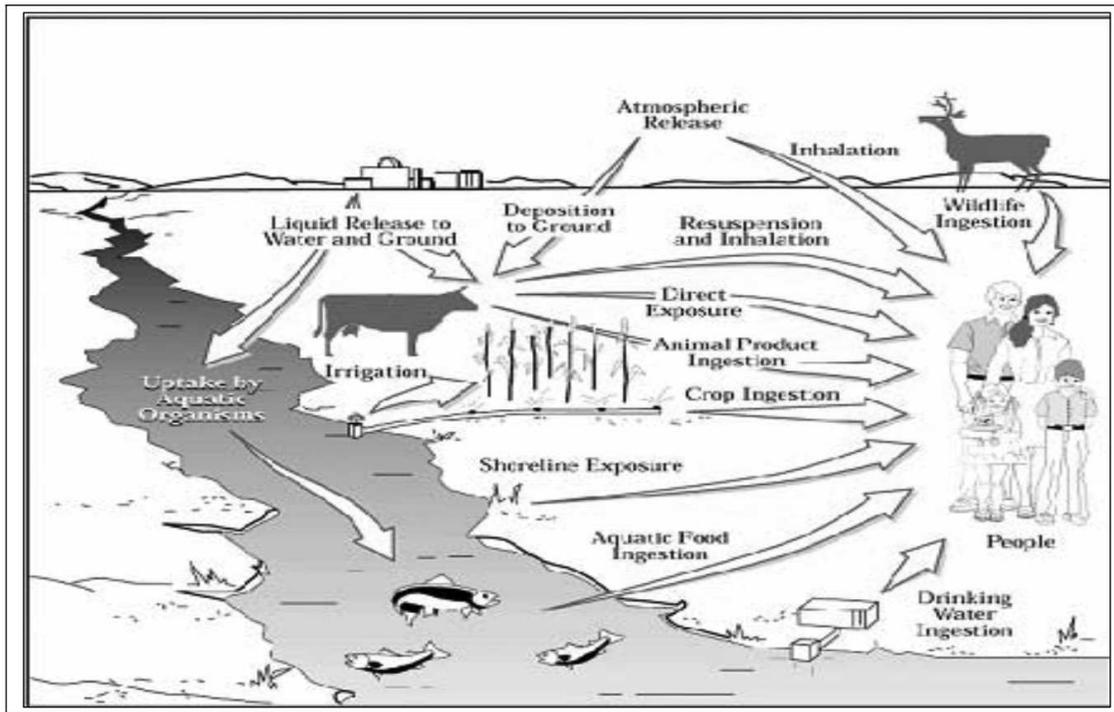
<sup>74</sup>Final Environmental Assessment for the Renew of NRC License No. SNM-124 for NFS (ML112560265) p.3-18 (2011), <https://www.nrc.gov/docs/ML1125/ML112560265.pdf>

<sup>75</sup> Environmental Impact Assessment (EIA), ADAMS No. ML14339A518, p.2-12) (1978)

<sup>76</sup> Enclosure C, Attachment 1, ARCADIS, Geraghty & Miller Report, Aug. 1999 (ML101760067).

<sup>77</sup> “RR Well Capture Zone Analysis,” Supplement to 1984 NFS Environmental Report ADAMS No. ML12068A165 p.4-1 (1996).

radius of NFS.<sup>78</sup>



**Figure 7. Potential Exposure Pathways**

Source: ATSDR, Public Health Assessment for Nuclear Fuel Services, Inc., May 29, 2007, p.22:  
<https://www.atsdr.cdc.gov/hac/pha/nuclearfuelservices/nuclearfuelservicespha052907.pdf>

The Licensee's failure to address sinkhole activity and karst terrain in the Rome Formation underlying its site represents a dereliction of responsibility to provide information crucial to a thorough review of potential environmental impacts of the proposed action. That the NRC failed to request information on this important issue will cause, unless corrected, a dangerously incomplete assessment of the proposed action's potential impacts on the environment.

The alarm of the Erwin community at the opening of a sinkhole next to its elementary school was sensed by media throughout the area and even caught the attention of a drilling company in Florida (see <https://www.ridgedrilling.com/about-us.aspx>). Public officials hired HSA Engineers & Scientists which produced Report of Subsurface Exploration and Geotechnical

<sup>78</sup> (EIA, p.2-16 & 2-18).

Evaluation Services Site Suitability Study The Love Chapel Elementary School dated February 1, 2013. The report concluded that “the risk of sinkhole development ... is considered moderate to high.” HSA also found that the school was “underlain by the Rome Formation” (p.7) -- just like NFS -- and that “karst terrain is found within...the Rome Formations (p.12).

The Nuclear Regulatory Commission knew full well that the public was concerned about sinkhole activity in Erwin and about their safety should a sinkhole cause a building collapse at the licensee. The agency also knew of the HSA report but apparently failed to read it. As a result, at the meeting held at the Unicoi County Courthouse on August 30, 2012, the NRC asserted that sinkholes couldn't happen at NFS because it lies on the Rome Formation – just like Love Chapel School. The fact that the dye that was poured into the sinkhole appeared in the pond next to the Linear Trail within 48 hours was ignored in 2012 and now a decade later. The agency's failure to recognize the existence of karst terrain in the Rome Formation is a dangerous oversight that needs to be corrected by a thorough assessment of groundwater flows that could introduce NFS-sourced contaminants to surface water as well as private and public drinking water wells.

## **6. There Are Genuine Material Issues Of Law And Fact**

The Supplement Environmental Report inadequately discloses and discusses the presence of various Uranium radioisotopes verified as far as 95 river miles down the Nolichucky River from the NFS facility. The report makes no mention at all of the well-documented fact of Plutonium contamination at the same distances downriver of the plant.

There is no recognition nor investigation in the Supplemental ER of the likely contamination of groundwater and the Nolichucky River with PFAS chemicals as a result of activities at NFS over 65 years.

The complicated and troubling chemically and radiologically polluted groundwater flowing beneath and adjacent to the NFS industrial site is poorly explained in the Supplemental

ER. The results of past remediation are not reassuring, and the prospects of continuing toxicity from legacy activities must be considered in light of ongoing groundwater flow and future, poorly disclosed water contamination that will happen as a consequence of the new purification and conversion process at NFS.

The Supplemental ER contains little to no analysis of the cumulative effects of the aforementioned industrial chemical groups, considered either individually or collectively respecting their past, present and future effects. Compliance with NEPA's clear mandates for cumulative effects analysis is obligatory here.

Both an Environmental Assessment and Environmental Impact Statement must examine “the action’s direct, indirect and cumulative effects.”<sup>79</sup> 42 U.S.C. § 4332(C)(iii); 40 C.F.R. §§ 1502.16, 1508.7, 1508.8;<sup>80</sup> *see also Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.21 (1976) (EA must have “hard look” at the environmental consequences of the proposed action, including its direct, indirect, and cumulative effects); *see also EarthReports, Inc. v. FERC*, 828 F.3d 949, 953 (D.C. Cir. 2016); *also*, 40 C.F.R. §§ 1508.9, 1508.25(c). *See, e.g., S. Utah Wilderness All. v. Norton*, 326 F. Supp. 2d 102, 119–20 (D.D.C. 2004) (allowing BLM to conduct an EA instead of an EIS because “[t]he determination of whether BLM should have prepared an EIS turns largely on whether the EA was adequately conducted and properly took cumulative impacts into account” and the BLM had dedicated an entire chapter in the EA to cumulative impacts analysis); *Native Village of Point Hope v. Salazar*, 730 F. Supp. 2d 1009, 1012 (D. Alaska 2010) (deferring to the agency’s informed discretion in approving an oil and gas lease when the agency devoted 76 pages of its EIS to a cumulative impacts assessment).

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<sup>79</sup> “Effects” and “impacts” are synonymous as they are used in NEPA’s implementing regulations. 40 C.F.R. § 1508.8.

<sup>80</sup> “Direct” environmental effects “are caused by the [agency’s] action and occur at the same time and place.” 40 C.F.R. § 1508.8. “Indirect” environmental effects “are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.” *Id.* “Cumulative” environmental effects account for “the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.” *Id.* § 1508.7.

When no cumulative effects analysis is forthcoming, courts have held agency decisions to be arbitrary and capricious. See *Sierra Club v. Mainella*, 459 F. Supp. 2d 76, 107–08 (D.D.C. 2006) (holding the National Park Service's decision to allow oil and gas drilling operations on NPS lands was arbitrary and capricious because the Service had failed to consider the cumulative impacts of the drilling operations); *Wyo. Outdoor Council v. U.S. Army Corps of Eng'rs*, 351 F. Supp. 2d 1232, 1237 (D. Wyo. 2005) (vacating permit allowing the release of coalbed methane water into above ground reservoirs because the Army Corps had failed to consider cumulative impacts); *Te-Moak Tribe v. U.S. Dep't of the Interior*, 608 F.3d 592, 601 (9th Cir. 2010) (concluding that the BLM's cumulative impact analysis of proposed gold mining operations on public lands was insufficient).

**CONTENTION D: QUALITY ASSURANCE**  
**CONTENTION D: FUEL CYCLE FACILITY REGULATIONS ARE INSUFFICIENT TO**  
**PROTECT PUBLIC HEALTH, SAFETY & SECURITY BECAUSE THEY LACK STRINGENT**  
**QUALITY ASSURANCE REQUIREMENTS**

**1. Proposed Contention**

NRC's Fuel Cycle Facility regulations have failed to achieve a sustained safety culture at NFS and therefore, do not protect the public, workers, or environment.

**2. Basis for the Contention**

NFS is the only company in the nuclear industry to be repeatedly called to the annual Agency Action Review Meetings (AARM) meetings convened in the Nuclear Regulatory Commission's Chambers. Yet, this corporation continues to receive contracts without serious regulatory questioning about how NFS addresses worker safety and public health and safety.

Petitioner ECAN presents considerable history below of safety violations at NFS over the past decade. Several were serious enough to be listed in the NRC's Report to Congress on Abnormal Occurrences. NFS has experienced repeated Nuclear Criticality Safety deficiencies.

There is historical trouble at the plant with the timely completion of correct actions. There have been multiple physical security-related violations since license renewal, including one that required Escalated Enforcement Action.

Sixteen environmental releases triggered outside/offsite notification, 1997-2021. A 2009/2010 Independent Safety Culture Assessment (ISCAI) listed (6) deficiencies.

### **3. The Contention Is Within The Scope Of The Proceeding**

This license amendment proceeding falls within the ambit of the Atomic Energy Act (AEA), 42 U.S.C. §§ 2011-2297. Quality assurance is a staple area of regulation of facilities such as NFS, and is a proper subject for a contention.

### **4. The Issues Raised In The Contention Are Material To The Findings The NRC Must Make To Support The Action That Is Involved In The Proceeding**

Under the AEA, the Commission has a legal and non-discretionary duty to consider whether, when granting a license, such an action could be inimical to the common defense and security of the United States or the health and safety of the public. See, e.g., 42 U.S.C. § 2077(c)(2)8 and § 2099. The adequacy of Quality Assurance implicates considerations of public health and safety in the NRC's deliberations of whether to issue the license amendment.

### **5. Concise Statement Of Facts and Opinions, With Source References**

NFS is the only company in the nuclear industry to be repeatedly called to the annual Agency Action Review Meetings (AARM) meetings convened in the Nuclear Regulatory Commission's Chambers.<sup>81</sup>

There have been thirty-two (39) known safety violations and unresolved items since NFS's license renewal in 2012.<sup>82</sup> There have been three (2) times where accidents and

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<sup>81</sup> For example, see 2003 - Discussed at AARM - ML031250269; 2007 - Attended AARM - ML080580192; 2008 - Discussed at AARM - ML080580192; 2009 - Attended AARM - ML090550079; 2011 - Attended AARM - ML111260502.

<sup>82</sup> NRC Inspection Reports 2012-2022:

2012: ML12030A226, ML12072A191, ML12122A186

2013: ML13011A159, ML13030A347, ML13100A098, ML13190A150, ML13305A075

2014: ML14028A071, ML14212A026, ML14241A553

2015: ML15027A241, ML16107A039, ML15209A728, ML15264A785, ML15296A160,

aftermaths at NFS have been serious enough to be listed in NRC's Report to Congress on Abnormal Occurrences <sup>83</sup>

NFS has displayed repeated Nuclear Criticality Safety (NCS) deficiencies.<sup>84</sup>

NRC inspections have identified a weakness with the timeliness of completing actions in the corrective action program. Deficiencies that represent noncompliance with the agency's NCS Program and procedures have been permitted to persist for several years until they are addressed. For most of the inspection concerning the criticality report, the alarm system covering the NFS wastewater treatment facility (WWTF) was malfunctioning, resulting in a stop work order for this process.<sup>85</sup>

There have been seven (7) known physical security-related violations since license renewal. One involved Escalated Enforcement Action.<sup>86</sup> There have been sixteen (16) known environmental releases which triggered outside notification, 1997-2021.<sup>87</sup>

A 2009/2010 Independent Safety Culture Assessment (ISCAII) listed (6) deficiencies, as follows:

- Need for licensee to develop and provide formal training to the appropriate front-line supervisors to improve their understanding and use of Operating Experience.
- Licensee lacked a way to document the review for major organizational changes during the change process review by the Change Control Board.

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ML15309A525 and related ML15296A385  
2016: ML16120A089, ML16341A885  
2017: ML17045A037, ML17173A142, ML17290A763, ML18002A363  
2018: ML18005A018, ML181909A306, ML19178A282, ML18236A554, ML18305A005  
2019: ML19262D347  
2020: "No violations of more than minor significance"  
2021: ML21118B020, ML21176A156, ML21225A074, ML22027A552, ML21272A257, ML21287A667, ML21293A113  
2022: ML22178A025, ML22213A046, ML22223A213

<sup>83</sup> (1) NUREG-0900 - Vol 29, Pages 1 & 2 - Spill of 35 liters of HEU at NFS, March 6, 2006; CAUSE: Failure to maintain configuration control of facility equipment and failure to comply with procedures.

(2) NUREG-0900 - Vol. 33, Pages C-4 & C-5, Adverse Chemical Event at NFS, Oct. 3, 2009, Civil Penalty of \$140,000, Severity Level III Violation.

<sup>84</sup> See NRC NCS Inspection 70-143/2013-201, (ML13100A098).

<sup>85</sup> *Id.*

<sup>86</sup> NRC Inspection Reports; Classified OOU.

<sup>87</sup> 2009 NFS Environmental Report, ML91900072, updated by Supplemental Environmental Report, Nov. 30, 2021 (ML22066B005).

- Update the procedure for conducting Corrective Action Program (CAP) effectiveness reviews, and update the list of personnel required to be trained on the procedure.
- Two Unresolved issues: Deficiencies in the consistent application of the Corrective Action Program (CAP) within the Security and Material Control and Accounting (MC&A) Departments.
- Need for Licensee to develop consistent standards and expectations for supervisors with regards to improving oversight of work activities.<sup>88</sup>

Clearly, NFS has repeatedly violated minimal security and safety regulations and should not be authorized to process nuclear weapons material without strict Quality Assurance (QA) requirements.

A different QA regime pertains to all the operations and management at DOE's site in Oak Ridge where uranium purification processes are performed in Building 9212. Prime contractors are contractually obligated to have QA management, as well as nuclear quality control engineers with the technical expertise who report to them, to protect worker health and safety, to protect public health and safety, and to ensure the security of nuclear weapons material.

NFS is merely required to follow QA controls on the shipment of special nuclear material (SNM).

Per ASME NQA-1,<sup>89</sup> (§ 1.7) a NQA-1 Quality Program Certificate is not available to an organization in certifying the quality assurance program for:

> §§ 1.7.1 Activities pertaining to weaponry,

> §§ 1.7.2 Owners of nuclear facilities – facilities for power generation, spent fuel storage, waste management, fuel reprocessing, nuclear material processing, fuel fabrication and other related facilities.

The activities at NFS disqualify it from ASME certification. Although NFS is not required to meet the provisions of ASME-NQA-1, the licensee is required to implement and maintain a

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<sup>88</sup> NRC Integrated Inspection Report, ML13030A347.

<sup>89</sup> ASME NQA-1 Certification Program Requirements, (February 10, 2014), <https://www.asme.org/getmedia/065e9a4f-8ed0-4a38-922f-2118e1e1dcfc/Information-and-Procedures-Obtaining-NQA-1-Certificate.pdf>

graded QA program commensurate with the risk posed by the facility. In the case of NFS, the risks are highly likely to increase as a consequence of the new uranium purification process.

The Quality Assurance requirements for new and existing fuel fabrication facilities are specified in 10 CFR § 70.62(d), "Management Measures," and 10 CFR § 70.64, "Requirements for New Facilities or New Processes." Management Measures are those functions performed by the licensee that are applied to items relied on for safety (IROFS), to ensure the items are available and reliable to perform their functions when needed. Management Measures include (1) Configuration Management, (2) Maintenance, (3) Training and Qualifications, (4) Procedures, (5) Audits and Assessments, (6) Incident Investigations, (7) Records Management and (8) Other QA Elements. This regulation also *requires* each applicant or licensee to establish management measures to ensure compliance with the performance requirements of § 70.61.<sup>90</sup> The inherent weakness in the QA approach at Nuclear Fuel Services is that where the quality program is described as just a bunch of functions and there are no organizational designated staff to perform those functions, then they typically become "everybody's responsibility," which means, in practical terms, that no one does them.

Two examples of NFS' many problems with Management Measures are instructive. On April 30, 2012, an NRC Integrated Inspection caused the NRC to file two Notices of Violation.<sup>91</sup> One was for NFS' failure to ensure that IROFS FIRE-18 would perform its intended function when needed to comply with the performance requirements. "Specifically, the inspectors noted a penetration in this fire wall carrying communication cables that contained no sealing compound within the fire seal. Thus, the penetration seal no longer met the two hour National Fire Protection Association fire rating as required by the Nuclear Fuel Services Integrated Safety Analysis. **The lack of adequate management measures** pertaining to the maintenance of a

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<sup>90</sup> 10 CFR § 70.64(b).

<sup>91</sup>NRC Integrated Inspection Report 70-143/2012-002 (ML12122A186) (April 30, 2012)..

firewall and its associated penetrations adversely affected its two hour fire rating and thus the function and reliability of an IROFS.<sup>92</sup> (Emphasis added).

In the other violation, NFS was accused of mismanaging its safety program such that it: failed to ensure that some configuration controlled equipment in building 302, each classified as IROFS, remained reliable to perform its intended safety function. The NRC inspectors discovered multiple examples of failed structural fittings that supported storage columns designated as IROFS. **The lack of adequate management measures** enabled the degradation of the structural supports that adversely affected the stability and reliability of the storage columns designated as IROFS.<sup>93</sup> (Emphasis added).

## **6. There Are Genuine Material Issues Of Law And Fact**

NFS's operations necessarily involve handling ultrahazardous material in risky conditions that should prompt the highest QA standards and structure. It is ironic that a private production facility that must produce precision products for use in military reactors and thermonuclear weapons is not regulatorily held to the strictest standards of Quality Assurance, The NRC's regulatory discretion certainly extends to the imposition of tougher QA requirements. The deep history of NFS violations, noncompliances, and NRC special enforcement measures, when combined with the risks associated with adding the new purification process, should herald the initiation of tougher Quality Assurance standards.

ASME requires for NQA-1 grade Quality Assurance that the organization "Ensure that quality is achieved and maintained by those assigned responsibility for performing work, with achievement verified and documented by persons not directly responsible for performing the work."<sup>94</sup> Also, the organization must "Ensure that persons or organizations performing quality

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<sup>92</sup> *Id.*

<sup>93</sup> *Id.*

<sup>94</sup> ASME NQA-1 Quality Assurance Manual Checklist (2015), p. 2/48 of pdf, [https://www.asme.org/wwwasmeorg/media/ResourceFiles/Shop/certification-accreditation/NQA-Certification/NQA-Certification\\_Forms-and-Resources\\_Checklist.pdf](https://www.asme.org/wwwasmeorg/media/ResourceFiles/Shop/certification-accreditation/NQA-Certification/NQA-Certification_Forms-and-Resources_Checklist.pdf)

assurance functions have: (1) sufficient well-defined responsibility, access to work areas and organizational freedom to: 1.C (a) identify quality problems, 1.C (b) initiate, recommend or provide solutions through departmental channels, (c) verify implementation of solutions, and 1.C (d) assure that further processing, delivery, installation or use is controlled until proper disposition of a nonconformance, deficiency or unsatisfactory condition has occurred.”<sup>95</sup> Independence of QA auditors as third parties, coupled with their having the power to stop work to correct adverse circumstances are not characteristics of the quality efforts at NFS. A dramatic upgrade in safety and quality culture at NFS is urgently needed ahead of the installation of the purification and conversion process.

### III. CONCLUSION

Petitioner ECAN is required only to “articulate at the outset the specific issues they wish to litigate.”<sup>96</sup> The Atomic Safety and Licensing Board may not use the contention admissibility standards as “a fortress to deny intervention.”<sup>97</sup>

Petitioner ECAN should be granted organizational standing and its Contentions A, B, C and D should be admitted for adjudication.

**WHEREFORE**, Petitioner Erwin Citizens Awareness Network, Inc. prays the Commission grant it leave to intervene in this license amendment proceeding; that ECAN’s contentions be admitted for adjudication; that the Commission find that NEPA and AEA standards and requirements have been violated; and that Nuclear Fuel Services be denied the requested license amendment.

Respectfully,

October 31, 2022

/s/ Terry J. Lodge  
Terry J. Lodge, Esq.  
316 N. Michigan St., Suite 520

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<sup>95</sup> *Id.*

<sup>96</sup> *Dominion Nuclear Conn., Inc.*, (Millstone Nuclear Power Station, Units 2 & 3), CLI-01-24, 54 NRC 349, 359.

<sup>97</sup> *Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, & 3), CLI-99-11, 49 NRC 328, 335 (1999).

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Counsel for Petitioner Erwin Citizens  
Awareness Network, Inc.

## DECLARATION OF ALFRED JOHN DAVIES

I, Alfred John "Buzz" Davies, am the Declarant herein, and I hereby make the following statements under the penalty of perjury:

1) I am an adult citizen of the United States, am not under disability, and make the following statements voluntarily.

2) My residence address is 441 Ohio Street, Erwin, TN 37650. I live one mile from the Nuclear Fuel Services, Inc. (NFS) industrial facility complex located in Erwin, Tennessee.

3) I understand that the Nuclear Regulatory Commission (NRC) is considering granting a license amendment to the BWXT Nuclear Fuel Services (NFS) facility in Erwin, Tennessee to supplement the company's Special Nuclear Materials (SNM) license by adding equipment and personnel to provide Uranium Purification and Conversion Services.

4) I am a retired nuclear quality control engineer for a federal radiological materials contractor in Oak Ridge, TN and possess some technical understanding of the present processes and proposed purification and conversion of high enriched uranium (HEU) at the NFS facility in Erwin. As I understand the proposal, it appears that there will be a significant risk of criticality (*i.e.*, uncontrolled nuclear chain reaction) accidents, with possible serious physical harm to workers and even the public. I am also aware of a history of uranium hexafluoride (UF<sub>6</sub>) accidents at the NFS facility which have caused offsite radiological effects to surrounding land. I am also aware of the past findings of Dr. Michael Ketterer documenting the presence of radionuclides in the Nolichucky River for many miles downstream of NFS which are identifiable as originating from NFS. I reasonably believe that there will be continued or expanded potential for more such radiological accidents and spills during plant operations with a new process line that addresses purer, more volatile, HEU.

5) Even without the proposed purification and conversion line, normal operations at NFS in Erwin are inherently dangerous to public health and the environment. As long as I have lived in Erwin, I have been concerned for my personal safety and that of others who live in my household from radiation exposure in the event of a serious accident, vandalism or a terrorist attack involving radioactive material-handling activities at the plant. I am worried that those in my household and I might suffer health consequences and serious property damage.

6) I disagree with NFS' conclusion in its November 2021 Supplemental Environmental Report that adding the new purification and conversion process will result in no additional public health and environmental threat to me and my community. Removing radionuclide impurities from HEU will require chemical processes that pose radioactive materials handling dangers above and beyond the present ones at NFS.

7) As a longtime observer of the NFS facility in Erwin, I know that NFS has produced materials for use in United States nuclear weapons production program efforts, and suspect that the purified HEU generated by the proposed line also would be incorporated into nuclear

weapons. Nuclear weapons are supposedly governed by U.S. commitments to international treaties. The National Environmental Policy Act (NEPA) document to be written by the NRC for the proposed license amendment must include a nuclear weapons proliferation impact assessment to conform to NEPA disclosure requirements.

8) I am also concerned that the NRC has continued to interpret the Atomic Energy Act and its regulations such that NFS is exempt from implementing a formal 10 CFR Part 50 Appendix B Nuclear Quality Assurance Program. There is no formal quality assurance organization in the plant's management structure. There is no head of Quality that reports to the President of NFS, or who has stop work authority.

9) I hereby designate Erwin Citizens Awareness Network (ECAN), a grassroots environmental betterment organization of which I am a member located in Erwin, Tennessee, to represent my interests in a petition to intervene before the NRC in opposition to the NFS license amendment. I also request that ECAN be accorded standing to proceed on my behalf. My interests will not be adequately represented unless ECAN is allowed to participate as a full party in this proceeding on my behalf.

10) Further, Declarant saith naught.

October 30, 2022

  
(Signature) Alfred John Davies

**DECLARATION OF AUTHORIZED OFFICER OF ERWIN CITIZENS  
AWARENESS NETWORK (ECAN) FOR LEAVE TO INTERVENE  
IN BWXT NUCLEAR FUEL SERVICES LICENSE AMENDMENT PROCEEDING**

Under penalty of perjury, I, Linda Cataldo Modica ("Declarant"), state as follows:

1) I am the President of Erwin Citizens Awareness Network ("ECAN"), a Tennessee nonprofit grassroots organization the address of which is P.O. Box 1152, Jonesborough, TN 37659. As President, I am authorized to sign this Declaration.

2) ECAN is a nonprofit corporation incorporated in 2010 under the Tennessee Nonprofit Corporation Act. The primary purpose of this public benefit corporation is to research and investigate issues involving the nuclear industry that may affect the health, safety and environment of Erwin, Tennessee, Unicoi County, as well as other downstream and downwind counties. The corporation seeks to protect surface and ground water quality, air quality, and lands from degradation due to the actions of the nuclear industry in the Erwin area, doing so via public education, advocacy, and monitoring the oversight by the Nuclear Regulatory Commission, the Tennessee Department of Environment and Conservation, the U.S. Environmental Protection Agency, and other governmental agencies.

3) Alfred John "Buzz" Davies of Erwin, TN is a longtime member of ECAN. I have reviewed his Declaration seeking to intervene and be represented by ECAN in a request by BWXT Nuclear Fuel Services (NFS) to modify NFS's Special Nuclear Material license by adding equipment and personnel to provide Uranium Purification and Conversion Services.

4) ECAN concurs with Mr. Davies that the new product line will add to the risks of nuclear criticality (*i.e.*, uncontrolled nuclear chain reaction) accidents at the plant, with possible serious physical harm to workers and even the public. We are also aware of a history of uranium hexafluoride (UF<sub>6</sub>) accidents at the NFS facility which have caused offsite radiological effects to surrounding land, and of the presence of radionuclides which originated from NFS in the waters near Erwin's Linear Trail and in the Nolichucky River for many miles downstream of the licensee. ECAN further agrees that NFS's ongoing production efforts in support of the U.S. nuclear weapons enterprise calls for a nuclear weapons proliferation impact assessment under the National Environmental Policy Act (NEPA), and that the socioeconomic and environmental impacts of the detonation of nuclear weapons -- which contain uranium equivalent to that planned to be produced at NFS -- must also be assessed. ECAN concurs with Mr. Davies that NFS maintains an inadequate program of production quality assurance that increases the risk of accidents and that the need for this new process to be conducted in Erwin has not been demonstrated.

5) In order to ensure that the license amendment decision for the new line at NFS protects the interests of ECAN's members in a public health and in a safe and healthy environment, ECAN seeks to intervene on behalf of its member Alfred John "Buzz" Davies, whose declaration is attached.

6) ECAN intends, on behalf of Mr. Davies and its other members to take all legal actions necessary to ensure the fairness and integrity of the license amendment proceeding and to have the NRC consider all issues bearing on the safety and health of ECAN members, the broader public, and the physical environment.

7) Further, Declarant saith naught.

October 30, 2022

Linda Cataldo Modica.  
(Signature) Linda Cataldo Modica