

Keep Environmental Red Tape Out of Outer Space

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KEY TAKEAWAYS

The American space industry is booming, thanks to private-sector innovation spurred by the Trump Administration's focus on easing regulatory burdens.

This growth could be threatened by lengthy environmental reviews, and courts should presume that environmental protection laws do not extend to outer space.

Instead, Congress should consider requirements like liability insurance for on-orbit activities that are tailored to the unique nature of outer space.

The American space industry is booming. This explosive growth has been fueled by advances in technology and innovative thinking from the private sector,¹ spurred by the Trump Administration's focus on easing regulatory burdens.² So far, even if the Biden Administration may emphasize different priorities, it appears to be inclined to retain much of the Trump Administration's approach.³

American space dominance may not last, however, if heavy-handed regulation crushes innovation. One possible overreach comes in the form of the National Environmental Protection Act (NEPA), a decades-old statute that does not contain any geographic scope, let alone an indication that Congress intended it to apply in outer space.

A late-in-the-game challenge by a competitor to SpaceX's "Starlink" constellation of communications satellites is now before the U.S. Court of Appeals for

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the District of Columbia Circuit (D.C. Circuit).⁴ If successful, the challenge would require time-consuming and burdensome environmental analysis of satellites and other commercial spaceflight activities. This result could tie up American space innovation in thousands of pages of paperwork, millions of dollars in compliance costs, and years of litigation as China and other strategic competitors expand their space capabilities. The D.C. Circuit should take this opportunity to clarify that NEPA does not apply in outer space, thereby leaving the field open for Congress to consider requirements like liability insurance that are tailored to the unique nature of outer space.

NEPA and Outer Space

The Structure of NEPA and Categorical Exclusions. As others have explained, NEPA is a relic of the Nixon Administration that was superseded long ago by other federal and state environmental regulations.⁵ At its core, the law requires every federal agency to assess the environmental impact of “major” agency decisions and other actions with potentially “significant” effects.⁶

NEPA imposes no specific environmental standards or other substantive thresholds on the environmental effect of government action; rather, the statute requires agencies to follow certain processes before they make major decisions.⁷ Among other things, agencies must consider the environmental impact of a proposed action, whether there are any adverse environmental effects that cannot be avoided, and alternatives to the proposed action. The Council on Environmental Quality (CEQ), also established by NEPA, offers guidance to agencies, but each agency must create its own NEPA procedures and perform its own analysis.

In anticipation of nearly inevitable litigation over the sufficiency of agencies’ analysis, the NEPA process is often voluminous and time-consuming. Between 2013 and 2017, the average final environmental impact statement took 4.5 years to complete and was 669 pages long.⁸

Because environmental analysis under NEPA is laborious, the CEQ instructs agencies to identify “categories of actions that do not have a significant effect on the human environment, and therefore do not require preparation of an environmental assessment or environmental impact statement.”⁹ Agencies routinely grant a vast number of “categorical exclusions.” For example, more than 95 percent of the projects funded by the American Recovery and Reinvestment Act of 2009 received a waiver.¹⁰ If, due to “extraordinary circumstances,” an action that would normally be categorically excluded could have a significant

effect on the human environment, the agency must either prepare the required environmental analysis or “determine that there are circumstances that lessen the impacts or other conditions sufficient to avoid significant effects.”¹¹

NEPA Does Not Apply Extraterrestrially. Federal statutes like NEPA generally apply only within the jurisdiction of the United States.¹² The Supreme Court of the United States has adopted a two-step framework to analyze whether a statute applies extraterritorially, first looking for an affirmative indication of the statute’s geographic scope. As Justice Antonin Scalia wrote in 2010, “[w]hen a statute gives no clear indication of an extraterritorial application, it has none.”¹³

If a statute is not extraterritorial, courts will consider whether the particular case involves a domestic application of the statute: “If the conduct relevant to the statute’s focus occurred in the United States, then the case involves a permissible domestic application even if other conduct occurred abroad.”¹⁴ The presumption against extraterritoriality applies even when conduct occurs in areas that are outside of the control of any sovereign state, like the high seas,¹⁵ and “regardless of whether there is a risk of a conflict between the American statute and a foreign law.”¹⁶

The presumption against extraterritoriality should carry special weight when considering whether a statute applies to outer space. Like the high seas, outer space is an area outside of the control of any sovereign state. By treaty, the United States has taken responsibility for the activities of its nationals in outer space,¹⁷ and Congress has developed specific statutes to regulate government and private activity in outer space. As a result, as with the high seas,¹⁸ when it desires to do so, Congress has expressly extended statutes to apply in outer space. For example, federal jurisdiction extends to tort claims resulting from licensed space launch and reentry activities,¹⁹ and federal criminal law applies within the special maritime and territorial jurisdiction of the United States, which expressly includes spacecraft while they are in flight.²⁰

The plain language of NEPA gives no indication that the statute applies extraterritorially, let alone extraterrestrially. Although some courts have applied NEPA outside of the United States,²¹ in a 2020 update to the statute’s implementing regulations, the CEQ stated that the statute does not apply to “[e]xtraterritorial activities or decisions, which means agency activities or decisions with effects located entirely outside of the jurisdiction of the United States.”²² Although the Biden Administration has publicly announced that it will reconsider the 2020 update to NEPA’s implementing regulations, the regulations remain in force.²³

Even if NEPA were to apply extraterritorially, that would not be enough to extend the statute to outer space. The text of NEPA is replete with earth-bound language.

- At various points, the statute refers to the “*worldwide... character of environmental problems*,”²⁴ implicitly excluding environmental problems that are outside of the Earth.
- NEPA also discusses the importance of efforts that “will prevent or eliminate damage to the environment *and biosphere*,”²⁵ again implying that problems beyond Earth are also beyond the reach of the statute.
- As part of the congressional debate on the conference report of the bill that became NEPA, the legislation’s principal sponsors spoke of the need “to preserve and enhance our *air, aquatic, and terrestrial environments*.”²⁶
- They further explained that the act would protect against “actions which do irreparable damage to the *air, land and water* which support life on earth.”²⁷ They did not discuss outer space—an area outside of the air, aquatic, or terrestrial environments.

The second step of extraterritoriality analysis—whether conduct relevant to the focus of the statute occurred in the United States²⁸—also does not suggest that NEPA should be applied to agency actions that affect outer space. NEPA’s concern is whether an agency action will have a significant environmental impact, making the location where that impact would occur—in this case, outer space—the area of relevant conduct.²⁹ Without any relevant conduct inside of the United States, NEPA would not extend into outer space.

Executive Order 12114, President Jimmy Carter’s 1979 directive on the environmental effects abroad of agency action, did not change the scope of NEPA. It directed federal agencies to take environmental impact into account when considering major federal actions that significantly affect “the global commons outside of the jurisdiction of any nation” such as “the oceans or Antarctica.”³⁰ The CEQ recently clarified that Executive Order 12214, as a presidential policy directive, “does not extend the reach of NEPA and CEQ is free to align NEPA with the presumption against extraterritoriality.”³¹ Moreover, an executive order by President Donald Trump made clear that even though outer space is outside of U.S. territorial jurisdiction,

“the United States does not view it as a global commons,”³² thereby placing it outside the scope of Executive Order 12114.

Agency Practice When Considering Environmental Effects of Spaceflight. Agency practice confirms that NEPA does not apply to actions that affect outer space. The statute was debated in 1969, the year of the Apollo 11 and 12 lunar landings, but there is no evidence that the National Aeronautics and Space Administration (NASA) carried out NEPA reviews before subsequent Apollo missions planted American flags and left behind the lower half of their lunar modules on the moon.³³ To the contrary:

- Under its current NEPA regulations, which were updated most recently in 2012, NASA prepares environmental analysis for spacecraft development and spaceflight projects and programs, but that analysis focuses on the effects of spaceflight on Earth’s environment. The regulations do not expressly require any analysis with respect to the effects of NASA missions on the environment of outer space.³⁴ For instance, the regulations specifically require NASA to prepare NEPA analysis when a spaceflight project or program plans to return extraterrestrial samples to Earth from asteroids, comets, or other planets.³⁵ There is no requirement for NASA to prepare NEPA analysis when extraterrestrial samples are obtained and analyzed in outer space without a plan to return them to Earth.
- NASA’s 2011 Environmental Assessment for launches of routine payloads focuses on launch and construction activities at sites within the United States. The assessment briefly considers the effect of orbital debris, but not debris in outer space.³⁶ Rather, NASA takes the view that “[o]rbital debris becomes a NEPA issue when either existing debris or a spacecraft reenters the atmosphere.”³⁷ Similarly:
- NASA’s 2014 Final Environmental Impact Statement for the Mars 2020 Mission—a mission that involved landing a plutonium-powered rover on the surface of Mars—describes the affected environment of the mission as the “regional area surrounding Cape Canaveral Air Force Station (CCAFS) and the Kennedy Space Center, Florida,” and, in accordance with Executive Order 12114 rather than NEPA, “the global environment.”³⁸ The description of the affected environment for the Mars mission makes no mention of Mars or outer space between the Earth and Mars.

Similarly, the Federal Aviation Administration (FAA), which regulates space launches and reentries, does not expressly require analysis of the effects on the environment of outer space as part of its licensing process.³⁹ The FAA's analysis considers a variety of possible environmental consequences, including the effect of launches and reentries on air quality, light and noise pollution, and the creation of hazardous materials, focusing on the effects at launch and reentry sites inside the United States.⁴⁰ Like NASA, the FAA, in accordance with Executive Order 12114, considers whether certain aspects of launches would have a significant environmental impact outside of the United States.⁴¹ That analysis is not based on the requirements of NEPA and does not appear to consider environmental effects that may occur in outer space.

Finally, the Federal Communications Commission (FCC), which regulates satellite communications, for decades has applied a categorical exclusion under NEPA to its review of satellite license applications.⁴² Outside of NEPA, the FCC has established a regulatory regime to mitigate the effects of orbital debris from satellites, including the risk of orbital debris reentering the atmosphere.⁴³ Separately, NASA maintains and periodically updates guidelines to mitigate orbital debris from U.S. government space programs.⁴⁴

ViaSat's Attempt to Weaponize NEPA Against SpaceX

The applicability of NEPA in outer space ceased to be an academic question in December 2020 when ViaSat, a satellite communications company, filed a petition to challenge the Federal Communications Commission's approval of the SpaceX Starlink satellite constellation on the grounds that the FCC had failed to analyze the environmental effects of Starlink.⁴⁵

Starlink is a planned constellation of more than 4,400 small satellites in low-Earth orbit that will provide low-latency, high-speed broadband Internet service to remote locations on Earth, including many locations where high-speed Internet is not practical using terrestrial services.⁴⁶ SpaceX is one of several companies that seek to build satellite constellations over the next several years to provide high-speed Internet from outer space: OneWeb plans to launch nearly 650 satellites, and Amazon's Project Kuiper hopes to launch more than 3,000 satellites.⁴⁷ ViaSat already provides satellite Internet service, although at significantly lower speeds than SpaceX's Starlink service.⁴⁸

In 2018, the FCC approved SpaceX's application to launch and operate the Starlink constellation, and between April 2019 and April 2021, the FCC

considered three modifications to its approval to allow SpaceX to lower the altitude of the Starlink satellites and reconfigure their orbits.⁴⁹ These modifications would improve the coverage and broadband latency of the Starlink constellation.⁵⁰

Sparked by a student note in a specialized law journal,⁵¹ ViaSat filed a petition with the FCC in December 2020, relying on a quirk in the commission's rules that allows any interested person to challenge whether a categorically excluded action would have a significant environmental impact.⁵² ViaSat's petition, which came nearly six months after the company had initially challenged SpaceX's modifications on other, non-environmental grounds, argued that the commission should have required an environmental impact statement under NEPA before approving Starlink.⁵³

Among other things, ViaSat and a group of environmentalists claimed that the launch and reentry of Starlink satellites could damage the environment, that the Starlink constellation would harm astronomy by creating "light pollution," and that the sheer quantity of Starlink satellites would lead to collisions in space, creating additional orbital debris.⁵⁴ Some of these concerns, including the emissions created by Starlink launches and reentries, had already been considered through the FAA's environmental review; others, like the risk of collision and reentry damage from Starlink satellites, fall squarely within the FCC's categorical exclusion either because they present little potential for environmental harm or because the risk of harm has been mitigated.

ViaSat's novel claim that Starlink would create "light pollution" encounters a similar difficulty: Unlike satellites farther from the Earth, Starlink's low-Earth orbit satellites present less concern because they are in Earth's shadow and invisible for many hours each night around local solar midnight.⁵⁵ Ironically, ViaSat did not perform an environmental assessment under NEPA for its own satellite constellation.

Although there was no need for the FCC to carry out an environmental assessment of ViaSat's constellation, the selective use of NEPA challenges shows how broadly worded statutes and regulations are susceptible to weaponization by private actors whose concerns may be driven more by commercial competition than by environmental protection.⁵⁶

In April 2021, the FCC reviewed SpaceX's most recent modification request and ViaSat's NEPA challenge. Guarding against future litigation risk, the FCC assumed "out of an abundance of caution" that NEPA might apply in outer space and considered the environmental concerns raised by ViaSat.⁵⁷ The commission analyzed each of ViaSat's arguments and determined that because Starlink would not have a significant environmental impact, there

was no need for additional environmental review under NEPA.⁵⁸ Accordingly, the FCC approved SpaceX's modifications.

In early June 2021, ViaSat appealed the FCC's ruling to the D.C. Circuit and asked that court to stay the FCC's decision and stop any further SpaceX launches.⁵⁹ In a brief order, the D.C. Circuit held that ViaSat "has not satisfied the stringent requirements for a stay pending court review" and set an expedited briefing schedule for the case.⁶⁰

Any Environmental Regulation Should Be Tailored to the Unique Nature of Outer Space

The D.C. Circuit should reject ViaSat's appeal and clarify that NEPA does not apply to outer space. To do so, the D.C. Circuit need not resolve the broader question of whether NEPA has any extraterritorial application; it could simply hold that in accordance with the text of the statute and long-standing practice, NEPA does not require analysis of whether agency action will have a significant effect outside of Earth's environment. Moreover, to the extent that Starlink or any other satellite constellation affects the environment of the Earth, those effects are already considered in the environmental review that is a part of the FAA's launch and reentry licensing process.

Future private-sector innovation will likely include planned launches into outer space and reentries into the Earth's atmosphere on a regular basis.⁶¹ Under the FCC's regulations, once the FAA has completed its review of the environmental effects of a launch and reentry, it is not necessary for the FCC to take a second bite at the environmental analysis apple to consider the same environmental effects.⁶² Moreover, in addition to NEPA's procedural standard, substantive environmental rules stemming from numerous other federal statutes will continue to regulate the effects of spaceflight on air pollution, water quality, and the disposal of hazardous materials within the United States.

Even without NEPA, there is still a place for environmental protection in outer space as the U.S. space industry continues to grow. Numerous international agreements, including the 1967 Outer Space Treaty, recognize that space is a legally and physically unique domain of human activity. Rather than attempt to apply NEPA's outdated procedural standard, any environmental regulation should ensure the safe use of outer space while not impeding the innovation that has been a recent hallmark of the U.S. commercial space industry.

A workable liability regime is one possible way to protect the environment of outer space. A small number of international agreements already

deal with liability in outer space, starting with the provision of the 1967 Outer Space Treaty that obligates states to give “due regard to the corresponding interests of all other States Parties to the Treaty.”⁶³ Elaborating on this requirement, the 1972 Liability Convention provides rules for determining liability for damages caused by space objects,⁶⁴ and the 1976 Registration Convention requires spacefaring states to maintain a registry of space objects.⁶⁵ In particular, the Liability Convention makes clear that states are responsible for damage to third parties from their space activities, including the space activities of their nationals.⁶⁶

These international agreements create a small yet workable set of basic principles that Congress and the FCC have already started to incorporate into U.S. statutes and regulations. By statute, commercial launch operators must obtain liability insurance for up to \$500 million in harm to third parties that results from activities under a launch or reentry license.⁶⁷ The same statutory scheme also requires the U.S. government to indemnify launch operators for up to \$3 billion in claims in excess of the launch operator’s insurance.⁶⁸ And in its recent orbital debris regulation, the FCC required satellite owners to indemnify the United States for any claims brought against the United States under international outer space treaties.⁶⁹

Congress could build on those principles by requiring spacecraft operators to carry liability insurance for on-orbit activities. Currently, only a handful of satellite operators are insured against harms caused to third parties by their satellites, such as collisions or environmental damage.⁷⁰ Building on the existing insurance requirement for launch and reentry operators and the FCC’s indemnification requirement, a requirement for liability insurance for on-orbit activities would ensure that operators take reasonable steps to prevent environmental harm in outer space without imposing NEPA’s time-consuming and litigation-prone process. The FCC has already begun to assemble the data necessary to improve the market for insurance against on-orbit harms by requiring satellite operators to quantify the risk of collisions, the probability of disposing of spacecraft, and the casualty risk of spacecraft upon reentry.⁷¹

The FCC could take another step in the right direction by requiring, as a condition of obtaining access to the U.S. market, that companies purchase liability insurance if they obtain launch licenses from states that have not acceded to the three basic international agreements governing liability in outer space. One such application from a company licensed by Papua New Guinea—a state that is a party to neither the Liability Convention nor the Registration Convention—to create a constellation of nearly 250 large satellites is now before the commission.⁷²

Conclusion

The D.C. Circuit should reject ViaSat's attempt to weaponize NEPA against SpaceX and clarify that the statute does not apply in outer space. Absent a clear indication, statutes are presumed not to apply outside of the jurisdiction of the United States. The D.C. Circuit need not settle the broader question of whether NEPA has any extraterritorial application because neither the text of NEPA nor agency practice over the past 50 years suggests that the statute applies extraterrestrially. Moreover, the effects of space launches and reentries on Earth's environment are already accounted for in the NEPA process that is part of the FAA's licensing process.

Rather than adding a second round of cumbersome and litigation-prone environmental review for on-orbit activities, Congress should continue to incorporate the liability principles of existing international agreements into U.S. law. Building on the existing statutory requirement for launch and reentry operators to carry liability insurance and the FCC's indemnification requirement, Congress could consider requiring commercial spacecraft operators to carry insurance against harms caused to third parties by on-orbit activities. Such an approach would protect the outer space environment while preserving America's competitiveness in space.

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Endnotes

1. See, e.g., John Venable, *America's Trifecta in Space: Odds Are We've Regained Dominance in This Domain, But Can We Keep It?*, REAL CLEAR DEFENSE (Nov. 7, 2020), https://www.realcleardefense.com/articles/2020/11/07/americas_trifecta_in_space_odds_are_weve_regained_dominance_in_this_domain_but_can_we_keep_it_583298.html?utm_source=dlvr.it&utm_medium=twitter (last visited Aug. 2, 2021).
2. See, e.g., Space Policy Directive-2, Streamlining Regulations on Commercial Use of Space, 83 Fed. Reg. 24901 (May 24, 2018), <https://www.govinfo.gov/content/pkg/FR-2018-05-30/pdf/2018-11769.pdf> (last visited Aug. 3, 2021).
3. See, e.g., Sandra Erwin, *Biden Administration to Continue the National Space Council*, SPACE NEWS (Mar. 29, 2021), <https://spacenews.com/biden-administration-to-continue-the-national-space-council/> (last visited Aug. 2, 2021).
4. See Motion to Stay Pending Judicial Review, *ViaSat, Inc. v. FCC*, No. 21-1123 (D.C. Cir., June 2, 2021).
5. For background on NEPA and arguments for its repeal, see Diane Katz, *Curbing Abuses of a Politicized NEPA*, HERITAGE FOUND. BACKGROUNDER No. 3524 (Aug. 25, 2020), <https://www.heritage.org/sites/default/files/2020-08/BG3524.pdf>; Diane Katz, *Time to Repeal Obsolete National Environmental Policy Act (NEPA)*, HERITAGE FOUND. BACKGROUNDER No. 3293 (Mar. 14, 2018), https://www.heritage.org/sites/default/files/2018-03/BG3293_0.pdf.
6. 42 U.S.C. § 4332(C).
7. Katz, *Curbing Abuses of a Politicized NEPA*, *supra* note 6.
8. See COUNCIL ON ENVTL. QUALITY, LENGTH OF ENVIRONMENTAL IMPACT STATEMENTS (2013–2017) (July 22, 2019), https://ceq.doe.gov/docs/nepa-practice/CEQ_EIS_Length_Report_2019-7-22.pdf; COUNCIL ON ENVTL. QUALITY, ENVIRONMENTAL IMPACT STATEMENT TIMELINES (2010–2017) (Dec. 14, 2018), https://ceq.doe.gov/docs/nepa-practice/CEQ_EIS_Timelines_Report_2018-12-14.pdf.
9. 40 C.F.R. § 1501.4(a).
10. Katz, *Time to Repeal Obsolete National Environmental Policy Act (NEPA)*, *supra* note 6, at 2.
11. 40 C.F.R. § 1501.4(b).
12. See *Nestle USA, Inc. v. Doe et al.*, No. 19-416, slip op. at 3 (June 17, 2021) (“[W]e presume that a statute applies only domestically, and we ask whether the statute gives a clear, affirmative indication that rebuts this presumption.” (internal quotation omitted)), https://www.supremecourt.gov/opinions/20pdf/19-416_i4dj.pdf. For purposes of the presumption against extraterritoriality, the territorial jurisdiction of the United States consists of “its land, internal waters, territorial sea, the adjacent airspace, and other places over which the United States has sovereignty or some measure of legislative control.” AM. LAW INST., RESTATEMENT (FOURTH) OF FOREIGN RELATIONS LAW § 404, cmt. (d) (2018).
13. *Morrison v. National Australia Bank Ltd.*, 561 U.S. 247, 255 (2010).
14. *RJR Nabisco, Inc. v. European Community*, 136 S. Ct. 2090, 2101 (2016).
15. See *Smith v. United States*, 507 U.S. 197 (1993) (the presumption against extraterritoriality applies in “sovereignless” areas); *Basel Action Network v. Maritime Admin.*, 370 F. Supp. 2d 57 (D.D.C. 2005) (NEPA does not apply on the high seas). Some commentators have argued that *Environmental Defense Fund v. Massey*, 986 F.2d 528 (D.C. Cir. 1993), should be extended to apply NEPA in outer space. See, e.g., Thomas J. Herron, *Deep Space Thinking: What Elon Musk's Idea to Nuke Mars Teaches Us About Regulating the “Visionaries and Daredevils” of Outer Space*, 41 COLUM. J. ENVTL. L. 553, 603 (2016). *Massey*, however, dealt with a federally sponsored food incineration project in Antarctica where, unlike outer space, the United States has a degree of legislative control. Moreover, *Smith*, which was decided three months after *Massey*, rejected the *Massey* court’s assumption that the presumption against extraterritoriality does not apply in “sovereignless” areas.
16. 561 U.S. 247, at 255.
17. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, arts. VII and VIII, Jan. 27, 1967, 610 U.N.T.S. 205 [hereinafter *Outer Space Treaty*].
18. See *Argentine Republic v. Amerasia Shipping Corp.*, 488 U.S. 428, 440 (1989) (“When it desires to do so, Congress knows how to place the high seas within the jurisdictional reach of a statute.”).
19. 51 U.S.C. § 50914(g).
20. 18 U.S.C. § 7(6).
21. See Maura M. Kelly, *Environmental Responsibilities Overseas: The National Environmental Policy Act and the Export–Import Bank*, 34 B.C. ENVTL. AFF. L. REV. 335, 341–48 (2007) (reviewing cases).
22. 40 CFR § 1508.1(q)(1)(i).
23. See COUNCIL ON ENVTL. QUALITY, DEADLINE FOR AGENCIES TO PROPOSE UPDATES TO NATIONAL ENVIRONMENTAL POLICY ACT PROCEDURES, 86 Fed. Reg. 34154 (June 29, 2021), <https://www.govinfo.gov/content/pkg/FR-2021-06-29/pdf/2021-13770.pdf> (last visited Aug. 3, 2021); Ellen Gilmer, *Biden Works to Preserve Trump Environmental Rule amid Review*, BLOOMBERG LAW (Apr. 21, 2021), <https://news.bloomberglaw.com/environment-and-energy/biden-pushes-to-preserve-trump-environmental-rule-amid-review> (last visited July 29, 2021).
24. 42 U.S.C. § 4332(F). Emphasis added.

25. 42 U.S.C. § 4321. Emphasis added.
26. 115 CONG. REC. 40924 (Dec. 22, 1969) (remarks of Rep. Dingell). Emphasis added.
27. 115 CONG. REC. 40416 (Dec. 20, 1969) (remarks of Sen. Jackson). Emphasis added.
28. *Nestle*, slip op. at 3–4.
29. See *id.*, at 4–5 (allegations of operational decision-making inside the United States do not suffice to establish a domestic application of a statute).
30. Exec. Order No. 12114, § 2-3(a), 44 Fed. Reg. 1957 (Jan. 4, 1979), https://archives.federalregister.gov/issue_slice/1979/1/9/1955-1960.pdf#page=3 1955-1960.pdf (last visited Aug. 3, 2021).
31. COUNCIL ON ENVTL. QUALITY, UPDATE TO THE REGULATIONS IMPLEMENTING THE PROCEDURAL PROVISIONS OF THE NATIONAL ENVIRONMENTAL POLICY ACT, FINAL RULE RESPONSE TO COMMENTS, at 551 (June 30, 2020), <https://ceq.doe.gov/docs/laws-regulations/ceq-final-rule-response-to-comments-2020-06-30.pdf> (last visited Aug. 2, 2021).
32. Exec. Order No. 13914, § 1, 85 Fed. Reg. 20381 (Apr. 6, 2020), <https://www.govinfo.gov/content/pkg/FR-2020-04-10/pdf/2020-07800.pdf> (last visited Aug. 3, 2021). Cf. John Goehring, *Why Isn't Space a Global Commons?*, 11 J. NAT'L SECURITY L. & POL'Y ____, at 15 (forthcoming 2021) (arguing that outer space "is a global commons in the sense of being a domain beyond national jurisdiction and with free and open access, but it is not a global commons in the sense of being commonly owned such that nations cannot assert private property interests in space resources.").
33. Anna Heiney, *Apollo's Lunar Leftovers*, NASA (June 28, 2004), https://www.nasa.gov/missions/solarsystem/f_leftovers.html (last visited Aug. 2, 2021).
34. See Herron, *supra* note 16, at 603 n. 332 ("[T]he NASA EIS procedures focus on Earth-based effects and do not explicitly require assessment of the outer space environment.").
35. 14 CFR §§ 1216.305–306.
36. NASA, ENVIRONMENTAL ASSESSMENT FOR LAUNCH OF NASA ROUTINE PAYLOADS (Nov. 2011), https://www.nasa.gov/pdf/603832main_FINAL%20NASA%20Routine%20Payload%20EA%20Resized.pdf (last visited Aug. 3, 2021).
37. *Id.* at 3-14.
38. NASA, FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE MARS 2020 MISSION (Nov. 2014), at 3-1, https://mars.nasa.gov/mars2020/files/mep/Mars2020_Final_EIS.pdf (last visited Aug. 2, 2021).
39. See FAA Order No. 1050.1F, Environmental Impacts: Policies and Procedures (July 16, 2015), https://www.faa.gov/documentLibrary/media/Order/FAA_Order_1050_1F.pdf (last visited Aug. 2, 2021).
40. See, e.g., FAA, FINAL ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT FOR SPACE X FALCON LAUNCHES AT KENNEDY SPACE CENTER AND CAPE CANAVERAL AIR FORCE STATION (July 2020), https://www.faa.gov/space/environmental/nepa_docs/media/SpaceX_Falcon_Program_Final_EA_and_FONSI.pdf (last visited Aug. 2, 2021).
41. *Id.* at 64–65 (noting that the FAA evaluated the effects of air pollutants emitted over the Atlantic Ocean outside of U.S. territorial waters).
42. See 47 CFR §§ 1.1306 and 1.1307 (identifying specific categories of FCC actions that require more detailed NEPA review and categorically exclude all other FCC actions).
43. FCC, Mitigation of Orbital Debris in the New Space Age, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd 4156 (2020) [hereinafter FCC Orbital Debris Rule].
44. NASA, U.S. GOVERNMENT ORBITAL DEBRIS MITIGATION STANDARD PRACTICES, NOVEMBER 2019 UPDATE, https://orbitaldebris.jsc.nasa.gov/library/usg_orbital_debris_mitigation_standard_practices_november_2019.pdf (last visited Aug. 2, 2021).
45. ViaSat, Inc., Petition Pursuant to Section 1.1307(c), FCC File No. SAT-MOD-20200417-00037 (Dec. 22, 2020) [hereinafter ViaSat Petition].
46. In re Space Exploration Holdings, LLC Request for Modification of the Authorization for the SpaceX NGSO Satellite System, Order and Authorization and Order on Reconsideration, at 10, FCC File No. SAT-MOD-20200417-00037 (Apr. 27, 2021) [hereinafter April 2021 FCC Order].
47. Alan Weissberger, *Revitalized OneWeb Challenges SpaceX/Starlink & Amazon/Kuiper for Broadband Satellite Service*, IEEE COMSOC TECH. BLOG (Dec. 10, 2020), <https://techblog.comsoc.org/2020/12/10/revitalized-oneweb-challenges-spacex-starlink-amazon-kuiper-for-broadband-satellite-service/> (last visited Aug. 2, 2021).
48. Alan Weissberger, *PCMag Study: Starlink Speed and Latency Top Satellite Internet from Hughes and ViaSat's Exede*, IEEE COMSOC TECH. BLOG (Nov. 4, 2020), <https://techblog.comsoc.org/2020/11/04/pcmag-study-starlink-speed-and-latency-top-satellite-internet-from-hughes-and-viasats-exede/> (last visited Aug. 2, 2021).
49. Opposition to Motion for Stay Pending Judicial Review, *ViaSat, Inc. v. FCC*, No. 21-1123 (D.C. Cir., June 14, 2021).
50. *Id.*
51. Ramon J. Ryan, *The Fault in Our Stars: Challenging the FCC's Treatment of Commercial Satellites as Categorically Excluded from Review Under the National Environmental Policy Act*, 22 VAND. J. ENT. & TECH. L. 923 (2020).
52. 47 C.F.R. § 1.1307(c).

53. See ViaSat Petition, *supra* note 46.
54. *Id.* at 8–9.
55. See Opposition of Space Exploration Holdings, LLC to Petition Pursuant to Section 1.1307(c) of ViaSat, Inc., at iii, FCC File No. SAT-MOD-20200417-00037 (Jan. 6, 2021).
56. See *id.* at ii. Adding to the irony, ViaSat, which previously had relied on SpaceX’s Falcon rockets to place its satellites in orbit, recently selected the United Launch Alliance’s Atlas V rocket for its future launches. The Atlas V rocket uses solid fuel in its auxiliary engines, which, unlike the liquid fuel used by SpaceX’s rockets, produces significant inorganic chlorine and alumina emissions. See *How Much Do Rockets Pollute?*, EVERYDAY ASTRONAUT (Mar. 20, 2020), <https://everydayastronaut.com/rocket-pollution/> (last visited Aug. 2, 2021).
57. April 2021 FCC Order, *supra* note 47, at ¶ 77.
58. *Id.*
59. Motion to Stay Pending Judicial Review, *supra* note 5.
60. Order, ViaSat, Inc. v. FCC, No. 21-1123 (D.C. Cir., July 20, 2021).
61. See, e.g., Kia Kokalitcheva, *Varda Space Raises \$9 Million for Manufacturing in Space*, AXIOS (Dec. 8, 2020), <https://www.axios.com/var-da-space-9-million-manufacturing-space-0b9970c4-4394-4e61-a0a1-c4980e12acf9.html> (last visited Aug. 2, 2021).
62. See 47 CFR § 1.1311(e) (FCC regulation stating that environmental analysis under NEPA is not necessary “if another agency of the Federal Government has assumed responsibility for determining whether of the facilities in question [*sic*] will have a significant effect on the quality of the human environment and, if it will, for invoking the environmental impact statement process.”).
63. Outer Space Treaty, *supra* note 18, at art. IX.
64. Convention on the International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 961 U.N.T.S. 187 [hereinafter Liability Convention].
65. Convention on the Registration of Objects Launched into Outer Space, Sept. 15, 1976, 1023 U.N.T.S. 15.
66. See Liability Convention, *supra* note 65.
67. 51 U.S.C. § 50914.
68. 51 U.S.C. § 50915.
69. FCC Orbital Debris Rule, *supra* note 44, ¶¶ 146–165.
70. See Victoria A. Samson, Joshua D. Wolny, and Ian Christensen, *Can the Space Insurance Industry Help Incentivize the Responsible Use of Space?*, INT’L ASTRONAUTICAL FED’N, at 3, https://swfound.org/media/206275/iac-2018_manuscript_e342.pdf (last visited Aug. 2, 2021) (“[O]nly a handful of satellites carry liability insurance”); *2019 Space Insurance Update*, AXA/XL GROUP, https://iuai.org/IUAI/Study_Groups/Space_Risks/Public/Study_Groups/Space_Risk.aspx (last visited Aug. 2, 2021) (finding that only 6 percent of satellites in low-Earth orbit are insured on-orbit).
71. FCC Orbital Debris Rule, *supra* note 44.
72. See James E. Dunstan, *Who Wants to Step Up to a \$10 Billion Risk?*, SPACENEWS (June 25, 2021), <https://spacenews.com/op-ed-who-wants-to-step-up-to-a-10-billion-risk/> (last visited Aug. 2, 2021).