Resisting Static Inertia: A Statutory Framework for the Nuclear Regulatory Commission's Authority over Private Nuclear Storage Licensing

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This Note analyzes the various approaches that United States courts have taken on the licensing authority of the Nuclear Regulatory Commission as it relates to the private temporary storage of spent nuclear fuel. It seeks to establish a sound statutory basis for the Nuclear Regulatory Commission's (NRC's) authority to issue such licenses under the Atomic Energy Act (AEA) by recharacterizing spent nuclear fuel as a "byproduct material" under the meaning of the Act. It then looks to the enumerated uses of byproduct material to establish that the NRC has the authority to issue licenses to the private sector to store spent nuclear fuel. Finally, it will argue that the Nuclear Waste Policy Act (NWPA) could not and should not be interpreted as restricting or superseding the NRC's existing licensing authority under the AEA. This interpretation of the AEA and NWPA is more reflective of the statutory language and provides for a better nuclear waste policy.

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I. INTRODUCTION

Nuclear energy is unique in its ability to sow discord, and for good reason. For some, the benefits are astronomical, presenting the ability to create massive amounts of reliable carbon-free electricity.[1] For others, the costs can be catastrophic. One needs only to look at the nuclear disasters at Chornobyl, Fukushima, or Three Mile Island to understand this contention. However, disagreement runs through all corners of the nuclear debate, including cost allocation concerns,[2] regulation concerns,[3] and, increasingly, cost-benefit concerns as new green energy sources become more viable.[4]

One of the major recurring themes of the nuclear debate is, and will continue to be, what to do with spent nuclear fuel. Recently, in *Texas v. NRC* (2023), the Fifth Circuit Court of Appeals created a circuit split by adding a legal dimension to what was already an intense political debate on the country's power portfolio that presents a possible watershed moment in federal nuclear waste policy. Despite having assumed licensing authority for private interim storage for decades, the Fifth Circuit ruled that the Atomic Energy Act did not authorize the Nuclear Regulatory Commission to issue such licenses. The decision cited both statutory definitions within the Atomic Energy Act, as well as what it saw as conflict with the subsequently passed Nuclear Waste Policy Act, to strike down the Nuclear Regulatory Commission's ability to license away-from-reactor private interim storage installations. This Note will assess the legal conflicts this split creates, advocating for a novel statutory interpretation of the Atomic Energy Act that

1. *Advantages and Challenges of Nuclear Energy,* OFFICE OF NUCLEAR ENERGY (June 11, 2024), https://www.energy.gov/ne/articles/advantages-and-challenges-nuclear-energy [https://perma.cc/DK 8H-MD82].

2. Paul Rodgers & Charles D. Gray, *State Commission Treatment of Nuclear Plant Cancellation Costs*, 13 HOFSTRA L. REV. 443 (1985). See also DP Parker, *Who Pays? An analysis of the Allocation of the Costs of Canceled Nuclear Power Plants after* Duquesne Light Co. v. Barasch, 50 OHIO ST. L.J. 999 (1989).

3. Elizabeth Nichols & Aaron Wildavsky, *Nuclear Power Regulation: Seeking Safety, Doing Harm*, 11 AEI J. ON GOV'T AND SOC'Y 45 (1987). *See also* Paul L. Joskow, *The Future of Nuclear Power in the United States: Economic and Regulatory Challenges* (AEI-Brookings Joint Ctr. For Regul. Stud., Working Paper No. 06-25, 2006).

4. Demet Suna & Gustav Resch, *Is Nuclear Economical in Comparison to Renewables?*, 98 ENERGY POLICY 199 (2016). *See also* Nicolas Boccard, *Nuclear Power Versus Renewables: A Scale Perspective*, 24 CLEAN TECH. AND ENV'T POL'Y 1 (2021).

directly authorizes such licensing by the Nuclear Regulatory Commission and assuages concerns posed by the existence of the National Waste Policy Act. In order to understand the context of the conflict introduced by the recent Fifth Circuit decision, some background on the history of nuclear waste policy and existing solutions is needed.

The story of the United States' nuclear waste policy has been one of stagnating federal efforts and of leaving questions around spent fuel build-up to the future while continuing to mass-produce nuclear power. Spent nuclear fuel builds up at the sites of nuclear power plants in either pool storage or dry cask storage. These facilities have finite space to apportion to storage and face various safety and security concerns. Private off-site storage represents a commercially feasible alternative to the eternal buildup of nuclear waste at power plant sites, including decommissioned sites. The Fifth Circuit's decision in *Texas v. NRC* dispenses with decades of precedent and accepted practices by holding that the NRC holds no authority to license such private activities and threatens to hold any non-federal storage or repository solution hostage to a historically polarized and unmotivated Congress.

This Note will begin by providing a background on the history and status of nuclear energy and spent nuclear fuel storage in the United States. Next, Part II of this Note examines the Atomic Energy Act, and places spent nuclear fuel within the enumerated category of "byproduct material," which, to date, no court has officially ruled despite the plain language of the statute. After spent fuel is classified, the authorization statutes of the Atomic Energy Act are assessed in Part III, which finds the NRC possesses authority to license private off-site nuclear fuel. Finally, this Note concludes in Part IV by arguing that the Nuclear Waste Policy Act in no way restricted the NRC's authority over private licensing, thereby keeping decades of appellate precedent intact as well as potentially unveiling a solution for moving spent fuel to safer, more manageable locations until ultimately a permanent repository solution is found.

II. BACKGROUND

This section first explains the history of the United States' growth of nuclear power production through incentivization policies and regulations. Next, this growth is contextualized within the regulatory schemes and solutions adopted to help manage the amount of produced spent nuclear fuel. Finally, the current state of nuclear waste

storage in the United States is examined, and the controversy at issue in *Texas v. NRC* is introduced.

A. Nuclear Regulatory Policy in the United States

The history of nuclear energy begins with the secretive World War II project at Los Alamos that culminated in the nuclear explosions over Nagasaki and Hiroshima.[5] Despite this tragic beginning, the United States saw the project's potential to contribute to energy generation in the country. In 1946, Congress passed the Atomic Energy Act, noting that the science behind nuclear chain reactions had "attained the stage at which the release of atomic energy on a large scale is practical" and declaring it to be the policy of the United States to ensure "the development[] and utilization of atomic energy . . . be directed toward improving the public welfare, increasing the standard of living, and strengthening free competition in private enterprise."[6] Several legislative actions catalyzed rapid expansion of the country's nuclear power capacity, but this catalyzation was not balanced with legislation to deal with the accumulation of spent nuclear fuel, leading to the growing problem faced today.

1. Incentivizing Commercial Nuclear Power

At the time of the technology's inception, the U.S. government controlled all aspects of nuclear applications.[7] The Atomic Energy Act of 1946 aimed to transfer some control over nuclear power to private entities for commercial use. The Act also created the Atomic Energy Commission, which would later become the Nuclear Regulatory Commission (NRC) through the Energy Reorganization Act in 1974.[8] Eight years later, the Atomic Energy Act of 1954 (AEA) would help effectuate these goals by directing the Atomic Energy Commission to institute a licensing scheme for private entities to build and operate nuclear power plants.[9] The AEA provided the Atomic Energy

5. Rinjiro Sodei, *Hiroshima/Nagasaki as History and Politics*, 82 J. AM. HIST. 1118, 1120–21 (1995).

6. Atomic Energy Act of 1946, 42 U.S.C. § 2011 et seq. (1946).

7. Pac. Gas & Elec. Co. v. State Energy Res. Conservation & Dev. Comm'n, 461 U.S. 190, 206 (1983) ("Until 1954 . . . the use, control and ownership of nuclear technology remained a federal monopoly.").

8. Atomic Energy Act of 1954, 42 U.S.C. §§ 2011–2021 (1954); *see also* Energy Policy Act of 2005, 42 U.S.C. § 15801 et seq. (2005).

9. LINCOLN L. DAVIES ET AL., ENERGY LAW AND POLICY 815 (3d ed. 2021).

Commission exclusive authority over privately owned nuclear power plants and radioactive nuclear materials via licensing power.[10]

An additional legislative boost to commercial nuclear power came in the form of the Price-Anderson Act of 1957. The Price-Anderson Act made owners of commercial reactors responsible for all liability for judicial damages to the public arising from nuclear operations but also required the NRC to limit liability through two layers of insurance.[11] First, all licensed nuclear plants must be covered by the maximum liability insurance commercially available, which is $500 million as of January 1, 2024.[12] Further, any damages to the public exceeding that amount are to be assessed equally among all other licensed nuclear plants above 100 megawatts through "retrospective premiums," which are capped at around $158 million per reactor.[13] The Price-Anderson Act also covers all contractors who operate reactors owned by the Department of Energy (DOE), originally up to $10 billion, but that amount was raised in 2023 to $16.6 billion.[14] These insurance requirements significantly reduce the financial risk associated with operating a nuclear reactor. The Price-Anderson liability system is set to expire on January 1, 2026.[15] As a result of these two pieces of legislation, federal policy incentivized the rapid deployment of commercial nuclear energy without establishing a solution to the build-up of nuclear waste.[16]

2. The Nuclear Waste Policy Act and the Yucca Mountain Project

In the middle of the 20th century, the government and private entities operated under the assumption that spent nuclear fuel (SNF), the radioactive waste of the nuclear power process, would be reprocessed

10. Atomic Energy Act of 1954, 42 U.S.C. §§ 2011–2021 (1954).

11. UNITED STATES NUCLEAR REGULATORY COMMISSION, THE PRICE-ANDERSON ACT: 2021 REPORT TO CONGRESS (2021) (NUREG/CR-7293).

12. 10 C.F.R. § 140 (2023).

13. CONG. RSCH. SERV., IF10821, PRICE-ANDERSON ACT: NUCLEAR POWER INDUSTRY LIABILITY LIMITS AND COMPENSATION TO THE PUBLIC AFTER RADIOACTIVE RELEASES (2024), https://crsreports.congress.gov/product/pdf/IF/IF10821 [PDF on file with the Columbia Journal of Environmental Law].

14. *Id.*; *see also* DEPARTMENT OF ENERGY, PRICE-ANDERSON ACT (2023), https://www.energy.gov/sites/default/files/2023-02/PAA%20Report%20January%202023_0.pdf [https://perma.cc/37BT-G2LS].

15. CONG. RSCH. SERV., *supra* note 13.

16. DAVIES ET AL., *supra* note 9, at 862.

for the creation of new fuel rather than be stored or disposed of.[17] However, this assumption was abandoned in the 1970s, and federal policy began centering around the burial of SNF in geological depositories.[18] This pivot is reflected by the Nuclear Waste Policy Act of 1982. The Act was the federal government's first (and only) legislative attempt at creating a federal solution to the SNF problem. The stated purpose of the Nuclear Waste Policy Act of 1982 was the development of a centralized, off-site repository for the disposal of high-level radioactive waste and SNF generated at nuclear plants.[19] The DOE was given the responsibility to site, build, and operate a permanent disposal repository, while the NRC was given the responsibility of licensing the DOE's activities in accordance with statutory and regulatory guidelines. The 1982 Act gave a timeline for the DOE to nominate at least five potential sites for the repository and to recommend three to the President.[20] In 1987, the new Nuclear Waste Policy Act (NWPA) put the sole geographic focus for a repository at Yucca Mountain, Nevada,[21] beginning a bitter, lengthy, and stagnating political battle.

Part of the rationale for limiting the 1987 version of the Act to just the Yucca Mountain site was to deter delay—ironic due to the decades of delay that would result anyway. The decision focused federal attention on a single location and bypassed the need to compare Yucca Mountain with other potential sites.[22] Another contributing reason was that prior to 1987, the federal government had already spent almost $10 billion on the site.[23] The Yucca Mountain project began a rocky start in the decade after the NWPA. Immediately after the 1987 Act was signed, the Nevada legislature passed two bills purporting to ban the storage of nuclear waste in their state.[24] The following decades would be marred by both legal and political opposition.

17. Richard B. Stewart & Jane B. Stewart, *Solving the Spent Nuclear Fuel Impasse*, 21 N.Y.U. ENVTL. L.J. 1, 8–9 (2014).

18. *Id.* at 9.

19. Nuclear Waste Policy Act of 1982, Pub. L. No. 97-425, 96 Stat. 2201 (codified as amended at 42 U.S.C Ch. 108).

20. THOMAS A. COTTON, UNCERTAINTY UNDERGROUND: YUCCA MOUNTAIN AND THE NATION'S HIGH-LEVEL NUCLEAR WASTE 33 (ALLISON M. MACFARLANE & RODNEY C. EWING EDS. 2006).

21. 42 U.S.C. § 10172(a).

22. COTTON, *supra* note 20, at 33.

23. William Beaver, *The Demise of Yucca Mountain*, 14(4) THE INDEP. REV. 535, 535-536 (2010).

24. *Nevada Sues to Block Nuclear Waste Dump*, N.Y. TIMES (Dec. 28, 1989), https://www.nytimes.com/1989/12/28/us/nevada-sues-to-block-nuclear-waste-dump.html [PDF on file with the Columbia Journal of Environmental Law].

In Nevada, opposition to the proposed depository was a prerequisite for any statewide election.[25] Senator Harry Reid, the long-time majority leader from Nevada, spent decades fighting the project.[26] Delays began to plague the project. The NWPA required the DOE to begin accepting SNF at the site by 1998,[27] but by then, the DOE estimated the earliest possible achievement of that milestone was 2010.[28] In 2001, President Bill Clinton vetoed a bill that required the DOE to move waste to Nevada within 18 months of the project being licensed.[29] It was not until 2008 that the DOE officially submitted its license application for the Yucca Mountain project.[30] The Obama administration effectively shut down the project in 2009 when the DOE cut all funding for the site.[31] In 2010, President Barack Obama established the United States Blue Ribbon Commission on America's Nuclear Future (BRC).[32] The BRC was tasked with conducting a review of policies and providing recommendations in regard to SNF.[33] The BRC came out with eight key recommendations, including the adoption of a consent-based approach to nuclear waste facilities and the creation of a new organization directed to implement the new waste management program and prompt efforts to develop one or more geological disposal facilities.[34] These recommendations led the Department of Energy to adopt a "consent-based" process for siting depository and storage locations, however, little further progress was made

25. Beaver, *supra* note 23, at 541.

26. KTNV Staff, *Harry Reid's Legacy: A Staunch Opponent of Yucca Mountain Nuclear Waste Disposal Site*, KTNV LAS VEGAS (Dec. 28, 2021), https://www.ktnv.com/news/harry-reids-legacy-a-staunch-opponent-of-yucca-mountain-nuclear-waste-disposal-site [https://perma.cc/75PT-V68A].

27. 42 U.S.C. § 10222(a)(5)(b).

28. Nuclear Waste Acceptance Issues, 60 Fed. Reg. 21793 (May 3, 1995).

29. *President Vetoes Measures to Send Nuclear Waste Site to Nevada*, N.Y. TIMES (Apr. 26, 2000), https://www.nytimes.com/2000/04/26/us/president-vetoes-measure-to-send-nuclear-waste-to-site-in-nevada.html [PDF on file with the Columbia Journal of Environmental Law].

30. U.S. DEPARTMENT OF ENERGY OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT, YUCCA MOUNTAIN REPOSITORY LICENSE APPLICATION (Nov. 2008), https://www.nrc.gov/docs/ML0907/ML090700843.pdf [PDF on file with the Columbia Journal of Environmental Law].

31. Ben Geman & Katie Howell, *Department of Energy Favors Renewables, Cuts Yucca Mountain*, SCIENTIFIC AMERICAN (May 7, 2011), https://www.scientificamerican.com/article/doe-cuts-yucca/ [https://perma.cc/V65S-W37A].

32. *Presidential Memorandum – Blue Ribbon Commission on America's Nuclear Future*, THE WHITE HOUSE (Jan. 29, 2010), https://obamawhitehouse.archives.gov/the-press-office/presidential-memorandum-blue-ribbon-commission-americas-nuclear-future [https://perma.cc/UXJ2-S27Y].

33. *Id*.

34. REPORT TO THE SECRETARY OF ENERGY, BLUE RIBBON COMMISSION ON AMERICA'S NUCLEAR FUTURE (Jan. 2012), https://www.energy.gov/ne/articles/blue-ribbon-commission-americas-nuclear-future-report-secretary-energy [PDF on file with the Columbia Journal of Environmental Law].

outside of procedural changes.[35] President Donald Trump's Secretary of Energy, Rick Perry, began to reignite the Yucca Mountain project, but President Trump shut down that project similar to his predecessor.[36] In 2021, Jenifer Granholm, President Joseph Biden's Secretary of Energy, also vocalized opposition to the project.[37] In the same hearing that Granholm asserted opposition to the Yucca Mountain project, she expressed an intention to "look at what the Blue Ribbon Commission did [on the disposal of used nuclear fuel]," indicating both a reluctance to revitalize the Yucca Mountain project and a return to the BRC's "consent-based" siting process in its stead. In summary, the Yucca Mountain project and the NWPA it rests on seem to be as doomed as it appeared decades ago.

B. The State of Nuclear Waste Storage in the United States

After decades of promoting nuclear energy with little regard for the waste that comes with it, the United States finds itself in a worrisome situation. The country has over 90,000 Metric Tons of Uranium (MTU) of SNF from commercial power plants that must be stored, and SNF grows by 2,000 MTU each year.[38] The United States has the largest fleet of nuclear power plants in the world.[39] It is also among the oldest fleets in the world with little signs of a more youthful future: only two new nuclear reactors have become operational since 1996.[40] The fleet's size and age sit in tension with the fact that ninety-six

35. MARK HOLT, CONG. RSCH. SERV., R42853, NUCLEAR ENERGY: AN OVERVIEW OF CONGRESSIONAL ISSUES (Jan. 2024), https://crsreports.congress.gov/product/pdf/R/R42853/30 [PDF on file with the Columbia Journal of Environmental Law].

36. Maggie Haberman, *One Side of a Nuclear Waste Fight: Trump. The Other: His Administration*, N.Y. TIMES (Feb. 23, 2020), https://www.nytimes.com/2020/02/23/us/politics/trump-yucca-mountain-nevada.html [PDF on file with the Columbia Journal of Environmental Law].

37. *Biden nominee Confirms Opposition to Yucca Mountain*, WORLD NUCLEAR NEWS (Jan. 29, 2021), https://world-nuclear-news.org/Articles/Biden-nominee-confirms-opposition-to-Yucca-Mountai [https://perma.cc/B8DP-WTNL].

38. *Nuclear Waste Disposal*, U.S. GOV'T ACCOUNTABILITY OFF., https://www.gao.gov/nuclear-waste-disposal [https://perma.cc/3T6C-UWUH]; Mitch Jacoby, *As Nuclear Waste Piles Up, Scientists Seek the Best Long-term Storage Solutions*, CHEMICAL & ENGINEERING NEWS (Mar. 30, 2020), https://cen.acs.org/environment/pollution/nuclear-waste-pilesscientists-seek-best/98/i12 [https://perma.cc/6YCE-5HSZ].

39. MYCLE SCHNEIDER ET AL., THE WORLD NUCLEAR INDUSTRY STATUS REPORT 2022 146 (3rd ed. 2023), https://www.worldnuclearreport.org/IMG/pdf/wnisr2022-v3-hr.pdf [https://perma.cc/Q5HM-T3CQ].

40. Elesia Fasching et al., *First New U.S. Nuclear Reactor since 2016 is now in operation*, U.S. ENERGY INFO. AGENCY: TODAY IN ENERGY (Aug. 1, 2023), https://www.eia.gov/todayinenergy/detail.php?id=61106 [https://perma.cc/C9BB-TUKX] (explaining the only two nuclear plants operational since 1996 are Watts Bar Unit 2 in 2016 and Vogtle Unit 3 in 2023).

nuclear reactors generate approximately 20% of the total annual electricity in the country.[41] While additional spending was made available for nuclear power via the Inflation Reduction Act and the Infrastructure Investment and Jobs Act to help modernize and extend the lifespan of the fleet,[42] this also will lead to additional nuclear waste for which there is little capacity. Moreover, despite the federal government's new funding efforts, there does not seem to be an indication of new nuclear construction.[43] A newly apparent question is how to deal with the NWPA's mandate of on-site nuclear waste storage as some nuclear sites begin the decommissioning process.

There are various methods used to store spent nuclear fuel, and the upcoming Section explains several of these methods, as well as their potential benefits. It then explains how the NRC and Congress have treated these options through rule promulgation and Congressional action.

1. Spent Nuclear Fuel Storage Methods

Both during and after operation, the NRC allows several kinds of nuclear waste storage. There is both pool storage and dry cask storage, the latter of which can either be at the site of the reactor or away-from-reactor. Private off-site SNF storage facilities generally utilize dry cask storage, which provides a variety of benefits, including security and longevity.

Spent fuel pools are the first step of the storage process and are designed to cool the SNF after use. They are made from reinforced concrete walls between two and ten feet thick and around forty feet deep.[44] Originally, spent fuel was supposed to be stored for less than a year before being shipped to reprocessing plants; however, as the

41. LANCE N. LARSON, CONG. RSCH. SERV., IF11201, NUCLEAR WASTE STORAGE SITES IN THE UNITED STATES (Apr. 2020), https://sgp.fas.org/crs/nuke/IF11201.pdf [https://perma.cc/68ZQ-36WG].

42. THE WHITE HOUSE, BUILDING A CLEAN ENERGY ECONOMY: A GUIDEBOOK TO THE INFLATION REDUCTION ACT'S INVESTMENTS IN CLEAN ENERGY AND CLIMATE ACTION (Jan. 17, 2023), https://www.whitehouse.gov/wp-content/uploads/2022/12/Inflation-Reduction-Act-Guidebook.pdf [https://perma.cc/N3U8-V4DZ].

43. Although there has been a great deal of interest as to the possibility of small modular reactors, none have been built thus far and the technology still appears to be at least years away from viability. *See* WORLD NUCLEAR ASS'N, SMALL NUCLEAR POWER REACTORS (Feb. 2024), https://www.world-nuclear.org/information-library/nuclear-fuel-cycle/nuclear-power-reactors/small-nuclear-power-reactors.aspx [https://perma.cc/PA25-FHGX]; *see also* HOLT, *supra* note 35.

44. 1 U.S. NUCLEAR REGUL. COMM'N, NUREG-2157, GENERIC ENVIRONMENTAL IMPACT STATEMENT FOR CONTINUED STORAGE OF SPENT NUCLEAR FUEL 2-11 (Sept. 2014) [hereinafter GEIS].

assumption that the fuel would be reprocessed faded, spent fuel pools began to fill up.[45] A typical spent fuel pool has a storage capacity of about 700 MTU and is designed to reach its capacity limit about thirty-five years into the licensed operational life of the reactor.[46] After these thirty-five years, the SNF is designed to be removed from the fuel pool and transferred to a dry cask storage system because SNF cannot be retained in wet storage over long periods.[47] The first dry storage facility was licensed by the NRC in 1986 for the Surry Nuclear Power Plant in Virginia.[48]

Once the SNF is at the point that it can be safely removed from spent fuel pools, it is transferred to Independent Spent Fuel Storage Installations (ISFSIs), where the spent fuel is stored in dry casks made of cement and steel, which is welded shut and uses a ventilation system to cool the rods.[49] These ISFSIs are often located at reactor sites and need to be licensed by the NRC.[50] Of the seventy-eight existing ISFSIs, only eleven exist away from a reactor.[51] These away-from-reactor installations are the types being pursued in New Mexico and Texas and are at issue in the newly-created circuit split. One of the primary benefits of away-from-reactor storage facilities is that they can accept nuclear waste from various reactors, which can ease on-site storage constraints on a more flexible basis.[52]

2. Spent Nuclear Fuel in the Decommissioning Process

The aging nuclear fleet in the United States means many plants are currently being decommissioned or will be decommissioned in the near future, leaving SNF on-site despite the reactor not operating, turning the facility into an "ISFSI-only site."[53] In the 1990s, nuclear power plants began to be decommissioned without a viable option for

45. *Id.* at 2-12.

46. *Id*.

47. *Id.* at § 2.2.1.

48. Moamen G. El-Samrah et al., *Spent Nuclear Fuel Interim Dry Storage; Design Requirements, Most Common Methods, and Evolution: A Review*, 160 ANNALS OF NUCLEAR ENERGY 108408 (May 2021).

49. DAVIES ET AL., *supra* note 9, at 811.

50. GEIS, *supra* note 44, at 2-13.

51. *U.S. Independent Spent Fuel Storage Installations*, UNITED STATES NUCLEAR REGULATORY COMMISSION (Feb. 2022), https://www.nrc.gov/images/reading-rm/doc-collections/maps/isfsi.png [https://perma.cc/R7NU-YBTJ]. (Although the NRC lists 79 facilities and twelve away-from-site storage facilities, these relate to licenses, and Private Fuel Storage never became operational, although receiving a license.)

52. GEIS, *supra* note 44, at 2-18.

53. GEIS, *supra* note 44, at § 2.2.1.

permanent SNF disposal due to stalls with the Yucca Mountain project, which led the NRC to issue regulations allowing licensees to sell off parcels of the site while maintaining others for the storage of SNF.[54] In order to avoid the proliferation of such sites, in 2008 the House Appropriations Committee requested that the DOE "develop a plan to take custody of spent fuel currently stored at decommissioned reactor sites to both reduce costs that are ultimately borne by the taxpayer and demonstrate that DOE can move forward in the near-term with at least some element of nuclear waste policy."[55] Despite the request, the DOE concluded that it did not have the authority to do so under the NWPA and ultimately took no such action.[56] Instead, the current decommissioning process leaves most of the choice to the licensee, provided they are compliant with NRC guidelines.[57]

There are three ways that SNF can be dealt with through the decommissioning process. In the first option, "DECON," the equipment and structures of the facility that contain radioactive contaminants are removed or decontaminated to a level that allows for the termination of the license.[58] This is the fastest decommissioning method as all fuel and equipment is removed from the site.[59] The next option, "SAFSTOR," places the facility in a stable condition and is maintained in such state until it is eventually decontaminated and dismantled to a level that allows for the termination of the license.[60] Lastly, "ENTOMB" allows the encasement of all radioactive components of the plant within a substance such as concrete, which is then maintained and surveilled until radioactivity decays to a level permitting the termination of the license and unrestricted release of the property.[61] The length of this requisite period is difficult to define because

54. DECOMMISSIONING NUCLEAR POWER PLANTS, UNITED STATES NUCLEAR REGULATORY COMMISSION, https://www.nrc.gov/docs/ML0403/ML040340625.pdf [https://perma.cc/L823-DY9D]; *see also* Radiological Criteria for License Termination, 62 Fed. Reg. 39058 (Jul. 21, 1997) (to be codified at 10 C.F.R. pts. 20, 30, 40, 50, 51, 70, 72).

55. U.S. DEPARTMENT OF ENERGY OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT, REPORT TO CONGRESS ON THE DEMONSTRATION OF THE INTERIM STORAGE OF SPENT NUCLEAR FUEL FROM DECOMMISSIONED NUCLEAR POWER REACTOR SITES iii (2008), https://www.energy.gov/articles/report-congress-plan-interim-storage-spent-nuclear-fuel-decommissioned-reactors [https://perma.cc/3XSS-W9SG].

56. *Id*.

57. GEIS, *supra* note 44, at 2-26.

58. *Id*.

59. *Decommissioning Nuclear Reactors is a Long-term and Costly Process*, U.S. ENERGY INFORMATION ADMINISTRATION (Nov. 2017), https://www.eia.gov/todayinenergy/detail.php?id=33792 [https://perma.cc/69RE-PGLY].

60. GEIS, *supra* note 44, at 2-26.

61. *Id.*

no licensees have ever committed to using it.[62] By 2017, ten commercial nuclear reactors in the United States had successfully decommissioned,[63] and there are currently 23 nuclear sites undergoing the decommissioning process.[64] There are seven ISFSI-only sites while only three sites have successfully terminated their license, meaning the land outside of the ISFSI has been adequately decontaminated.[65] Private, off-site storage presents an opportunity to decrease ISFSI-only sites and increase the number of facilities that can successfully terminate their licenses.

3. Security Risks of Spent Nuclear Fuel Storage

Another challenge of on-site storage is managing the security risks associated with holding radioactive materials. Nuclear power plants that were built before the September 11th terror attacks were built with an emphasis on safety rather than security, and the security measures taken after the attacks were ad hoc efforts.[66] Moreover, the SNF storage installations on-site are located outside of the reactor structure, and therefore many of the precautions involved in the construction of the reactor do not apply to SNF storage.

In 2002, the NAS Committee on Science and Technology for Countering Terrorism suggested that SNF should be moved to dry cask storage.[67] Dry cask storage is more mobile, reducing risk in transport and allowing more ability to move casks to new locations or to a permanent repository if one is ever established.[68] Additionally, SNF stored in casks causes less corrosion than in wet storage, and less SNF is at risk in an accident.[69] Further, SNF leakages are easier to solve

62. *Id*.

63. *Decommissioning Nuclear Reactors is a Long-term and Costly Process*, U.S. ENERGY INFORMATION ADMINISTRATION (Nov. 2017), https://www.eia.gov/todayinenergy/detail.php?id=33792 [https://perma.cc/69RE-PGLY].

64. *Locations of Power Reactor Sites Undergoing Decommissioning*, UNITED STATES NUCLEAR REGULATORY COMMISSION, https://www.nrc.gov/info-finder/decommissioning/power-reactor/index.html [PDF on file with the Columbia Journal of Environmental Law] (last visited Feb. 24, 2024).

65. *Nuclear Reactor Shut Down List*, U.S. ENERGY INFORMATION ADMINISTRATION, https://www.eia.gov/nuclear/reactors/shutdown/ [https://perma.cc/9Z8X-UFV2].

66. Richard B. Stewart & Jane B. Stewart, *Solving the Spent Fuel Impasse*, 21 N.Y.U. ENVTL. L.J. 1, 34 (2014).

67. *Id.*

68. LUIZ SERGIO ROMANATO, ADVANTAGES OF DRY HARDENED CASK STORAGE OVER WET STORAGE FOR SPENT NUCLEAR FUEL (2011), https://www.osti.gov/etdeweb/servlets/purl/21513676 [https://perma.cc/X3CU-Z9E7].

69. *Id*. at 8.

when stored in casks than in wet storage.[70] One of the benefits of *new* interim storage installations, such as those at issue in *Texas v. NRC*, is that they feature dry cask storage, and they can be built to contemplate security measures that were not emphasized when building the reactor sites.[71] Although the NRC rejected the NAS Committee's recommendation,[72] they took other steps to strengthen security measures for the existing nuclear sites. The scope of these measures includes not just production and utilization facilities, such as the reactor, but also independent spent fuel storage installations.[73] More discussion on the security risks of SNF storage is provided in Part II(B)(4) regarding the NRC's Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel.

4. NRC Licensing and Waste Confidence Rulings

As decades progressed without any progress on a permanent repository, SNF remained on-site in supposedly temporary storage for far longer than originally anticipated, requiring expanded storage pools and SNF to be packed more densely within such pools.[74] That practice led to uncertainty as to the safety and environmental effects of continued on-site SNF storage in the face of requests for license amendments. In the 1979 *Minnesota v. NRC* decision, the D.C. Circuit required the NRC to make findings as to the possibility of an off-site disposal solution being available by the expiration of the at-issue plant's operating licenses, and whether the SNF could be stored safely on-site beyond those dates.[75] These findings were allowed to be in the form of "generic determinations," which did not need to be site-specific.[76] The NRC reported its findings in the first "waste confidence decision" (WCD) in 1984.[77] The WCD allowed for continued SNF storage beyond the operational license of the nuclear power plants. Broadly, WCDs are important both to continually monitor the risk of

70. *Id.* at 8.

71. *See* Waste Control Specialists LLC Application for a License for a Consolidated Interim Spent Fuel Storage Facility, USNRC Docket No. 72-1050 (2018); *see also* Holtec International HI-STORE CIS (Consolidated Interim Storage Facility) License Application, USNRC Docket No. 72-1051 (2017).

72. Timothy Cama, *Feds Reject Call to Move Spent Nuclear Fuel*, THE HILL (May 28, 2014), https://thehill.com/policy/energy-environment/207371-feds-reject-call-to-move-spent-nuclear-fuel/ [https://perma.cc/7G3B-9PWM].

73. 10 C.F.R. § 73.1(b)(6).

74. New York v. Nuclear Regul. Comm'n, 681 F.3d 471, 474 (D.C. Cir. 2012).

75. Minnesota v. Nuclear Regul. Comm'n, 602 F.2d 412, 419 (D.C. Cir. 1979).

76. *Id.* at 416.

77. *New York v. Nuclear Regul. Comm'n*, 681 F.3d at 475.

SNF storage and buildup, and to provide sound regulatory authority for the NRC's continued licensing, as required by *Minnesota v. NRC*.

The National Environmental Policy Act (NEPA) requires federal agencies to prepare environmental impact statements before taking "major federal action," however, these statements can be avoided if the agency conducts an environmental assessment and makes a "Finding of No Significant Impact."[78] In 2010, the NRC released its amended WCD that still concluded that a permanent repository would have "No Significant Impact" and would be available "when necessary."[79] The D.C. Circuit pointed to the continued failure of the federal government to establish such a repository as evidence against the NRC's "Finding of No Significant Impact" and instructed the NRC to conduct a more thorough analysis than in its 2010 WCD to include the potential environmental impacts of continued on-site storage without a permanent repository.[80] In 2014, the NRC released its Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel (GEIS).[81] The GEIS assessed the "technical feasibility and environmental impacts of safely storing spent fuel beyond the licensed life for operations of a nuclear power plant."[82] The GEIS was incorporated into 10 C.F.R. 51.23, allowing license amendment proceedings to not require site-specific assessments of environmental and security risks of continued SNF storage.[83]

Nonetheless, the GEIS has limitations. When creating its GEIS, the NRC undertook what it called "probabilistic risk assessment."[84] The NRC looked to the context (the setting in which effects will occur) and intensity (severity of impact in whatever context it occurs) of environmental impacts in coming to its conclusions.[85] Of particular concern was the possibility of terrorist attacks on such facilities. Although the NRC generally found that the resultant intensity of such an attack on an SNF storage site was incredibly high, it deemed the probability of such attacks sufficiently low not to interfere with their current waste confidence rules. After the September 11th attacks, the NRC reviewed its security policies and promulgated requirements for increased security measures associated with access authorization, fitness for duty,

78. *Id.* at 476.
79. Waste Confidence Decision Update, 75 Fed. Reg. 81037-01 (Dec. 23, 2010).
80. *New York v. Nuclear Regul. Comm'n*, 681 F.3d at 479.
81. *See generally* GEIS, *supra* note 44.
82. *Id.* at § ES.1 xxiii. Incorporated in 10 C.F.R. § 51.23.
83. *See* 10 C.F.R. § 51.23; GEIS, *supra* note 44, at 1-6.
84. *See generally* GEIS, *supra* note 44.
85. GEIS, *supra* note 44, at 1-23.

and behavior observation; however, the details of ISFSI licensees' compliance with these compensatory measures are withheld from the public for security reasons.[86]

In response, courts are divided as to when or if the NRC needs to conduct environmental assessments of terrorist attacks in their generic analyses. In 2006, the Ninth Circuit held that the NRC's conclusion that the probability of a terrorist attack was "unquantifiable" did not eliminate the need to assess such a risk.[87] So long as the risk of a terrorist attack was "not insignificant," NEPA obligates the NRC assess the environmental consequences of that risk.[88] In 2009, the Third Circuit ruled that even if such a risk is "unquantifiable," if the NRC nevertheless characterizes such a risk as "small" then the NEPA process is satisfied.[89] Further, relying on the Supreme Court's decision in *Metropolitan Edison*, the court concluded that the NRC was not obliged to consider the risk of terrorist attacks because agencies are only required to assess "direct effects, which are caused by the action and occur at the same time and place," or, "indirect effects, which are caused by the action . . . ."[90] The Third Circuit concluded that any risk of terrorism would be neither a direct nor indirect effect of the NRC's action.[91] Finally, for the avoidance of doubt, the court found that the NRC had already considered the risk of terrorist attacks and concluded that the effects of a terrorist attack would be "no worse" than the effects of other accidents.[92] Of note, the most recent generic analysis on nuclear waste storage found that the probability of a terrorist attack was "small" but also "unquantifiable."[93] However, various terrorist attacks on electrical substations should warrant a reconsideration of this legal issue.[94]

86. GEIS, *supra* note 44, at 2-11.

87. San Luis Obispo Mothers for Peace v. Nuclear Regul. Comm'n, 449 F.3d 1016, 1032 (9th Cir. 2006).

88. *Id*.

89. New Jersey Dep't of Env't Prot. v. U.S. Nuclear Regul. Comm'n, 561 F.3d 132, 143 (3d Cir. 2009).

90. *Id.* at 138 (quoting Metro Edison Co. v. People Against Nuclear Energy, 460 U.S. 766, 774 (1983).

91. *Id.* at 139.

92. *Id.* at 136.

93. GEIS, *supra* note 44, at § 4.19.1.

94. Michael Levenson, *Attacks on Electrical Substations Raise Alarm*, N.Y. TIMES (Feb. 4, 2023), https://www.nytimes.com/2023/02/04/us/electrical-substation-attacks-nc-wa.html [https://perma.cc/9XKZ-34H4].

C. The Permian Basin Controversy

In 2016, Waste Control Specialists LLC initiated a licensing procedure with the NRC,[95] later joined by Interim Storage Partners LLC, to construct and operate a consolidated interim storage facility at an away-from-reactor site in the Permian Basin of Andrews County, Texas.[96] After the NRC published notice of the application in the Federal Register and invited parties to intervene, several parties took up the NRC's invitation, arguing various violations of the National Waste Policy Act (NWPA), the National Environmental Policy Act (NEPA), and other procedural deficiencies.[97] The NRC's Atomic Safety and Licensing Board denied each concern, and the NRC affirmed these denials. The D.C. Circuit took up the case in January of 2023.[98] The court found, in an unpublished opinion, that the parties did not have standing to hear most of the claims and found the rest meritless.[99]

Around the same time, Holtec International began a similar proceeding to construct a spent nuclear fuel storage facility in Southeast New Mexico.[100] Challenges to the Holtec facility made their way to the Tenth Circuit Court of Appeals in February of 2023. The Tenth Circuit ruled on the issue with respect to the Hobbs Act,[101] which creates federal appellate jurisdiction over the NRC's final orders.[102] For reasons not relevant to this Note, the Tenth Circuit ruled that the parties did not have standing under the Hobbs Act.[103] Despite finding a lack of standing for similar reasons that the D.C. Circuit ruled, the Tenth Circuit proceeded beyond the D.C. Circuit's ruling. The court expressly stated that the NRC has the authority to license the private use of facilities to store spent nuclear fuel.[104] Moreover, it dispelled New

95. Waste Control Specialists LLC Application for a License for a Consolidated Interim Spent Fuel Storage Facility, USNRC Docket No. 72-1050 (2018).

96. Interim Storage Partner's Waste Control Specialists Consolidated Interim Storage Facility, 83 FR 44070-01.

97. Don't Waste Michigan v. U.S. Nuclear Regul. Comm'n, No. 21-1048, 2023 WL 395030, 1–2 (D.C. Cir. Jan. 25, 2023).

98. *Id.* at 2.

99. *Id.* at 3.

100. Holtec International HI-STORE CIS (Consolidated Interim Storage Facility) License Application, USNRC Docket No. 72-1051 (2017).

101. New Mexico *ex rel.* Balderas v. United States Nuclear Regul. Comm'n, 59 F.4th 1112, 1115 (10th Cir. 2023).

102. 28 U.S.C. § 2342(4) (Section 2342(4) refers to the "Atomic Energy Commission," which was replaced by the NRC. Final orders are defined under 42 U.S.C. § 2239)

103. *Balderas*, 59 F.4th at 1117 (the reasons relate to New Mexico's lack of requisite participation in the official proceeding).

104. *Id.* at 115–16.

Mexico's challenge based on the NWPA. The court held that because the storage was "private" and "interim," the NRC's authority to issue the license stemmed from the AEA and therefore a challenge based on the NWPA was meritless.[105]

Later, in August of 2023, the challenges to the Andrews County, Texas facility reached the Fifth Circuit Court of Appeals. This time, petitioners received the judgment they hoped for. The Fifth Circuit made two determinations that prohibited the licensing of private interim SNF storage by the NRC. First, the court ruled that the three types of nuclear material enumerated in the AEA were "constituent materials" of SNF.[106] This is the same language used in other cases that ultimately validated the NRC's licensing authority,[107] but in this case the court looked to the enumerated uses for licenses under the AEA and found that none encompassed storage or disposal of highly radioactive material like SNF.[108] The Fifth Circuit reached this conclusion by looking at examples listed within AEA's definitional section, but strained to read in restrictions that the Act does not dictate. Next, the court ruled that the NWPA was a "comprehensive scheme to address the accumulation of nuclear waste," and therefore could not be reconciled with any NRC authority to issue licenses for private interim SNF storage.[109]

This ruling fails to acknowledge the context and limitations of the NWPA. The subsequent sections of this Note will address these points of contention in turn. Part III will provide support for the novel interpretation that SNF is included in the term "byproduct" under the AEA's definitional section. Part IV will show that licensing private off-site storage of byproduct material is an enumerated use under the AEA. Part V will argue that the NWPA does not have the purpose or effect of superseding the NRC's granted authority under the AEA and that the newly developed major questions doctrine should not apply to this question.

A fourth challenge on the issue of private off-site spent nuclear fuel storage facilities is presented through challenges to New Mexico facility in the D.C. Circuits.[110] Oral arguments were held on March 6, 2024.

105. *Id.* at 1122.

106. Texas v. Nuclear Regul. Comm'n, 78 F.4th 827, 840 (5th Cir. 2023).

107. *See* Bullcreek v. Nuclear Regul. Comm'n, 359 F.3d 536 (D.C. Cir. 2004).

108. *Texas v. Nuclear Regul. Comm'n*, 78 F.4th at 841.

109. *Id.* at 842–44.

110. Brief for Petitioner, Beyond Nuclear, Inc. v. United States Nuclear Regulatory Commission, 113 F.4th 956 (D.C. Cir. 2024) (No. 20-1187).

The Supreme Court granted certiorari to potentially resolve the circuit split on October 4, 2024.[111]

III. SPENT NUCLEAR FUEL QUALIFIES AS "BYPRODUCT MATERIAL" UNDER THE ATOMIC ENERGY ACT

This Part first examines the structure and mechanics of the AEA, specifically with respect to the three enumerated material classifications that dictate the NRC's authority, ultimately concluding that the plain text of the AEA includes SNF as a "byproduct material." Next, it examines the various ways courts have assessed the question, ultimately finding that no appellate courts have included SNF as a "byproduct material" under the AEA despite incidentally finding the NRC's authority to license private, off-site SNF storage facilities.

A. The Atomic Energy Act and Spent Nuclear Fuel

The AEA put licensing authority for the commercial use of all activities involving nuclear waste squarely within the purview of the NRC. Congress explicitly declared its intention of "strengthen[ing] free competition in private enterprise"[112] within the nuclear industry, and the NRC was listed as the sole licensor of effectuating that policy within the Act.[113] Courts, including the Supreme Court, have routinely held since the passage of the AEA that the NRC has exclusive authority over radioactive materials related to nuclear energy. In 1976, the Supreme Court ruled on *Train v. Colorado Public Interest Group*, which involved a question of split authority between the Environmental Protection Agency (EPA) and the NRC. The Federal Water Pollution Control Act gave EPA authority to regulate the discharge into the Nation's waterways, and the term "pollutant" in the Act was defined to include "radioactive materials."[114] The court held, however, that these "radioactive materials" were "those not encompassed in the definition of source, byproduct, or special nuclear materials as defined by the Atomic Energy Act of 1954."[115] Source, byproduct, and special nuclear materials are the three enumerated types of radioactive material

111. Greg Stohr, *Nuclear Waste Storage Site in Texas Draws Supreme Court Review*, BLOOMBERG LAW (Oct. 4th, 2024), https://news.bloomberglaw.com/environment-and-energy/nuclear-waste-storage-site-in-texas-draws-supreme-court-review [PDF on file with the Columbia Journal of Environmental Law].

112. 42 U.S.C. § 2011(b).

113. 42 U.S.C. §§ 2031–2041.

114. Train v. Colorado Pub. Int. Rsch. Grp, 426 U.S. 1, 7 (1976).

115. *Id.* at 11.

specifically delegated to the NRC in the AEA. The court ruled that the proper understanding of EPA's authority over "radioactive materials" consisted of authority over materials akin to "radium and accelerator produced isotopes,"[116] as those were not thought to be in the jurisdiction of the AEA at the time (until a later amendment to the AEA included Radium-226).[117]

Seven years later, in *Pacific Gas and Electric v. State Energy Resources Conservation & Development Commission*, a state utility challenged a California statute conditioning the construction of nuclear power plants on findings by state agencies that adequate storage facilities and means of disposal were available. The case dealt with a preemption challenge related to California's SNF storage requirements. The Supreme Court held that the NRC "was given the exclusive jurisdiction to license the transfer, delivery, receipt, acquisition, possession and use of nuclear materials."[118] Further, the court held that the federal government, which should be read as the NRC based on the AEA, "maintains complete control of the safety and 'nuclear' aspects of energy generation."[119] The Supreme Court explained that the NRC has licensing jurisdiction over the "transfer," "possession," and "use" of nuclear materials and found SNF to be one example of such nuclear materials, indicating the Supreme Court has interpreted licensing authority for SNF to be exclusively within the jurisdiction of the NRC.[120] Although this case was decided in 1983, a 2019 three-Justice concurrence cited *PG&E*'s foundational holding approvingly, albeit not extensively, stating that the federal government—through the NRC—occupies "the entire field of nuclear safety concerns."[121] While a three-Justice concurrence is by no means authoritative, it does indicate a subset of the current Supreme Court's opinion of *PG&E*'s reasoning. Circuit courts have followed suit in recognizing the NRC's jurisdiction over SNF licensing, although using various methods to reach their conclusions.[122] These methods will be discussed further after an examination of the AEA's statutory definitions.

116. *Id*.

117. 42 U.S.C. § 2014. *See also Train*, 426 U.S. at 11.

118. Pac. Gas & Elec. Co. v. State Energy Res. Conservation & Dev. Comm'n, 461 U.S. 190, 207 (1983).

119. *Id*. at 212.

120. *Id.* at 190.

121. Virginia Uranium, Inc. v. Warren, 587 U.S. 761 (2019) (Ginsburg R., concurring).

122. *See* Part III(C).

B. The Atomic Energy Act's Three Enumerated Radioactive Materials

As mentioned above, the AEA provides the NRC licensing authority over three defined categories: source material, special nuclear material, and byproduct material. Each of these materials has corresponding allowable uses for which the NRC can license them. The AEA was designed to incorporate all materials related to nuclear energy, and such materials should usually be classified as one of the three. Source material generally includes raw materials that are extracted for downstream use, special nuclear material includes fissionable materials that can be used for nuclear reaction, and byproduct material can be thought of as radioactive waste and material produced in the process. Helpfully, Congress did not leave the definitions to the parsing of dictionaries and included specific definitions for each.

1. Source Material

Source material is defined at 42 U.S.C. § 2014(z) as uranium or thorium. Additionally, the NRC has the authority under Section 2091 to add materials to the definition. The Section 2091 process requires a determination that the material is "essential to the production of special nuclear material." SNF is at the tail end of the nuclear process and would not fit this definition. Further, the NRC has not undergone a process under Section 2091 to add SNF to the definition of source material, and therefore the NRC would not have authority over it under Section 2014(z).

2. Special Nuclear Material

Special nuclear material is defined in 42 U.S.C. 2014(aa) to include "plutonium [and] uranium enriched in the isotope 233 or in the isotope 235," as well as other material the NRC adds through the process listed in Section 2071. For the NRC to add a material pursuant to Section 2071, the NRC must first find that the material is "capable of releasing substantial quantities of atomic energy." The NRC defines "fissile material" as uranium-233, uranium-235, and plutonium-239,[123] matching the materials enumerated in the AEA's definition section.[124]

123. *Fissile Material*, UNITED STATES NUCLEAR REGULATORY COMMISSION (Mar. 2021), https://www.nrc.gov/reading-rm/basic-ref/glossary/fissile-material.html [https://perma.cc/LT4A-6VAY].

124. 42 U.S.C. § 2014(aa).

While NRC's informational definitions do not hold legal weight, these definitions and their correlation to enumerated materials, combined with the requirement under Section 2071 that the material is capable of releasing substantial atomic energy, imply that special nuclear material essentially only includes fissile materials. Nuclear fuel has a useful life of three to six years, after which it can no longer be used to create nuclear energy.[125] SNF comprises less than 1% fissile uranium-235 and about 1% fissile plutonium, and while that small percentage of uranium-235 and plutonium can be reused, it requires reprocessing in order to once again be useful as special nuclear material.[126] Natural uranium (a source material under 42 U.S.C. § 2014(z)) would not be considered special nuclear material despite containing about 0.7% uranium-235 (the rest being uranium-238).[127] In the same way, spent nuclear fuel cannot be considered special nuclear fuel just because it contains small amounts of uranium-235 and plutonium.

3. Byproduct Material

Byproduct material is defined more extensively in the AEA than the two previously discussed material types, and it includes SNF under AEA Section 2014(e)(1). Rather than providing examples, the statute provides characteristics which proscribe three avenues for inclusion as byproduct material. One possibility is under 42 U.S.C. § 2014(e)(2), which includes the waste produced by the extraction or concentration of source material. SNF is produced in the process of the creation of nuclear energy and this section would not apply. Section 2014(e)(3) includes radium-226 or material that has been made radioactive by the use of a particle accelerator. This section was added through the Energy Act in 2005,[128] and was included due to the risk of a "dirty bomb."[129] SNF could likely not be construed as a byproduct material under Section 2014(e)(3).

SNF is included, however, in 42 U.S.C. § 2014(e)(1), which reads, in relevant parts, "any radioactive material (except Special Nuclear Material) yielded in . . . the process of . . . utilizing Special Nuclear

125. INTERNATIONAL ATOMIC ENERGY AGENCY, GETTING TO THE CORE OF THE NUCLEAR FUEL CYCLE FROM THE MINING OF URANIUM TO THE DISPOSAL OF NUCLEAR WASTE 6, https://www.iaea.org/sites/default/files/18/10/nuclearfuelcycle.pdf [https://perma.cc/ZW9B-ZNBC].

126. *Id*. at 7.

127. *Id*.

128. Energy Policy Act of 2005, 42 U.S.C. § 13201 (2005).

129. S9335 Energy Policy Act of 2005-Conference Report, 151 Cong. Rec. S9335-01 (2005).

Material." As mentioned, special nuclear material includes fissile materials that can be used to release atomic energy. Although utilization is not defined within the AEA, utilization facilities are defined under 42 U.S.C. § 2014(cc) to include any equipment or device "peculiarly adapted for making use of atomic energy." Naturally, a nuclear power plant would be considered "peculiarly adapted for making use of atomic energy," and courts have confirmed this understanding.[130] It follows, then, that the activities undergone by these utilization facilities in the manner contemplated by their granted status as a utilization facility, would be "utilization" for the purposes of 42 U.S.C. § 2014(e)(1).

In summary, radioactive material (which SNF is) yielded in the utilization of special nuclear material is "byproduct material." SNF is created by the change in chemical composition undergone through use of special nuclear material in a nuclear reactor. The plain text therefore indicates that SNF should fit well within the byproduct material definition under 42 U.S.C. § 2014(e)(1). While most courts have ruled that SNF is covered within the NRC's jurisdiction, how they reach that conclusion is more than a semantic matter, as each of the above categories of nuclear-related material has its own corresponding allowable uses for licensing purposes. These enumerated uses are discussed in Part IV.

C. United States Courts' Classifications of Spent Nuclear Fuel

Although the statute's plain language seems to incorporate SNF into "byproduct material," no appellate courts have ruled in such a way. This section examines the various methods appellate courts have used to find NRC licensing authority over SNF under the AEA. The Fifth Circuit's ruling in *Texas v. NRC* held that special nuclear material, source material, and byproduct material are "constituent materials of spent nuclear fuel," distinguishing SNF from covered materials, supporting their contention that the at-issue licenses were invalid.[131] This language is borrowed from *Bullcreek v. Nuclear Regulatory Commission*, a 2004 case from the D.C. Circuit ironically coming to the exact opposite conclusion.[132] *Bullcreek* cited a string of court cases including

130. *See* Jersey Cent. Power & Light Co. v. Twp. of Lacey, 772 F.2d 1103 (3rd Cir. 1985) ("Oyster Creek is a nuclear power plant and a federally licensed "utilization facility" as defined by the Atomic Energy Act of 1954."); *see also* Public Service Co. of New Hampshire v. U.S. Nuclear Regulatory Comm'n, 582 F.2d 77 (1st Cir. 1978).

131. Texas v. Nuclear Regul. Comm'n, 78 F.4th 827, 840 (5th Cir. 2023)

132. Bullcreek v. Nuclear Regul. Comm'n, 359 F.3d 536, 538 (D.C. Cir. 2004).

Pacific Gas and Electric to support its contention that "[w]hile the AEA does not specifically refer to the storage or disposal of spent nuclear fuel, it has long been recognized that the AEA confers on the NRC authority to license and regulate the storage and disposal of such fuel."[133] The issue is that neither *Bullcreek* nor any of the cases cited to support its conclusion provide convincing—or any—statutory analysis to support *Bullcreek*'s holding.

Outside of *Bullcreek*, other courts have also reached this conclusion in different ways, including, chronologically: the Seventh Circuit, the Supreme Court, the Third Circuit, the D.C. Circuit, the Tenth Circuit, and the Ninth Circuit. While all arrive to the conclusion that NRC has licensing authority over private off-site SNF storage, three categorize SNF as all three enumerated materials within the AEA, one categorizes SNF as special nuclear material, one mentions that SNF is a byproduct of nuclear reactors without actually holding that SNF is a byproduct material under the AEA, and, perhaps most importantly, the Supreme Court does not attempt to incorporate SNF into any of the AEA's enumerated materials. How SNF is classified is crucial to the NRC's licensing authority, as each enumerated material has distinct authorized uses, as will be discussed in Part IV.

1. The Seventh Circuit

To begin, the first circuit court to address how SNF fits within the AEA was the Seventh Circuit in *Illinois v. General Electric*.[134] This controversy involved a preemption issue where Illinois sought to enjoin a state utility from shipping SNF into Illinois and the owner from receiving it. At this point in history, General Electric's facility was the only existing off-site SNF storage facility in the United States,[135] a fitting starting point for this discussion. This ruling contained what would become the cataclysmic quote used in subsequent cases that "[t]he Act does not refer explicitly to spent nuclear fuel, but it does refer to the constituents of that fuel."[136] This statement cited to the definitional sections of the three materials (42 U.S.C. §§ 2014(e), (z), (aa)), but provided no analysis on how they reached that statutory conclusion, nor why § 2014(e) (defining byproduct materials) did not apply on its own.

133. *Id.*
134. People of State of Ill. v. Gen. Elec. Co., 683 F.2d 206 (7th Cir. 1982).
135. *Id.* at 208.
136. *Id.* at 214.

The Seventh Circuit further concluded that because the AEA referred to SNF through its inclusion of its "constituent materials," the states could not question NRC's authority to regulate the storage of SNF.[137] The reasoning as to why the states could not question NRC's authority rested on Sections 2073 and 2111, two of the enumerated uses sections that relate to the specific material. As will be explained in Part IV, Section 2073 is much more restrictive than Section 2111, and NRC likely does not have the authority to issue licenses for private interim storage under Section 2073. Nevertheless, some courts began to take up this language in future cases, although others found different reasonings to come to the same conclusion.

2. The Supreme Court

The next Court to take up the issue of SNF was the Supreme Court a year later in the aforementioned *Pacific Gas and Electric* case (1983).[138] Similar to *General Electric*, this particular case involved a preemption challenge but also touched on NRC's authority to license SNF for storage. Although the "constituent materials" language was already amid the appellate courts after the Seventh Circuit case, the Supreme Court opted not to use this language. Instead, the Court looked to the overall purpose of the AEA as amended in 1954 to conclude Congress intended the federal government, through the NRC, to "regulate the radiological safety aspects involved in the construction and operation of a nuclear plant,"[139] which would appear to include rules for SNF storage that were at issue in *Texas v. NRC* but does not explicitly do so. The Supreme Court left the issue of SNF's connection with the AEA for future appellate courts.

3. The Third Circuit

Two years later, in 1985, the Third Circuit had a chance to weigh in on the issue in yet another preemption case. In *Jersey Central Power & Light v. Lacey*,[140] a state utility attempted to get the court to find a township ordinance prohibiting importation of nuclear waste unconstitutional. Unlike the previous two cases, the Third Circuit's ruling

137. *Id.* at 214–15 (although the court came to this conclusion, they held for Illinois on the basis of the Clean Air Act, rather than the AEA).

138. Pac. Gas & Elec. Co. v. State Energy Res. Conservation & Dev. Comm'n, 461 U.S. 190 (1983).

139. *Id.* at 205.

140. Jersey Cent. Power & Light Co. v. Twp. of Lacey, 772 F.2d 1103 (3rd Cir. 1985).

concluded that special nuclear material is a "classification which encompasses spent nuclear fuel."[141] This presented a third option for relating SNF to the AEA. The court cites only the definitional statute of special nuclear material under Section 2014(aa). In the very next sentence, the Third Circuit explains that fuel for nuclear reactors "becomes depleted after a few years in the reactor and has to be replaced," explicitly mentioning uranium-233 and uranium-235.[142] But simply because a material once was one of the examples of special nuclear fuel does not mean it always will be.

Section 2071 provides guidelines for when the NRC can determine a material to be special nuclear material, and it gives insights as to what Congress had in mind when defining special nuclear fuel. To be special nuclear material, the NRC must conclude that the material is capable of releasing atomic energy. However, the reason that SNF "has to be replaced," to borrow the courts verbiage, is that over time, SNF becomes no longer fissile and thereby no longer capable of releasing enough atomic energy to be used. Although it may be possible to reuse SNF through reprocessing, as was originally intended in the twentieth century, the fact that it must be reprocessed to extract fissile materials showcases that it should no longer be considered special nuclear fuel under the AEA.[143] Regardless, this case added to the growing array of reasoning to find the NRC's authority over SNF.

4. The D.C. Circuit and the Tenth Circuit

The next court to deal with the issue was the D.C. Circuit in *Bullcreek v. Nuclear Regulatory Commission* in 2004.[144] This is the case most directly confronted by the Fifth Circuit in *Texas v. NRC*. *Bullcreek*, as it was the first case to squarely address how the NWPA fit into the puzzle of private interim storage. Part V of this Note contains discussion of the NWPA, and for the moment the discussion will be constrained to how the Court interpreted the AEA. As mentioned above, the D.C. Circuit was the second circuit court to utilize the "constituent materials" argument that first arose in *General Electric*, and cited the first three cases mentioned in this section. Notably, in its own initial ruling, before the controversy made it to the Article III Courts, the NRC

141. *Id.* at 1105.

142. *Id*.

143. *Processing of Used Nuclear Fuel*, WORLD NUCLEAR ASSOCIATION (Dec. 2020), https://world-nuclear.org/information-library/nuclear-fuel-cycle/fuel-recycling/processing-of-used-nuclear-fuel.aspx [https://perma.cc/8Z3J-4LFB].

144. Bullcreek v. Nuclear. Regul. Comm'n, 359 F.3d 536 (D.C. Cir. 2004).

utilized the "constituent materials" argument as well.[145] The NRC's memorandum noted that the AEA authorizes the NRC to license "source, byproduct, and special nuclear materials regardless of their aggregate form," concluding that all three are found in SNF.[146] There is no discussion as to why SNF would not be considered a distinct "material" in its own right. There is no indication within the definitional section of the AEA that "material" by itself should only include distinct elements and isotopes, rather than a dictionary understanding of material as "the elements, constituents, or substances of which something is composed or can be made."[147] Regardless, after the NRC and the *Bullcreek* court used this language, the Tenth Circuit followed suit.

Six months after *Bullcreek,* also in 2004, the same controversy appeared in the Tenth Circuit.[148] In the opening paragraphs of the opinion, the court referred to its decision being "in light of the D.C. Circuit's recent resolution,"[149] and predictably reached the same conclusion on how the NRC derives its authority over SNF, citing *Bullcreek*'s language directly.[150]

5. The Ninth Circuit

One final classification comes from the Ninth Circuit in 2006. In *San Luis Obispo Mothers for Peace v. NRC*, the petitioner sought review of an NRC order approving a utility's application for an interim SNF storage installation, contending that the risk of terrorist attacks was not adequately considered by the NRC.[151] Although not a focus of the case, the Ninth Circuit described spent fuel as "the byproduct of the two nuclear reactors at that site."[152] While likely dicta or just a general description of what SNF is without regard to the AEA definitions, this classification comes the sentence after describing an application pursuant to 10 C.F.R. Part 72, the licensing process for SNF. Even if not a

145. Private Fuel Storage L.L.C., 67 Fed. Reg. 18253 (Nuclear Regul. Comm'n April 15, 2002).

146. Memorandum and Order from the United States Nuclear Regulatory Commission, Private Fuel Storage L.L.C., 6 (Dec. 2002), https://www.nrc.gov/reading-rm/doc-collections/commission/orders/2002/2002-29cli.pdf [https://perma.cc/QA8F-FFSX].

147. *Material*, MERRIAM-WEBSTER, https://www.merriam-webster.com/dictionary/material [https://perma.cc/9CMX-SXCW] (last visited Feb. 24, 2024).

148. Skull Valley Band of Goshute Indians v. Nielson, 376 F.3d 1223 (10th Cir. 2004).

149. *Id*. at 1227.

150. *Id*. at 1242.

151. San Luis Obispo Mothers for Peace v. Nuclear Regul. Comm'n, 449 F.3d 1016 (9th Cir. 2006).

152. *Id*. at 1021.

holding, the Ninth Circuit has been the only court to even remotely treat SNF as a byproduct material.

D. Summary

All of these analyses show the disarray that currently exists in the courts as to how to tie authority over SNF licensing into the AEA. Until August of 2023, there were no challenges to the NRC's authority to issue such licenses, so these differences did not warrant any substantial dispute. Now that there is a circuit split, not just on the process, but on the outcome, the reasoning of circuit courts begins to matter much more. Part IV explains exactly why that reasoning matters based on the authorized usage of licenses under the AEA.

IV. LICENSING PRIVATE OFF-SITE STORAGE OF BYPRODUCT MATERIAL IS AN ENUMERATED USE UNDER THE ATOMIC ENERGY ACT

This Part will explain how a material's classification under the AEA provides the NRC with varying authorities to issue licensing. First, an overview of the authorization statutes is provided with respect to each of the three enumerated materials. Second, the distinction between disposal and storage is explained, which was a material factor in *Texas v. NRC* and its holding that the AEA does not authorize licensing for private interim storage of SNF.

A. Authorizations to the NRC for Nuclear Materials

The AEA designates different sections of the statute authorizing the domestic distribution of each source, special nuclear, and byproduct materials. Likely due to each type's different viable uses, dangers, and threats, some sections provide more expansive licensing authority to the NRC than others. When courts rule that the NRC has authority over SNF in different ways, they can expand or retract the ability of the NRC to license SNF. Further, when a court treats SNF as an amalgamation of all three materials, presumably the most restrictive licensing ability would apply. Within this context, only the section on the domestic distribution of byproduct material allows for a license for private interim SNF storage.

1. Special Nuclear Material

License authorization for special nuclear material is likely the most restrictive of the three enumerated material types. The relevant

authority for the domestic distribution of special nuclear material comes from 42 U.S.C. § 2073. This section authorizes the NRC to issue licenses for special nuclear material in three circumstances.

The first circumstance is for research and development activities specified in 42 U.S.C. § 2051.[153] Section 2051 is for research and development and training activities in specified fields such as nuclear processes and atomic energy theory.[154] These contracts can be issued to those conducting research and development at private or public institutions or persons; however, Section 2051 refers to "the acquisition of an ever-expanding fund of theoretical and practical knowledge in such fields."[155] Commercial storage would not fit this use, and would need to be licensed for industrial or commercial purposes.

The next circumstance refers to Section 2134, which allows licenses for industrial and commercial purposes. However, this section only applies when the special nuclear materials are to be used "for utilization and production facilities for industrial and commercial purposes."[156] Production facilities refer to equipment or devices used to produce special nuclear material,[157] while utilization facilities are defined as equipment or devices capable of making use of special nuclear material, or "peculiarly adapted for making use of atomic energy."[158] Private interim storage sites would fit neither of these descriptions.

The final circumstance in which special nuclear material can be licensed is during interstate transport pursuant to cooperation agreements with foreign nations under Section 2153 or for production and utilization facilities.[159] This section also limits licenses to production and utilization facilities, so private storage installations would not be eligible.

This result can also be reasonably inferred from the verbiage of Section 2073(c)(2), which states that the NRC "shall" establish sales prices for the special nuclear material licensed. All special nuclear material must be paid for by the licensee. Private storage facilities only function economically if they are being paid to store the SNF, rather than paying the federal government for it. As such, the NRC would not have the authority to license private interim storage sites if SNF were classified as special nuclear material, implying that the Third Circuit's

153. 42 U.S.C. § 2073(a)(1).
154. 42 U.S.C. § 2051(a)(1), (2).
155. 42 U.S.C. § 2051(a).
156. 42 U.S.C. § 2134(b).
157. 42 U.S.C. § 2014(v).
158. 42 U.S.C. § 2014(cc).
159. 42 U.S.C. § 2073(a)(c).

reasoning in Part III(C)(3) would not allow the licensing of SNF for private storage facilities.

2. Source Material

The NRC is given licensing authority for domestic distribution of source material under 42 U.S.C. § 2093. This section largely mirrors the authorizations provided for special nuclear materials. The uses authorized under this section cross-reference Sections 2051, 2134, and 2133 in the same way that Section 2073 does, where only knowledge-driven research and development, medical uses, foreign cooperation agreements, use at a production or utilization site, or the transport to any of such are authorized.

One difference between authorizations for source material and for special nuclear material is that for the licensing of source material, the NRC only "may" charge licensees for material licensed *except* for those issued under Section 2133, which deals with commercial licenses.[160] As such, the same logical dilemma appears where an off-site storage facility would not pay the government for the SNF that it would be paid to store.

3. Byproduct Material

The relevant authority for the licensing of byproduct material comes from 42 U.S.C. § 2111. This section is noticeably broader in its allowances than the previous two sections. Instead of cross-referencing to Sections 2051, 2133, and 2134, Section 2111 is significantly more self-contained. The NRC can issue either general or specific licenses to applicants to use byproduct material for "research or development purposes, for medical therapy, industrial uses, agricultural uses, or such other useful applications as may be developed."[161] Unlike the other sections, there is no language confining "industrial uses" to production and utilization facilities. Therefore, private interim storage facilities are not initially barred from this section in the same way they were for source material and special nuclear material. The language of Section 2111(a) implies two routes to authorize the NRC's licensing for private storage sites.

First, the NRC is allowed to issue licenses for byproduct material for "industrial uses."[162] This term is left undefined within the AEA,

160. 42 U.S.C. § 2093(c).
161. 42 U.S.C. § 2111(a).
162. *Id.*

implying either that Congress wanted courts to take an expansive role in what that would entail or to look to common language. Industrial is defined as "of or relating to industry,"[163] while industry is defined as "a distinct group of productive profit-making enterprises."[164] The term "industrial usage" could then be understood to include the processes and practices that are general practice within the nuclear power industry. One of the essential characteristics of the nuclear industry is the waste that is produced and the inevitable process of storing SNF. This interpretation also allows for the profit-seeking aspect of both the power production industry and the burgeoning storage industry in tandem. If this understanding is adopted, the NRC would be authorized to issue licenses for private interim storage for industrial uses under Section 2111.

The second possibility is that Section 2111 authorizes licenses for "other useful applications as may be developed."[165] Unlike other sections of the AEA that provide a statutory procedure for the NRC to follow to incorporate other materials into definitions, Section 2111 provides no such process. This implies a greater degree of deference to the NRC on the part of Congress to make this kind of determination. Moreover, the AEA was created in the middle of the 20th century when the assumption was that SNF would eventually be reprocessed, rather than stored indefinitely.[166] As that assumption failed to come into effect, the country was left with the problem of figuring out where to store the growing stockpile of waste. Due to the new circumstances facing the NRC today in terms of SNF, combined with the considerable discretion that Congress seems to have presented the NRC within the statute, it would be reasonable for the NRC to read private interim storage as an industrial use for the "useful application" of freeing onsite storage capacity of nuclear operators.

The final point to show the coherence of this interpretation is that the entirety of the NRC's authority under this section can be undergone "with or without cost."[167] This presents a stark counterexample to the compensation requirements to the government for source material and special nuclear material. In the context of private storage, this would allow licenses to be issued without charges for the private

163. *Industrial*, MERRIAM-WEBSTER, https://www.merriam-webster.com/dictionary/industrial [https://perma.cc/Z9XT-4B6B] (last visited Feb. 24, 2024).

164. *Industry*, MERRIAM-WEBSTER, https://www.merriam-webster.com/dictionary/industry [https://perma.cc/3WHH-GG8R] (last visited Feb. 24, 2024).

165. 42 U.S.C. § 2111(a).

166. Stewart & Stewart, *supra* note 17.

167. 42 U.S.C. § 2111(a).

SNF, and then the storage capacity freely negotiated between reactor operators and storage companies, fulfilling the purpose of the AEA in "strengthen[ing] free competition in private enterprise" within the nuclear power industry.[168]

B. Spent Nuclear Fuel Storage is Distinct from "Disposal" Mentioned in 42 U.S.C. Section 2111

In *Texas v. NRC*, the Fifth Circuit points to 42 U.S.C. § 2111(b), which provides that byproduct material may only be transferred to and disposed of in a disposal facility that is "adequate to protect the public health" and licensed by the NRC.[169] The Fifth Circuit claims that Section 2111(b) specifies conditions under which byproduct materials may be disposed, and that because the byproduct material defined by 42 U.S.C. § 2014(e)(3) and (4) emits radiation for less time than SNF, SNF could not have been thought of as being within the authority of Section 2111 licensing agreements.[170] This argument overlooks two points.

First, the Fifth Circuit equated storage with disposal. Section 2111(b) speaks only of disposal, which would not include private storage licenses. The AEA leaves both storage and disposal undefined. However, other statutes in the United States Code have defined the term, including the NWPA. The NWPA defines "disposal" as "the emplacement in a repository of . . . spent nuclear fuel . . . with no foreseeable intent of recovery."[171] Additionally, the NWPA defines "storage" as "the retention . . . of spent nuclear fuel . . . with the intent to recover such waste or fuel for . . . disposal."[172] At issue in the current controversy is a private interim storage license that lasts for 40 years.[173] The licenses' temporal nature necessarily implies the intent to recover for disposal. Additionally, these licenses would not store SNF in a repository, but rather in dry casks, with the intent of recovery. While the contemporaneous lack of permanent disposal solutions after the Yucca Mountain project stalled may imply long storage periods, the storage is still attached to a finite time frame. Additionally, the NWPA's definition of "disposal" states that there is no foreseeable

168. 42 U.S.C. § 2011(b).
169. 42 U.S.C. § 2111(b).
170. Texas v. Nuclear Regul. Comm'n, 78 F.4th 827, 841 (5th Cir. 2023).
171. 42 U.S.C. § 10101(9).
172. 42 U.S.C. § 10101(25).
173. Waste Control Specialists LLC Application for a License for a Consolidated Interim Spent Fuel Storage Facility, USNRC Docket No. 72-1050 (2018).

"intent" of recovery, and its definition of "storage" states there is "intent" to recover the waste for disposal.[174] Whether the federal government can come up with a permanent solution or not does not alter the fact that there is very likely still intent to recover the waste for disposal.

There have been suggestions that the temporal nature attached to interim storage relates to the ultimate retrieval of that storage or the end of the license.[175] However, the Tenth Circuit rejected this argument in the unpublished case *New Mexico ex rel. Balderas v. United States Nuclear Regulatory Commission*, stating "though we don't know whether the government will complete a permanent repository, Interim Storage's license would remain temporary either way because of the forty-year term."[176] This argument was raised by the petitioners in *Texas v. NRC*, but the court did not address the issue in its ruling.[177]

The second overlooked point is section 2111(b)'s legislative history. Section 2111(b) only covers sections 2014(e)(3)–(4), which specify radium-226 and material made radioactive by a particle accelerator. Congress added those subparts, as well as section 2111(b) as a whole, to the AEA in the Energy Policy Act of 2005 because of worry that such materials could be used in a dirty bomb without NRC regulation.[178] The conference report of the Energy Policy Act also explains that Congress drafted section 2111(b) because the materials it covered, which were not previously regulated under the AEA, could be disposed of under other acts such as the Resource Conservation and Recovery Act, so long as their radioactivity levels were low enough.[179] Furthermore, the provisions were intended "to ensure that there [were] no new restrictions and no new authorities granted by this language."[180] When read in context of section 2111(b)'s legislative history, it is reasonable to assume that the additions referencing radium-226 and material made radioactive by a particle accelerator were only meant to apply to those categories of byproduct material

174. 42 U.S.C. § 10101(9); 42 U.S.C. § 10101(25).

175. Max Johnson, *Defining Interim Storage of Nuclear Waste*, 117 NW. U. L.REV. 1177 (2023).

176. New Mexico *ex rel.* Balderas v. United States Nuclear Regul. Comm'n, 59 F.4th 1112, 1122 (10th Cir. 2023).

177. Texas v. Nuclear Regul. Comm'n, 78 F.4th 827, 834 (5th Cir. 2023).

178. S. REP. NO. 9335-01, at 9349 (2005) (Conf. Rep.), 151 Cong. Rec. S9335-01, 2005 WL 1797575, at S9349.

179. *Id*.

180. *Id*.

without stripping the NRC of its preexisting authority over the broader category of byproduct material.

C. Summary

In short, the AEA grants the NRC authority to license private interim storage through Section 2111 based on the enumerated uses for by-product material. This authority can be derived either from the use of the term "industrial uses" or the catch-all providing the NRC with the discretion to evaluate an application. In addition, the recent Fifth Circuit decision incorrectly concluded that Section 2111(b) placed restrictions on the NRC's preexisting licensing authority over SNF. Now that the NRC's authority to license private interim SNF is established through the AEA, this Note turns to the Fifth Circuit's second major conclusion that the NWPA superseded the NRC's licensing authority over private interim storage licenses.

V. THE NUCLEAR WASTE POLICY ACT DOES NOT RESCIND OR SUPERSEDE THE NUCLEAR REGULATORY COMMISSION'S AUTHORITY TO ISSUE PRIVATE INTERIM STORAGE LICENSES

This Part will provide an overview of the NWPA and explain how it relates to the AEA. The next Section of this Part argues that the NWPA should be read as compatible with, rather than a limitation on, the AEA. Next, this Part will address some of the problematic contentions within the *Texas v. NRC* decision that read overly restrictive language into the NWPA. Finally, the Fifth Circuit's discussion on the major questions doctrine is assessed.

A. Overview of the National Waste Policy Act

The NWPA was the United States' first legislative attempt to solve the growing SNF problem in the country. The primary goal of the act was to establish repositories for the disposal of high-level radioactive waste and SNF, although the NWPA contained other supporting programs.[181] Primarily, the NWPA assigned the DOE with the responsibility of siting, building, and operating a permanent disposal repository for SNF. The DOE's activities were required to be licensed by the NRC. As mentioned earlier in this Note, the permanent repository site was eventually determined to be Yucca Mountain, but the project has

181. Nuclear Waste Policy Act of 1982, Pub. L. No. 97-425, 96 Stat. 2201 (1983) (as stated in the preamble).

effectively stalled for over a decade. The most substantive portion of the NWPA is Subchapter One, which deals with the disposal and storage of high-level radioactive waste, spent nuclear fuel, and low-level radioactive waste.[182]

Despite the current lack of effectuation, the Fifth Circuit in *Texas v. NRC* concluded that the NWPA superseded the NRC's authority to issue SNF storage licenses under the AEA. The fault in such a conclusion is discussed below.

1. Mechanics

Subchapter One of the NWPA contains three Parts that deal with SNF and are relevant to whether the NWPA was intended to displace the NRC's authority to license private storage facilities.

Part A is the conceptual crux of the NWPA and contains directives to the DOE and NRC for the permanent repository for SNF.[183] Part B gives owners and operators of civilian nuclear power reactors the primary responsibility of providing interim storage of SNF, utilizing existing on-site storage to the extent practical, and adding new on-site storage capacity where practical.[184] Additionally, the federal government was given the responsibility to provide capacity for interim storage of SNF where civilian reactors could not reasonably provide adequate on-site storage.[185] This requirement, however, came with the caveat that the federal government could not provide any more than 1,900 MTU of capacity for interim storage.[186] This capacity represents only around two percent of the 90,000 MTU of SNF that the United States currently has in storage.[187] Additionally, the requirement that the federal government only provide 1,900 MTU of additional capacity is only directed to the DOE rather than the NRC.[188] While the storage responsibility given to the DOE requires licensing approval by the

182. 42 U.S.C. §§ 10121–10175.
183. 42 U.S.C. §§ 10131–10145.
184. 42 U.S.C. § 10151(a)(1).
185. 42 U.S.C. § 10151(a)(3).
186. 42 U.S.C. § 10151(a)(3).
187. *Nuclear Waste Disposal*, U.S. GOV'T ACCOUNTABILITY OFF., https://www.gao.gov/nuclear-waste-disposal [https://perma.cc/WW9S-DP3V]; Mitch Jacoby, *As Nuclear Waste Piles up, Scientists Seek the Best Long-term Storage Solutions*, CHEM. & ENG'G NEWS (Mar. 30, 2020), https://cen.acs.org/environment/pollution/nuclear-waste-pilesscientists-seek-best/98/i12 [https://perma.cc/5RHL-CLTS].
188. 42 U.S.C. § 10155.

NRC,[189] the statute does not provide any additional authority, nor restrict existing authority, to the NRC.

Lastly, Part C of the NWPA Subchapter One discusses monitored "retrievable storage," a term circularly defined within the statute.[190] This section shows that Congress identified long-term storage of SNF in "monitored retrievable storage facilities" as an "option for providing safe and reliable management" of high-level radioactive waste and SNF.[191] The only affirmative directive given to the DOE was to conduct a detailed study on the need and feasibility of such a facility by 1985.[192] If such a facility was found to be feasible, it would need to be licensed by the NRC.[193]

Overall, Subchapter One of the NWPA provides the overarching requirement of a permanent repository at Yucca Mountain (a currently stalled program), puts the primary responsibility of SNF storage on civilian operators with on-site storage capacities, provides a limited measure for the DOE to aid such storage where on-site storage is not feasible, and provides a directive to the DOE for a study on a monitored receivable storage program. Nothing within the NWPA gives or negates the authority of the NRC. On the contrary, the repeated requirements that the NRC license all DOE activity represents a Congressional intent that the NRC retain the same licensing authority it had under the AEA. The only difference was that the NWPA extended the NRC's licensing authority over government activities now that the federal government was becoming involved in storage and disposal.

B. The National Waste Policy Act Should be Read as Compatible with the Atomic Energy Act

The Fifth Circuit ruled in *Texas v. NRC* that the comprehensive nature of the NWPA cannot be reconciled with the NRC's licensing authority under the AEA.[194] This reading inserts restrictions on the NRC that the NWPA does not impose. There are three reasons why this reading of the NWPA is implausible. First, the NWPA does not contain any exclusionary language toward the NRC, and in fact seems to expand the authority of the NRC to include both the private and public sector. Second, the Fifth Circuit overstates the comprehensiveness of

189. 42 U.S.C. § 10155(a)(1).
190. 42 U.S.C. §§ 10161–10169, 10101(34).
191. 42 U.S.C. § 10161(a)(1).
192. 42 U.S.C. § 10161(b)(1).
193. 42 U.S.C. § 10161(b)(2)(A).
194. Texas v. Nuclear Regul. Comm'n, 78 F.4th 827, 842 (5th Cir. 2023).

the NWPA in relation to the entirety of the nuclear industry. Lastly, the court misapplies 42 U.S.C. § 10151's limits on federal storage capacity to the case at issue.

1. The National Waste Policy Act does not Restrict the Nuclear Regulatory Commission's Licensing Authority

The NWPA is, essentially, a directive solely to the DOE. Parts A and B of the NWPA's Subchapter One create programs administered by the DOE. While these programs certainly encompass a wide array of duties, two aspects of the statute point to an expansion of the NRC's duties.

First, in the process of completing the DOE's assigned duties, licensing approval by the NRC is required at every step of the process. Prior to the NWPA, the NRC was the primary federal governmental body associated with the commercial nuclear power industry under the AEA. Both the AEA and case law have established that the NRC has authority over practically all aspects of nuclear power and its incidental radioactive materials.[195] Once the DOE took an affirmative role in SNF storage and disposal through the NWPA, the NRC's authority was expanded to include the licensing of the projects. Additionally, while the AEA does not speak to any authority of the NRC over SNF disposal (except through the post-NWPA 2005 amendments to solely include radium-226 and material made radioactive through a particle accelerator), the NWPA establishes NRC licensing authority over the Yucca Mountain disposal program.[196] In this way, the NWPA not only expands the NRC's jurisdiction as to *who* it licenses, but also as to *what* it licenses. The Fifth Circuit attempts to view this clear legislative expansion of authority as a restriction; however, the DOE is only being tasked to administer projects in the same way a commercial operator would administer its own storage programs. The NRC retains its exclusive licensing authority over all aspects of the nuclear power process.

The second aspect that points to an expansion rather than contraction of the NRC's licensing authority is through the parallel, yet distinct, aims of the AEA and the NWPA. The AEA represented the federal government's effort to privatize the nuclear power industry, focusing solely on how the NRC was to license and regulate the private sector.

195. *See, e.g.*, Pac. Gas & Elec. Co. v. State Energy Res. Conservation & Dev. Comm'n, 461 U.S. 190 (1983); Train v. Colorado Pub. Int. Rsch. Grp, 426 U.S. 1 (1976).

196. 42 U.S.C. § 10134(b).

In contrast, the NWPA almost entirely focuses on federal programs that should be seen as supplementing the existing activity of the private sector. To read otherwise would make it difficult to reconcile the NRC's authority over the DOE's facilities and the low capacity for SNF storage that the federal government could acquire under the interim storage plan of Part B.

The primary relationship between the NWPA and the private sector is 42 U.S.C. § 10151's requirement that persons owning and operating civilian nuclear power reactors have the primary responsibility for providing interim storage of SNF, and "to the extent practical" should maximize effective use of on-site storage. By directly placing the primary responsibility of SNF on private operators, Congress reiterated the NRC's authority under the AEA, which focused on the relationship between the NRC and these private operators and created licensing schemes for such activity. Additionally, the requirement of private operators providing on-site storage is filled with conditional words such as "to the extent practical" and the undefined use of "maximize" and "effective use."[197] There is also no language indicating who is to assess these conditional words, perhaps suggesting that the NRC should take Section 10151 into account when assessing license applications. Further, this suggests that Congress wanted to focus storage on-site, but ultimately contemplated, or even expected, that there would be a need for away-from-site storage. Where on-site storage is no longer "practical" or "effective," civilian owners and operators remain responsible for their SNF, and it would be reasonable for them to turn to the NRC's authority to license their SNF to away-from-site storage installations when available. A contrary reading would leave an extensive and absolute gap between what could be feasibly stored on-site and the federal 1,900 MTU capacity under the Federal Interim Storage Plan. The only way to fill this statutory puzzle is to conclude that the NRC retained its authority under the AEA to license away-from-site private storage facilities and that the flexible language of Section 10151 was intentional.

2. The Lack of Comprehensiveness of the National Waste Policy Act

The Fifth Circuit reads Part B and C together to conclude that Congress created a "comprehensive statutory scheme for addressing

197. 42 U.S.C. § 10151(a)(1).

spent nuclear fuel accumulation,"[198] and therefore NRC licenses to private interim storage facilities would run afoul of this scheme. This argument is implausible for two reasons.

First, Part C grants the DOE the authority to construct a monitored retrievable storage site but does not mandate its creation. The only mandatory language in Part C is the directive to provide a "detailed report" to its feasibility.[199] This does not imply the creation of a comprehensive scheme but rather the *possibility* of a more comprehensive federal scheme. It is a strained effort to read a directive to conduct a study as a restriction of power against another agency not mentioned in the statute, particularly when no such facility has been constructed thirty-three years after the deadline for such a study passed. Additionally, Part C contains no prohibitive language toward private sector storage. The only mention of private operators is the mandate that those operators would "pay the costs of the long-term storage" should it be used.[200] The storage facility at issue in the current controversy (disputed in *Texas v. NRC*) is private, and therefore Part C should not be read as a restriction to the NRC's authority to issue such a license.

The second issue in characterizing the NWPA as a comprehensive scheme is the low capacity placed on the Federal Interim Storage Plan in Part B. As mentioned, the DOE is only able to provide 1,900 MTU of storage capacity despite the fact that the United States currently has around 90,000 MTU of SNF in storage. Essentially, Parts B and C place the responsibility of SNF on the private operators while allowing federal supplements of only around 2% of the total SNF and directing the DOE to complete a study on the option of a monitored retrievable storage facility. Reading these directives as a comprehensive scheme that supersedes the statutory language of the AEA judicially revises Congressional intent and downplays the scope and severity of the state of SNF storage in the United States. The Court's effort to overturn the NRC's authority under the AEA also goes against the general statutory construction canon that repeals by implication are not favored.[201]

3. Misapplication of 42 U.S.C. Section 10151(a)(3)

The last issue in *Texas v. NRC* is the misapplication of the NWPA to the controversy in dispute. The Fifth Circuit ruled that because the

198. Texas v. Nuclear Regul. Comm'n, 78 F.4th at 844.
199. 42 U.S.C .§ 10161(b)(1).
200. 42 U.S.C. § 10161(a)(4).
201. *See, e.g.*, Rodriguez v. United States, 480 U.S. 522, 524 (1987).

proposed storage installation had a capacity of between 5,000 and 40,000 MTU, the 1,900 MTU federal capacity under Section 10151(a)(3) barred its licensing.[202] This conclusion similarly ignores the distinction between the public and private relationships of the AEA and NWPA. The NWPA, in its directive that the federal government provide supplemental interim storage, only allows up to 1,900 MTU of such capacity. In no way does this create a maximum capacity for storage among private-sector installations. In fact, the drastically higher capacity of this single private facility highlights the NWPA's shortcomings and the AEA's longevity. The NWPA was a federal supplemental solution to the rapidly growing SNF stockpile, and yet the entirety of the program allowed for just 1,900 MTU of capacity across the nation. In contrast, the AEA aimed to subject the market to free enterprise, and a single private storage facility can store over twenty times as much SNF.

Because the NWPA Part B capacity limit does not extend to the private sector, the Fifth Circuit's argument is immaterial to whether the NRC could issue a license for storage above 1,900 MTU. Further, based on the limits of the NWPA and the apparent ability of the private sector to accommodate excess SNF with away-from-reactor storage, this controversy exemplifies why the NRC needs to retain its authority to issue private away-from-reactor storage facilities in the face of an inadequate federal program through a workable, statute-based interpretation.

C. 42 U.S.C. § 10155(h) and *Bullcreek*

While not mentioned in *Texas v. NRC*, another contention that the NWPA superseded the NRC's authority under the AEA was brought to the D.C. Circuit in *Bullcreek v. NRC*.[203] The primary contention of the petitioners in this case was that 42 U.S.C. Section 10155(h) of the NWPA repealed the NRC's authority to license storage of SNF at private away-from-reactor facilities. The language reads in its entirety:

> Notwithstanding any other provision of law, nothing in this chapter shall be construed to encourage, authorize, or require the private or Federal use, purchase, lease, or other acquisition of any storage facility located away from the site of any civilian nuclear power reactor and not owned by the Federal Government on January 7, 1983.[204]

202. *Texas v. Nuclear Regul. Comm'n*, 78 F.4th at 843.
203. Bullcreek v. Nuclear Regul. Comm'n, 359 F.3d 536 (D.C. Cir. 2004).
204. 42 U.S.C. § 10155(h).

The petitioners viewed this provision's "notwithstanding" clause as eliminating prior authority allowing off-site storage. The NRC ruled, and ultimately the D.C. Circuit held, that Section 10155(h) had no effect on the NRC's preexisting authority. Part B is a directive to the DOE to establish a supplementary federal program for interim storage, and Section 10155 lays out the process for that storage program. The D.C. Circuit ruled that, read in light of Subtitle B of the NWPA, Section 10155(h) should be read solely as a restriction on the DOE's authority.[205] Limiting Section 10155(h) by providing "nothing in *this chapter* shall be construed to . . . authorize,"[206] only limits the effect of the authorization restriction to the governmental bodies given authority within the chapter: the DOE. The NRC receives its authority to license private off-site storage from the AEA, which is outside of the Chapter and, therefore, outside of the scope of Section 10155(h). In the NRC's words, Section 10155(h) should be read to "distinguish, not abrogate, existing provisions of law authorizing [away-from-reactor] spent fuel storage,"[207] and as a limitation on the DOE's authority under the NWPA's interim storage plan without reference to the NRC's preexisting authority.

An additional statutory construction problem appears when reading Section 10155(h) as abrogating the NRC's authority due to superfluous wording. If Section 10155(h) were purely a directive to governmental agencies, then there would be no need to include the additional words "encourage" or "require" since a lack of authorization makes them redundant. If off-site storage was not authorized, it would also be neither encouraged nor required. The NRC and the D.C. Circuit were able to interpret the statute in a way that would give each word meaning, following a traditional canon of statutory construction.[208] They read "not authorized" as a restriction on the NWPA's private interim storage plan, and not "encourag[ing] . . . or requir[ing]" as directed to civilian nuclear power operators, in that their responsibility to maximize on-site storage to the extent possible or expand on-site storage should not be construed as a requirement or encouragement that the operators use or take part in the federal interim storage plan.[209] This reading also lends support to the fact that the NWPA's

205. *Bullcreek*, 359 F.3d at 542.

206. 42 U.S.C. § 10155(h) (emphasis added).

207. *In re* Private Fuel Storage, 56 N.R.C. 390 (2002).

208. *See, eg.*, Williams v. Taylor, 529 U.S. 362, 364 (2000) ("Courts must give effect, if possible, to every clause and word of a statute.").

209. *Bullcreek*, 359 F.3d at 539.

interim storage program was designed to be a supplemental, rather than exclusive, program for SNF storage.

D. The Major Questions Doctrine

The final argument that the Fifth Circuit used is the relatively new major questions doctrine as it appeared in *West Virginia v. EPA*.[210] The doctrine is meant to analyze deference inquiries through the nature of the question presented, and "whether Congress in fact meant to confer the power the agency has asserted."[211] Moreover, Courts should consider whether there are "reasons to hesitate concluding that Congress meant to confer such authority."[212] The "economic and political significance" should be considered before granting new authority to federal agencies.[213] If that significance threshold is reached, the authorizing statute must show a "clear congressional authorization" to confer the newly interpreted authority.[214]

It is unclear what the threshold is for conferring enough significance to be subject to the major questions doctrine. While nuclear waste policy can be a hotly-contested political issue, it is unclear how much political significance can be placed on the distinction between private, off-site storage licensing as opposed to on-site storage. Much of the contentious nuclear debate seems to center on using nuclear reactors and establishing and locating a permanent geological repository instead. As for economic significance, there are very few private, off-site storage facilities in the United States, and the approval of the two currently under review by the NRC[215] will likely represent a small fraction of the total nuclear industry, much less the national economy. For those reasons, it is unclear why the major questions doctrine would apply in this case. Even if the major questions doctrine significance threshold is reached to allow for inquiry, the Fifth Circuit incorrectly ruled that the doctrine nullified the NRC's authority over private, off-site SNF licensing.

For one, the language of the AEA and lack of explicit removal of authority under the NWPA does seem to be a clear authorization on the issue. As such, it would bar any major questions doctrine analysis. The Fifth Circuit, for its part, also found the language to be

210. West Virginia v. EPA, 597 U.S. 697 (2022).
211. *Id*. at 721.
212. *Id*.
213. *Id*.
214. *Id*. at 723.
215. *See* Part II(C).

unambiguous; however, it reached the opposite conclusion.[216] Regardless, the Court claimed that even if the statute were ambiguous, it would not be entitled to deference purely due to the "economic and political significance" of the issue.[217]

The controversy at hand represents a major departure from the (albeit limited) applications of the doctrine. In *West Virginia v. EPA*, petitioners challenged a new EPA rule promulgated under the Clean Air Act that represented a recent fundamental shift in regulatory policy absent statutory modifications by Congress.[218] The EPA's new regulatory regime represented a "fundamental revision of the statute" changing one scheme of regulation "into an entirely different kind."[219] To begin, the cases in which the major questions doctrine has applied relate, at least implicitly, to *novel* alterations in regulatory policy and authority.[220] The overarching purpose of the doctrine is to prevent unilateral expansion or alteration of regulatory policy through statutes that lack "clear congressional authorization to do so," bucking traditional deference to agency interpretation in order to provide Congress the opportunity to legislate the issue.[221]

This overarching rationale necessarily implicates a temporal dimension to the doctrine's applicability, as longstanding interpretations have presumably given Congress ample time to respond to agency interpretation through corrective legislation. In the case of SNF, the NRC has exercised the same licensing authority under the AEA since 1954, and exercised licensing authority over SNF in the face of the NWPA since its effectuation in 1987. Appellate courts around the country, including the Supreme Court, have upheld the NRC's authority to license private interim storage for SNF for decades with no indication of disagreement or remedial action from Congress.[222] The only novelty presented by the issuance of these new licenses is the

216. Texas v. Nuclear Regul. Comm'n, 78 F.4th 827 (5th Cir. 2023).

217. *Id.* at 844.

218. West Virginia v. EPA, 597 U.S. 697 (2022). Note, agency deference is in a state of flux after the *Loper Bright* decision, however this Note aims to both provide statutory resolution as well as a response to the Fifth Circuit's recent decision in *Texas v. NRC*. As such, the legal status of agency deference is beyond the scope of this paper and will not be discussed. Loper Bright Enter. v. Raimondo, 603 U.S. 369 (2024).

219. *Id.* at 728.

220. *See* West Virginia v. EPA, 597 U.S. 697 (2022); *see also* Biden v. Nebraska, 143 S. Ct. 477 (2022).

221. KATE R. BOWERS, CONG. RSCH. SERV., IF12077, THE MAJOR QUESTIONS DOCTRINE (Nov. 2022), https://crsreports.congress.gov/product/pdf/IF/IF12077 [https://perma.cc/T9QE-FQGF]; *see also* Jonathan H. Adler, *Cato Supreme Court Review, West Virginia v. EPA: Some Answers About Major Questions* (Cato Sup. Ct. Rev., Rsch. Paper No. 2022-8, 2022).

222. *See* Part III(C).

fact that, unlike the existing nine privately-owned off-site ISFSIs (two off-site ISFSIs are owned by the Department of Energy in Idaho and therefore not at issue in the current controversy relating to privately owned ISFSIs),[223] there was never a nuclear power plant on site; all of the other off-site ISFSIs are at the site of a decommissioned nuclear reactor that was given its license in order to continue storing the spent fuel.[224] Private Fuel Storage, located in Utah and at issue in

223. *See* License for Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste, License No. SNM-2508, Docket No. 72-20 (Mar. 19, 1999); *see also* License for Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste, License No. SNM-2512, Docket No. 72-25 (Sept. 9, 2009).

224. The Maine Yankee facility in Maine is located at the site of the former Maine Yankee nuclear plant, which was retired in 1997. *See* AN INTERIM STORAGE FACILITY FOR SPENT NUCLEAR FUEL, MAINE YANKEE, https://maineyankee.com/docs/MaineYankee.pdf [https://perma.cc/8HLQ-RNNK] (last visited Mar. 13, 2024). The Yankee Rowe facility is located at the former location of Yankee Nuclear Power Station in Massachusetts, which ceased operations in 1992. *See* Yankee Atomic Electric Company; Yankee Rowe Independent Spent Fuel Storage Installation, Staff Evaluation; Exemption, 77 Fed. Reg. 60482 (Oct. 2, 2012). The Haddam Neck facility is located at the former site of the Haddam Neck Plant, which ceased nuclear generation in 1996, shrinking the site to just the ISFSI. *See* Memorandum from the Connecticut Yankee Atomic Power Company on Connecticut Yankee Atomic Power Company Haddam Neck Plant Independent Spent Fuel Storage Installation NRC License No. DPR-61 (NRC Docket No. 50-213) (Mar. 6, 2023), https://www.nrc.gov/docs/ML2308/ML23088A202.pdf [https://perma.cc/QLU6-BHS2]. The Big Rock Point facility in Charlevoix, Michigan used to be the site of a nuclear reactor that began commercial operations in 1963 and ceased operations in 1997. *See Big Rock Point*, UNITED STATES NUCLEAR REGULATORY COMMISSION, https://www.nrc.gov/info-finder/decommissioning/power-reactor/big-rock-point.html. [https://perma.cc/3DFG-VL4S] (last visited Mar. 13, 2024). The GE Morris facility in Illinois received its license for the storage of spent nuclear fuel in 1982. *See* License for Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste, License No. SNM-2500, Docket No. 72-1 (May 4, 1982). The site is adjacent to the Dresden Generating Facility, where one of its units was retired in 1978. *See Dresden – Unit 1*, UNITED STATES NUCLEAR REGULATORY COMMISSION, https://www.nrc.gov/info-finder/decommissioning/power-reactor/dresden-nuclear-power-station-unit-1.html [https://perma.cc/ZZ8V-BJUC] (last visited Mar. 13, 2024). The other two units are still operational. *See Dresden Nuclear Power Station, Unit 2*, UNITED STATES NUCLEAR REGULATORY COMMISSION, https://www.nrc.gov/info-finder/reactors/dres2.html [https://perma.cc/9MPE-WW5R] (last visited Mar. 13, 2024). *See also Dresden Nuclear Power Station, Unit 3*, UNITED STATES NUCLEAR REGULATORY COMMISSION, https://www.nrc.gov/info-finder/reactors/dres3.html [https://perma.cc/SV8M-ANQQ] (last visited Mar. 13, 2024). The Fort St. Vrain facility in Colorado is located at the site of the former Fort St. Vrain Nuclear Power Plant, which was operational from 1979 until 1989. *See Fort St. Vrain*, POWER REACTOR INFORMATION SYSTEM, INTERNATIONAL ATOMIC ENERGY AGENCY, https://pris.iaea.org/PRIS/CountryStatistics/ReactorDetails.aspx?current=623 [https://perma.cc/UP94-YV4K] (last visited Mar. 13, 2024). The ISFSI was built in 1989, and the Department of Energy assumed responsibility for the SNF and the license in 1996 and 1999, respectively. *See* DEPARTMENT OF ENERGY-MANAGED SPENT NUCLEAR FUEL AT FORT ST. VRAIN, U.S. NUCLEAR WASTE TECHNICAL REVIEW BOARD (Jun. 2020), https://www.nwtrb.gov/docs/default-source/fact-sheets/doe-snf-fact-sheet---fort-st-vrain-rev-1.pdf?sfvrsn=14. [https://perma.cc/89YA-HS63]. The Fort St. Vrain ISFSI was originally licensed in 1991, renewed in 2011, and set to expire in 2031. *See* License for Independent Storage of Spent Nuclear Fuel and High-level Radioactive

Bullcreek, received its license in 2006 (and still retains its license until 2026).[225] However, the facility never became operational.[226] In practice, the difference between storing SNF at a location that did or did not once have a nuclear facility does not present any material distinctions in terms of operations or licensing. Additionally, the licensing process contains no language indicating any difference between a facility that was once the site of a nuclear reactor and a site that has never been used for such a purpose.[227]

Further, a major questions inquiry requires explicit delegation as it would have been understood at the time of the statute's enactment,

Waste, License No. SNM-2504, Docket No. 72-09 (Jul. 18, 2011). The Trojan facility in Oregon is at the site of the former Trojan nuclear power plant, which was commercially operational from 1976 until Portland General Electric's decision to retire permanently and close the plant in 1993. *See Trojan Nuclear Site Spent Fuel Storage*, OREGON DEPARTMENT OF ENERGY, https://www.oregon.gov/energy/safety-resiliency/Pages/Trojan-Site.aspx [https://perma.cc/D3AW-6DQX] (last visited Mar. 13, 2024). The site received a license for its ISFSI in 1999, which was renewed in 2020 with an expiration in 2059. *See NRC Issues License to Portland General Electric for Storage of Trojan Fuel in Independent Storage Installation*, UNITED STATES NUCLEAR REGULATORY COMMISSION (Apr. 1, 1999), https://www.nrc.gov/reading-rm/doc-collections/news/1999/99-064.html [https://perma.cc/FQ6C-YNGF]. *See also* License for Independent Storage of Spent Nuclear fuel and High-Level Radioactive Waste, License No. SNM-2509, Docket No. 72-17 (Mar. 31, 1999). The Humboldt Bay facility in Eureka, California is located at the site of the Humboldt Bay nuclear power reactor, which had its operational license issued in 1962. *See Humboldt Bay*, UNITED STATES NUCLEAR REGULATORY COMMISSION, https://www.nrc.gov/info-finder/decommissioning/power-reactor/humboldt-bay-nuclear-power-plant-unit-3.html [https://perma.cc/6TA7-99U2] (accessed Mar. 13, 2024). The nuclear power plant was retired in 1976, and its operating license was officially terminated in 2021 after completing its decommissioning process. See *Humboldt Bay*, POWER REACTOR INFORMATION SYSTEM, INTERNATIONAL ATOMIC ENERGY AGENCY, https://pris.iaea.org/PRIS/CountryStatistics/ReactorDetails.aspx?current=599 [https://perma.cc/Z8HZ-Y7KA] (accessed Mar. 13, 2024). *See also Termination of Humboldt Bay Power Plant, Unit 3 Facility Operating License No. DPR-7*, UNITED STATES NUCLEAR REGULATORY COMMISSION (Nov. 18, 2021), https://www.nrc.gov/docs/ML2129/ML21295A250.pdf [https://perma.cc/Z8HZ-Y7KA]. The Humboldt Bay ISFSI received its storage license in 2005, which is set to expire in 2025. *See* License for Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste, License No. SNM-2514, Docket No. 72-27 (Nov. 2005). The Rancho Seco facility in Sacramento is located at the site of the Rancho Seco Nuclear Generating Station, which was retired in 1989 and its operating license amended to "possession only" status until official termination of the license in 2018. *See Termination of Rancho Seco Nuclear Generating Station Operating License DPR-54*, UNITED STATES NUCLEAR REGULATORY COMMISSION (Aug. 31, 2018), https://www.nrc.gov/docs/ML1808/ML18082B076.pdf [https://perma.cc/9L7A-Y8U6]. The site's ISFSI received license renewal in 2020 that is set to expire in 2060. *See* Sacramento Municipal Utility District; Rancho Seco Independent Spent Fuel Storage Installation, 80 Fed. Reg. 14,981 (Mar. 16, 2020).

225. License for Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste, License No. SNM-2513, Docket No. 72-22 (Feb. 2006).

226. COMMERCIAL SPENT NUCLEAR FUEL: CONGRESSIONAL ACTION NEEDED TO BREAK IMPASSE AND DEVELOP A PERMANENT DISPOSAL SOLUTION, UNITED STATES GOVERNMENT ACCOUNTABILITY OFFICE 15 (Sept. 2021).

227. *See* 10 C.F.R. § 72.

and courts consider whether the agency claiming authority is in an area of the expertise it had at the time of enactment.[228] Utilizing the major questions doctrine to dispel decades of precedent and regulatory action within its zone of expertise with no repudiation from Congress subverts the purpose of the doctrine.

Moreover, regardless of the temporal concerns invoking the major questions doctrine conjures, there does not appear to be a regulatory policy shift. The NRC has been responsible for licensing radioactive materials incident to the nuclear power process since the 1950's, and licensing off-site private SNF facilities since before 1982.[229] Since then, the NRC has continued to issue licenses to the private sector, and the Fifth Circuit does not point to any change in regulatory policy that would necessitate a major questions doctrine review. Wielding the doctrine in the way *Texas v. NRC* does is an invitation for judicial activism against any policy a court disagrees with, so long as they claim to find ambiguity and meet the vague threshold of "economic and political significance" without regard to the underlying rationale of the doctrine.

VI. Conclusion

As SNF piles up within the United States, courts should not strain to find ways to worsen the current regulatory scheme, particularly through strained arguments. Although circuit courts have disagreed for nearly half a century as to how to relate SNF to the material classifications of the AEA, all had agreed that the NRC's authority extends to SNF and that the NRC can license SNF for off-site storage. Although resting on shaky foundations, these Courts were unwilling to make the national SNF problem worse, until the Fifth Circuit ruled on *Texas v. NRC*. In response to that decision, a uniform reasoning for how SNF fits into the AEA's structure is needed to solidify the authority of the NRC over SNF and overcome the Fifth Circuit's conclusion that the NRC has no authority over interim storage licensing at all.

The first step of this process is a uniform categorization of SNF as a byproduct material under the AEA. SNF fits within the plain language of the definition by being a radioactive material that is yielded in a nuclear power plant. This language becomes important due to the distinct uses authorized for each material.

228. Adler, *supra* note 221, at 60–61.
229. *See* People of State of Ill. v. Gen. Elec. Co., 683 F.2d 206 (7th Cir. 1982).

Therefore, the next step is finding the authority to issue licenses for private off-site storage facilities through 42 U.S.C. § 2111(a) for industrial use, or the catch-all provision for useful applications as they may be developed. This reading fits within both the language of the statute as well as the overall structure of the authorization statutes.

The final step is concluding, as *Bullcreek* did, that the NWPA was solely a directive to the DOE to establish supplementary programs to aid the private sector in dealing with SNF storage, while putting the onus on the federal government to create a disposal program. This conclusion also staves off the bizarre finding that the NRC's authority should be abrogated based on de facto extinct legislation that has made little progress toward realization since 1987. Further, in the absence of any repository program from Part A of the NWPA, this abrogation would reduce the federal SNF plan to on-site storage and a measly 1,900 MTU of federal storage capacity, an inadequate response to the concern.

All of this, taken together, retains the NRC's authority to license private off-site storage but does not dispel the need for a permanent solution in the future. Allowing off-site storage can extend our nuclear fleets by freeing up civilian reactors that are reaching the capacity of on-site storage, aid the decommissioning process by removing stranded SNF from retired reactors,[230] and help lower the risk of terrorist and sabotage attacks on these storage sites. While these are all benefits, they do not negate the need for a permanent solution, and soon. Allowing for off-site interim storage is both appropriate and beneficial in the short-term, however it does not represent a viable long-term solution as SNF continues to grow.

Despite the Yucca Mountain project effectively being stalled for the last decade, it has been stalled due to political fights rather than geological or logistical impossibilities. As such, it can still be salvaged given the right political environment. In February 2023, for example, bicameral state legislation was introduced for a consent-based approach to restarting the Yucca Mountain repository efforts.[231] If the Yucca Mountain project is truly doomed to fail, however, Congress must act soon. The NWPA, as it currently reads, lists Yucca Mountain as the only option for a SNF repository.[232] Before any other sites can

230. As of 2020, there were 23 nuclear waste storage facilities located at the sites of plants that are no longer operating. *See* LARSON, *supra* note 41, at 1.

231. Jessica Hill, *Nevada Reps Reintroduce Yucca Bill in Congress*, LAS VEGAS REVIEW-JOURNAL (Feb. 14, 2023), https://www.reviewjournal.com/news/politics-and-government/nevada/nevada-reps-reintroduce-yucca-bill-in-congress-2729008/ [https://perma.cc/F222-MED4].

232. 42 U.S.C. § 10172.

be considered, the NWPA needs to be amended, or a new piece of legislation needs to be written. And time is of the essence. As the first attempt at a federal disposal program shows, there is no easy solution. Any site would require long, difficult political compromises that could take decades to draw out.