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A Blast from the Past: Seismic Airgun Policy and the Need for Reform

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A BLAST FROM THE PAST: SEISMIC AIRGUN POLICY AND THE NEED FOR REFORM

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I. INTRODUCTION

This Note explores the long-term harms of seismic airgun blasting on marine mammals and the legal remedies, beyond a temporary restraining order (TRO), available to prevent further takes of marine mammals due to the harmful activity. It also examines what legal remedies are available to certain species under the Marine Mammal Protection Act (MMPA). This Note also explores other cases that have dealt with similar issues, counter arguments, and forthcoming technologies that will allow companies to find oil with less harm to the environment.

Seismic airgun blasting is the act of using an airgun to find oil and gas trapped under the ocean floor.¹ The airgun blasts are repeated every ten seconds for days, or more, at a time.² These blasts cause irreparable harm to the marine mammals they reach.³ Various reports show that animals in the affected blasting area can suffer from

* J.D. Candidate, 2018, Florida State University College of Law. I would like to thank Professor Erin Ryan for her guidance throughout the writing process; my mother, Leslie, for her unwavering love and support; my dear friend and colleague, Jessica Farrell, for being a consistent listening ear and attentive editor; and the *Florida State University Law Review* for an enjoyable publishing process.

1. *Seismic Airgun Blasting: Overview*, OCEANA, <http://oceana.org/our-work/climate-energy/seismic-airgun-blasting/overview> [<https://perma.cc/VE2A-45AK>].

2. *Id.*

3. *Id.*

hearing loss, mating and feeding disruption, abandonment of habitat, and even death.⁴ In some cases, as the mammals attempt to escape the area of the blasts, their migration patterns are disrupted.⁵ Some whales may attempt to go closer to the vessels out of curiosity, causing them even more harm.⁶

The harm caused by the airguns can constitute a prohibited “take” under both the Endangered Species Act (ESA) and the MMPA. In both the ESA and the MMPA, “take” means to “harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal.”⁷ Hearing loss, interference with migration and breeding, and habitat abandonment have all satisfied previous definitions of “harassment” in accordance with the ESA.⁸ Considering the similar language of both statutes, the marine mammals on the east coast of the United States should have the same protections under the MMPA as other animals do under the ESA.

As this issue has only recently resurfaced due to the increased activity of airgun blasting off the east coast of the United States, there is not yet much current commentary in the legal community on this topic specifically. However, *Winter v. Natural Resources Defense Council*, addressing the U.S. Navy’s use of sonar in southern California waters, may give guidance on how to regulate airgun blasting because of the similarities and differences of the two situations.⁹ In *Winter*, the importance of national security was the deciding factor for allowing sonar trainings to continue, while the present situation is about using seismic airguns to map areas of the ocean that will not be drilled for at least another five years.¹⁰

There are, of course, many proponents of seismic airgun blasting. Actors in favor of the blasts argue that there is a need for the data, because the data they currently have is decades old.¹¹ They also argue that it is cost-effective for the government, because the companies foot the bill.¹² Proponents add that the eventual drilling that re-

4. *Id.*

5. *Id.*

6. *Id.*

7. 16 U.S.C. § 1362(13) (2012); 16 U.S.C. § 1532(19) (2012). The definition of “take” in the ESA is similar, but not identical, to the definition in the MMPA. In the ESA, “‘take’ means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” § 1532(19).

8. *See infra* Section II.B.

9. *Winter v. Nat. Res. Def. Council, Inc.*, 555 U.S. 7, 7 (2008).

10. *Id.*; *see infra* note 185.

11. Vera Bergengruen, *No Atlantic Drilling for Now, but Seismic Airgun Blasts Might Go On*, McCLATCHY DC BUREAU (Apr. 5, 2016, 4:12 PM), <http://www.mcclatchydc.com/news/nation-world/national/article70080232.html> [<https://perma.cc/AR9B-92P8>].

12. *Id.*

sults from these tests will create jobs and revenue.¹³ However, there are other alternatives to the blasts. There are other technologies being developed, such as ambient seismic field noise-correlation tomography (ASNT), that use sensors on the sea floor instead of explosions.¹⁴

Many things can be done until new technologies become realistic best practices. The U.S. Bureau of Ocean Energy Management (BOEM) has developed a comprehensive permitting process.¹⁵ This change came from an agreement between the U.S. Department of the Interior and other environmental groups.¹⁶ In partnership with the National Oceanic and Atmospheric Administration (NOAA), BOEM either approves, rejects, or gives guidance to companies that want to conduct seismic testing.¹⁷ In addition to the permit, companies looking to conduct surveys also need Incidental Harassment Authorizations (IHAs), which allow small takes of marine mammals, so long as it will not have a big effect on the population.¹⁸ IHAs are only issued in situations in which the activity has “no potential for serious injury or mortality” of the animals effected.¹⁹ However, smaller studies appear to show that permanent injuries, and even death, are a likely result of the use of seismic sources.²⁰

Part II of this Note reviews the history of seismic airgun blasting, and other seismic sources. Part II will also examine the significant harms caused to animals by airgun blasts. Part III will discuss the relevant legislative history regarding marine mammals and the current legal discussion surrounding the issue. Next, Part IV will dive into *Winter v. Natural Resources Defense Council* and possible guidance that can be extracted from the Supreme Court’s decision. Part V considers counterarguments and why testing in some fashion is actually necessary for the United States’ future in energy. Part VI will

13. *Id.*

14. Ker Than, *Stanford Scientists Use Ocean Waves to Monitor Offshore Oil and Gas Fields*, STAN. NEWS (Jan. 27, 2015), <http://news.stanford.edu/2015/01/27/oceans-seismic-monitor-012715/> [<https://perma.cc/P8UA-W8TV>].

15. U.S. BUREAU OF OCEAN ENERGY MGMT., ATLANTIC G&G PERMITTING PROCESS, <http://www.boem.gov/Atlantic-Permitting-Process/> [<https://perma.cc/9NGQ-8D4Y>].

16. *See* Settlement Agreement, Nat. Res. Def. Council, Inc. v. Jewell, No. 2:10-cv-01882 (E.D. La. June 18, 2013), <http://www.boem.gov/BOEM-Lawsuit-Settlement-Agreement/> [<https://perma.cc/6MGB-TBRH>].

17. *Partnering with the National Oceanic and Atmospheric Administration*, BUREAU OCEAN ENERGY MGMT., <http://www.boem.gov/Environmental-Stewardship/Environmental-Studies/Partnerships/Partner-NOAA.aspx> [<https://perma.cc/8XRR-G54G>].

18. *Marine Mammal Protection Act (MMPA)*, BUREAU OCEAN ENERGY MGMT., <https://www.boem.gov/Environmental-Stewardship/Environmental-Assessment/MMPA/index.aspx> [<https://perma.cc/K3VV-7M9B>].

19. *Id.*

20. Candace Calloway Whiting, *Panicked Whales Are Stranding in Area of Seismic Exploration*, HUFFINGTON POST (Sept. 13, 2013, 4:30 PM), http://www.huffingtonpost.com/candace-calloway-whiting/whales-in-trouble_b_3901423.html [<https://perma.cc/TL45-T77Z>].

briefly discuss alternative surveying methods and a potential way to monitor blasts and the harm caused by them.

On December 20, 2016, President Barak Obama announced bans of offshore drilling in parts of the Atlantic and Arctic Oceans.²¹ In this exercise of executive authority, the Obama Administration has potentially saved countless marine mammals, and the ecosystem in which they live, from the negative effects of seismic surveys and drilling. Although there is some overlap between the area researched for this Note and the area covered by the prohibition, the protected waters do not extend as far south along the eastern Atlantic Coast as the seismic survey permits (recently granted by BOEM) reach.²² The sweeping, yet nonexpansive, order does not affect the necessary analysis of the harms caused by seismic airgun blasting and potential solutions to the perceived problem.

As the seismic surveying process currently stands, a TRO is needed under the MMPA to prevent any future takes of marine mammals. Until less harmful technologies are fully operational, more studies need to be done to determine how seismic airgun blasting truly affects marine mammals. Based on the limited information available, there appears to be a lasting physical effect on the mammals, which IHAs do not cover.²³ Therefore, if future studies show even a chance of the seismic sources causing physical harms, IHAs should not be granted, and a permanent injunction against all seismic sources will be necessary.

II. THE BLASTING PROCESS

Seismic sources have been used to conduct geophysical surveys for many decades.²⁴ Geophysical surveys use various forms of energy sources to map the physical characteristics of rock formations below the surface of the earth.²⁵ There are various types of geophysical survey methods, but testing using seismic sources is the most common.²⁶

21. William Yardley & Evan Halper, *Obama Will Use His Executive Authority to Impose New Permanent Bans on Offshore Drilling*, L.A. TIMES (Dec. 20, 2016, 7:55 PM), <http://www.latimes.com/nation/la-na-obama-offshore-drilling-20161220-story.html> [<https://perma.cc/Z7RP-W46K>].

22. U.S. BUREAU OF OCEAN ENERGY MGMT., ATLANTIC PERMIT APPLICATIONS, <https://www.boem.gov/Atlantic-Permit-Applications/> [<https://perma.cc/L4W2-3F9D>]; Merrit Kennedy, *Obama Designates Atlantic, Arctic Areas Off-Limits to Offshore Drilling*, NPR (Dec. 20, 2016, 5:36 PM), <http://www.npr.org/sections/thetwo-way/2016/12/20/506336885/obama-designates-atlantic-arctic-areas-off-limits-to-offshore-drilling>.

23. See *infra* Section IV.A.

24. *Understanding Geological & Geophysical Surveys*, IAGC, <http://www.iagc.org/geophysical-surveys.html> [<https://perma.cc/4P87-8JM3>].

25. *Id.*

26. *Id.*

Seismic sources can be used on land or in water.²⁷ There are two primary methods of locating oil and natural gas under the ocean floor that will be used by the companies seeking permits, should their applications become fully approved: gravity and magnetic methods; and two-dimensional (2D) seismic surveys.

A. Current Technology

The first method uses gravity and magnetic sources to narrow the range seismic sources are to be used in.²⁸ Gravity and magnetic survey technologies are not widely used alone, but these methods have existed since at least the 1970s.²⁹ They have been a useful technology in aiding oil and natural gas exploration.³⁰ Gravitational pull is used to detect “where the rocks underfoot are relatively dense and heavy, their extra gravitational attraction increases the downward pull and creates positive gravity anomalies.”³¹ These gravitational anomalies are then used to map the subterranean regions, indicating where oil and natural gas is located beneath the ocean floor.³² Magnetic methods are also being proposed to perform the same types of surveys.³³ The natural magnetization of rock formations is used to determine the location of those rocks and other ore.³⁴ However, there are many variables that can affect the magnetic fields, so magnetic surveys are almost always done in conjunction with other survey techniques.³⁵ One company that has already been granted a permit on the east coast will be using gravity and magnetic sources exclusively, but from an aerial source.³⁶ The data received through aerial collection is not as accurate as when it is collected from the surface of the water, but the method is efficient.³⁷

27. *Id.*

28. *Gravity and Magnetic Methods for Oil Exploration*, GEOSOFT, <http://www.geosoft.com/gravity-and-magnetic-modelling> [<https://perma.cc/Q6WN-KC7K>].

29. *Id.*; Henry Lyatsky, *Magnetic and Gravity Methods in Mineral Exploration: The Value of Well-Rounded Geophysical Skills*, 35 CSEG RECORDER 30, 30 (2010), https://csegrecorder.com/assets/pdfs/2010/2010-10-RECORDER-Magnetic_and_Gravity_Methods.pdf [<https://perma.cc/B4TH-F28V>].

30. GEOSOFT, *supra* note 28.

31. Lyatsky, *supra* note 29, at 31.

32. *Id.*

33. *Id.*

34. *Id.* at 30.

35. *Id.* at 31.

36. *Currently Submitted Atlantic OCS Region Permits*, BUREAU OCEAN ENERGY MGMT., <https://www.boem.gov/Currently-submitted-Atlantic-OCS-Region-Permits/> [<https://perma.cc/8K9M-JTCD>].

37. Lyatsky, *supra* note 29, at 32.

2D seismic data will be used by many permittees in conducting their east coast surveys.³⁸ To conduct these surveys, companies exploring for oil and natural gas under the sea floor tow hydrophones in a single line behind a vessel.³⁹ Compressed air is shot from an airgun attached to the vessel and into the water.⁴⁰ The energy and sound waves that bounce back are recorded by the hydrophones and later interpreted to map the likely location of oil and natural gas beneath the ocean floor.⁴¹ Since only one line of hydrophones is being used, a 2D image is created, as if to show a slice of the earth.⁴² Over the past few decades, three-dimensional (3D) surveys have been used as well.⁴³ Hydrophones are laid in a grid formation to capture more angles when the seismic source bounces back to the sensors.⁴⁴ 3D surveys are usually very accurate, but they are also expensive and considered trade secrets due to the level of detail they produce.⁴⁵ In fact, one company looking to conduct seismic surveys on the east coast signed an agreement with the federal government to ensure the data collected from the testing will not be disclosed to the public for twenty-five years.⁴⁶

B. *The Harm Caused by Seismic Blasting*

Marine mammals are substantially harmed by the introduction of seismic sources to the ocean. When noise pollution is added to the water, it interferes with a mammal's ability to perform basic functions, such as "finding mates, foraging, avoiding predators, navigating, and communicating."⁴⁷ With the exception of explosives, seismic sources produce the loudest noise pollution in the ocean.⁴⁸ Since the testing can last between weeks and months, marine mammals are driven away from their natural habitats, therefore, effecting the

38. See *Currently Submitted Atlantic OCS Region Permits*, *supra* note 36.

39. John McFarland, *How Do Seismic Surveys Work?*, OIL & GAS LAW BLOG (Apr. 15, 2009), <http://www.oilandgaslawyerblog.com/2009/04/how-do-seismic-surveys-work.html> [<https://perma.cc/Z7ZB-JYLY>]; *Seismic Survey*, APPEA, <http://seismicsurvey.com.au> [<https://perma.cc/QXV7-3BYX>].

40. APPEA, *supra* note 39.

41. *Id.*

42. McFarland, *supra* note 39.

43. *Id.*

44. *Id.*

45. *Id.*

46. Catherine Kozak, *Seismic Testing Q&A: The Pros and Cons*, COASTAL REV. ONLINE, <http://www.coastalreview.org/2016/05/14318/> [<https://perma.cc/G25L-2QDY>].

47. MICHAEL JASNY, NRDC, OCEAN FACTS: BOOM, BABY, BOOM: THE ENVIRONMENTAL IMPACTS OF SEISMIC SURVEYS (2010), <https://www.nrdc.org/sites/default/files/seismic.pdf> [<https://perma.cc/3FX6-T4GL>].

48. *Id.*

ecosystems they exist in.⁴⁹ Many whales have been shown to cease mating calls as a response to the noise caused by airgun blasts.⁵⁰ This effect on the natural functions of the marine mammals in the blast area in turn affects population size.⁵¹

Seismic airgun blasting also causes physical injuries to marine mammals past the inhibition of biological functions. The blasts have been described as “a blunt-force weapon” that can result in permanent hearing loss.⁵² Blasting has also been linked to marine mammal deaths in other parts of the world. In the fall of 2013, pilot whales beached themselves on the coasts of both Scotland and Iceland, resulting in at least 10 deaths of the 100 whales observed.⁵³ These strandings were thought to be a result of seismic surveys being conducted in the surrounding areas.⁵⁴ The affected whales displayed symptoms of confusion, stress, and a heightened state of panic.⁵⁵

III. COUNTERARGUMENTS

It is important to consider other interests and actors who have a stake in the seismic airgun game. The proponents of seismic airgun blasting have valid points as to why the testing should continue, but it is still hard to justify the harm caused, even with all the positives.

Companies have the desire to conduct surveys for oil and natural gas, even though there are no current lease sales planned on the eastern coast of the country, because none have been done since the 1980s.⁵⁶ Surveys of some sort, undoubtedly, need to be done in order to keep track of available resources. The oil industry overall has the potential to bring over 50,000 jobs and billions of dollars to the coastal cities with ports that will serve as a landing place for the boats and rigs involved in production.⁵⁷ Additionally, the federal government gets to keep all of the data and studies conducted by the

49. *Id.*

50. *Id.*

51. *Id.*

52. Andrea Germanos, *Seismic Blasting from Oil Drilling: Impacts on Marine Life, Whales, Dolphins*, GLOBAL RES. (Aug. 24, 2016), <http://www.globalresearch.ca/seismic-blasting-from-oil-drilling-impacts-on-marine-life-whales-dolphins/5542526> [<https://perma.cc/E8BQ-Y8CC>]; *Seismic Survey for Oil*, CTR. FOR BIOLOGICAL DIVERSITY, http://www.biologicaldiversity.org/campaigns/seismic_blasting/ [<https://perma.cc/3XM8-RMA2>].

53. Candace Calloway Whiting, *Panicked Whales Are Stranding in Area of Seismic Exploration*, HUFFINGTON POST (Sept. 13, 2013, 4:30 PM), http://www.huffingtonpost.com/candace-calloway-whiting/whales-in-trouble_b_3901423.html [<https://perma.cc/P8WS-3FGY>].

54. *Id.*

55. *Id.*

56. Kozak, *supra* note 46.

57. Mark Cares, *Pros and Cons of Offshore Drilling Decision*, STARNEWS (Aug. 15, 2014, 4:24 PM), <http://www.starnewsonline.com/opinion/20140815/pros-and-cons-of-offshore-drilling-decision> [<https://perma.cc/8KYM-QPD9>].

surveyors, saving taxpayer money to discover where energy resources are in the Atlantic Ocean.⁵⁸

Despite all of the benefits that come from the use of seismic sources, the positives do not outweigh the negatives when it comes to harm to the marine mammals affected by the blasts. The harm is even more pointless when there are other technologies available to the companies looking to conduct the surveys.

IV. LEGISLATIVE HISTORY

A. *The Marine Mammal Protection Act and Other Protective Statutes*

The MMPA was enacted in 1972 after concerns over depreciated marine species grew.⁵⁹ The goal was to prevent the “taking” of these mammals and preserve the balance in the ecosystems in which the mammals resided.⁶⁰ Whales, dolphins, porpoises, seals, and sea lions are all protected by the MMPA.⁶¹ The MMPA placed a prohibition on the take of certain marine mammals.⁶² The harassment, hunting, capture, killing, or attempt of the aforementioned activities, of a marine mammal all fit into the definition of a “take.”⁶³ Harassment falls into two categories: Level A and Level B.⁶⁴ Level A harassment arises when an activity “has the potential to injure a marine mammal or marine mammal stock in the wild.”⁶⁵ Level B harassment covers potential biological disruptions that would harm marine mammals, such as “migration, breathing, nursing, breeding, feeding, or sheltering.”⁶⁶ Although the statute calls for a “moratorium” on takes, permits may be granted for particular purposes, such as scientific research and commercial purposes.⁶⁷ The U.S. Secretary of Commerce may grant IHAs for incidental takes if certain prerequisites are

58. Kozak, *supra* note 46.

59. NOAA FISHERIES SERV., OFFICE OF PROTECTED RESOURCES AND THE MARINE MAMMAL PROTECTION ACT, http://www.nmfs.noaa.gov/pr/pdfs/mmpa_factsheet.pdf [<https://perma.cc/KZ5H-RSFS>].

60. *Id.*

61. *Id.*

62. *Id.*

63. 16 U.S.C. § 1362(13) (2012).

64. *Id.* § 1362(18)(C)-(D).

65. *Id.* § 1362(18)(A)(i), (C).

66. *Id.* § 1362(18)(A)(ii), (D).

67. *Id.* § 1362(8) (“[M]oratorium’ means a complete cessation of the taking of marine mammals and a complete ban on the importation into the United States of marine mammals and marine mammal products, except as provided in this chapter.”); NOAA FISHERIES SERV., *supra* note 59; *see also* 16 U.S.C. §§ 1371(a), 1374(a) (2012).

met.⁶⁸ Specifically, the proposed activity must not be commercial fishing, must be within a certain geographical region, only cause Level B harassment, and be open for public comment.⁶⁹ The IHAs may be granted if it is determined that the activity will only harass the marine mammals and the impacts are negligible.⁷⁰ The permits themselves must specify the number, kind, location, and manner in which the take will be occurring.⁷¹ The permit must also state “the period during which the permit is valid, and . . . any other terms or conditions which the Secretary deems appropriate.”⁷² In order to potentially be granted a permit for seismic airgun blasting, the requestor must move through a series of steps specified by BOEM.⁷³

The ESA, enacted in 1973, defines “take” almost identically to its MMPA counterpart. The ESA version reads: “The term ‘take’ means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.”⁷⁴ In *Babbitt v. Sweet Home Chapter*, the Supreme Court held in a 6-3 decision that a “harm” includes habitat modification that kills or injures wildlife.⁷⁵ The blasts from the airguns used in seismic surveys alters the ocean environment so much so that marine mammals suffer hearing loss as a result.⁷⁶ Additionally, whales and other marine mammals often change course to escape the blast zones. Seismic airgun blasting would be a foreseeable prohibited act under the ESA’s standards. Since certain animals are protected from takes by the ESA—whose definition is, arguably, the same as the MMPA—marine mammals should be afforded the same outright protections as the ESA’s protected species.

Airgun blasting permitting also triggers the National Environmental Policy Act (NEPA) process. The NEPA was first established in the late-1960s in order to require the federal government to take into account how projects will affect the environment.⁷⁷ When an activity will interfere with a certain act, such as the MMPA, the NEPA is triggered and the entity requesting the permit must take a hard

68. Small Takes of Marine Mammals Incidental to Specified Activities; Seismic Surveys in the Chukchi Sea off Alaska, 71 Fed. Reg. 49,418, 49,418-19 (Aug. 23, 2006) [hereinafter *Seismic Surveys in the Chukchi Sea off Alaska*].

69. *Id.*

70. *Id.* at 49,419.

71. 16 U.S.C. § 1374(b)(2)(A)-(D) (2012).

72. *Id.*

73. ATLANTIC G&G PERMITTING PROCESS, *supra* note 15.

74. 16 U.S.C. § 1532(19) (2012).

75. *Babbitt v. Sweet Home Chapter of Cmty. for a Great Or.*, 515 U.S. 687, 708 (1995).

76. *See* sources cited *supra* note 52.

77. *Summary of the National Environmental Policy Act*, EPA, <https://www.epa.gov/laws-regulations/summary-national-environmental-policy-act> [<https://perma.cc/QJV5-7FW8>].

look at the impacts that will potentially be caused by its activities.⁷⁸ Different levels of review are required for different activities: Categorical Exclusion Review (CER), Environmental Assessment (EA), and Environmental Impact Statement (EIS).⁷⁹

Categorical exclusions are standard activities that are generally known to have little to no environmental impacts.⁸⁰ An EA is a study in which the agency or other actor determines “whether or not a federal action has the potential to cause significant environmental effects.”⁸¹ EAs need to be prepared when the activity could harm species protected under the ESA, a new technology is being used, or the area itself is a sensitive environmental region.⁸² An EIS is a study that is either conducted right away, or following an EA, when a federal action is likely to have a significant impact on the environment.⁸³ The differences were clearly explained in *Sierra Club v. Epsy*:

An EIS must contain “a detailed statement of the expected adverse environmental consequences of an action, the resource commitments involved in it, and the alternatives to it.” An EA, on the other hand, is prepared in order to determine whether an EIS is required. An EA is a “rough-cut, low budget environmental impact statement” intended to determine whether environmental effects are significant enough to warrant preparation of an EIS. An EA must “include brief discussions of the need for the proposal, of alternatives . . . of the environmental impacts of the proposed action and alternatives, and a listing of agencies and persons consulted.” 40 C.F.R. § 1508.9(b).⁸⁴

An EIS is necessary if the impacts on the environment are unknown, the issue is controversial, or if the activity is part of a major federal action.⁸⁵ If the review from an EA comes back as insignificant or adverse yet not significant, then a Finding of No Significant Impact

78. See U.S. BUREAU OF OCEAN ENERGY MGMT., BUREAU OF OCEAN ENERGY MANAGEMENT GEOLOGICAL AND GEOPHYSICAL (G&G) WORKSHOP 83, <https://www.boem.gov/BOEM-IAGC-GandG-Workshop/> [https://perma.cc/2W6R-PAAP].

79. *Id.* at 84.

80. *Id.*

81. *National Environmental Policy Act Review Process*, EPA, <https://www.epa.gov/nepa/national-environmental-policy-act-review-process> [https://perma.cc/J4ML-UUU3] (last updated Jan. 24, 2017).

82. 40 C.F.R. § 1508.27 (2016); HEALTH RES. & SERVS. ADMIN., FAQ: NEPA ENVIRONMENTAL ASSESSMENTS, <https://bphc.hrsa.gov/policiesregulations/nepa.pdf> [https://perma.cc/77UC-6XY7].

83. *National Environmental Policy Act Review Process*, *supra* note 81.

84. *Sierra Club v. Epsy*, 38 F.3d 792, 802-03 (5th Cir. 1994) (citations omitted).

85. See U.S. BUREAU OF OCEAN ENERGY MGMT., ATLANTIC OCS: PROPOSED GEOLOGICAL AND GEOPHYSICAL ACTIVITIES, at v (2014), <https://www.boem.gov/BOEM-2014-001-v1/> [https://perma.cc/Z8XC-ZZQM]. This final EIS for proposed G&G activities, which includes offshore programs, lease sales, and programmatic coordination, “is a major Federal action requiring an EIS.” *Id.*

(FONSI) is issued.⁸⁶ Whether or not an EA is conducted, if the harm is “[p]otentially significant,” then an EIS should be prepared.⁸⁷ BOEM only requires an EA to supplement a permit application to use seismic airguns.⁸⁸

B. Legal Discussion

Although the specific issue of seismic airgun blasting has not been litigated on the east coast, there are two unreported cases from the Northern District of California that address the issue, and grant a TRO and a permanent injunction.⁸⁹ There are also two commentaries from the U.S. Department of Commerce (Commerce), the NOAA, and the National Marine Fisheries Service (NMFS) that talk about incidental takes on a smaller scale from similar testing.⁹⁰ However, since these comments only address mammals that stay in the water for short periods of time, such as seals, they are easily distinguishable from the current issues marine mammals face on the east coast. Marine mammals that must spend all of their time in the water are unable to, voluntarily, escape to the shore.

1. The West Coast

The United States District Court of Northern California has heard two cases regarding airgun blasting off the coast of northern California. Both cases are unreported, making them ideal for guidance on what other federal courts may do with a similar set of facts to the ones on the east coast.

The early-2000s case of *Center for Biological Diversity v. National Science Foundation* arose out of acoustic airgun research being conducted in the Gulf of California.⁹¹ The plaintiff in this case, Center for Biological Diversity, alleged that the permit granted to the defendant was a violation of the NEPA and the MMPA.⁹² Although the government was aware of the harms caused by seismic blasts produced by the twenty airguns on the defendant’s research vessel, the permit

86. *Geological and Geophysical (G&G) Workshop*, *supra* note 78, at 90.

87. *Id.*

88. *Id.* at 88.

89. *Haw. Cty. Green Party v. Evans*, No. C-03-0078 SC, 2003 WL 25289318, at *13 (N.D. Cal. Jan. 24, 2003); *Ctr. for Biological Diversity v. Nat’l Sc. Found.*, No. C-02-5065 JL, 2002 WL 31548073, at *10 (N.D. Cal. Oct. 30, 2002).

90. Seismic Surveys in the Chukchi Sea off Alaska, *supra* note 68, at 49,418-19; Incidental Takes of Marine Mammals During Specified Activities; Geophysical Surveys in South San Francisco Bay South of the Dumbarton Bridge, 71 Fed. Reg. 57,476, 57,476 (Sept. 29, 2006) [hereinafter *Geophysical Surveys in South San Francisco Bay South of the Dumbarton Bridge*].

91. 2002 WL 31548073, at *2.

92. *Id.* at *1.

was still issued and research began.⁹³ The government was using a decibel level even higher than the level concretely known to inflict “significant injury to marine mammals.”⁹⁴ The plaintiff requested a TRO to enjoin the defendant from continuing the research.⁹⁵ The court found that the plaintiff satisfied both prongs considered when a court is contemplating granting a TRO: (1) “probable success on the merits and the possibility of irreparable harm;” and (2) “that serious questions are raised and the balance of harm tips sharply in favor of the order.”⁹⁶ In regards to the first prong, the court determined that the defendant committed a take of the animals as prohibited by the MMPA and the plaintiff would likely have success on the merits of the case.⁹⁷ The court also held that the harm caused to animals that came in contact with the seismic sources was enough to grant the TRO.⁹⁸

When confronted with a similar issue to *Center for Biological Diversity v. National Science Foundation* less than a year later, the Northern District of California granted a permanent injunction in the case of *Hawai'i County Green Party v. Evans*.⁹⁹ The defendants in *Evans* were granted a series of permits allowing for airgun blasts for the purpose of, among other things, gauging the guns' effect on marine mammals.¹⁰⁰ It was known that these experiments would result in takes of marine mammals in the various bodies of water on both the Pacific and Atlantic Coasts.¹⁰¹ After being granted a TRO, the court heard the plaintiffs' motion for a preliminary injunction.¹⁰² The plaintiffs claimed that the defendants were granted the first amended permit because they listed an improper categorical exclusion, which violated the NEPA, and the court agreed.¹⁰³ If the first and third amended permits were allowed to continue without the proper NEPA analysis, the court reasoned, the harm caused by that permit would be irreparable.¹⁰⁴ The court also determined that the gray whale population was too low to risk a take of those mammals.¹⁰⁵

93. *Id.*

94. *Id.* at *3.

95. *Id.* at *1.

96. *Id.*

97. *See id.* at *2-3; *see also supra* Section IV.A.

98. *Ctr. For Biological Diversity*, 2002 WL 31548073, at *10.

99. *Haw. Cty. Green Party v. Evans*, No. C-03-0078 SC, 2003 WL 25289318, at *1 (N.D. Cal. Jan. 24, 2003).

100. *Id.* at *1-2.

101. *Id.* at *1.

102. *Id.* at *2. Proof of success on the merits and possibility of irreparable injury are both needed to win an injunction.

103. *Id.* at *11.

104. *Id.*

105. *Id.* at *12.

After weighing the harm that would come to the defendants if injunctive relief was granted, the court decided to issue the injunction.¹⁰⁶ Accordingly, the third amended permit was invalidated and NMFS was required to revoke certain activities in the first and third amended permits that would cause the most harm to the animals.¹⁰⁷

These cases are suggestive of the level of harm created by seismic airgun blasting. Parallels can be drawn between these cases and the present situation in the east coast waters. If a federal district court found that acoustic blasts were harmful enough to issue TROs in two different situations where the harm was the same or less than what marine mammals are currently facing in the Atlantic Ocean, then it would be reasonable for the federal courts along the east coast to decide cases in a similar way.

2. *The Department of Commerce Weighs In*

In late-2006, NOAA, NMFS, and Commerce issued two notices of issuance of IHAs.¹⁰⁸ As explained in the notices, two companies were interested in doing research off the coasts of California and Alaska.¹⁰⁹ However, this research was to be conducted using seismic sources, which causes a known take of marine mammals.¹¹⁰ The animals that would potentially face harm from the research were various species of sea lions, seals, porpoises, and whales, respectively.¹¹¹ Under MMPA section 101(a)(5)(D), a company applies for an IHA when it wishes to participate in an activity that will likely result in the take of a marine mammal.¹¹² The take will then be reclassified as an incidental take and permissible under the MMPA.¹¹³

An IHA may be granted if the activity is only taking place in a specific geographical region, or if the take is only harassment, and the proposal is open for public review.¹¹⁴ If the harassment will have a “negligible impact on the species or stock(s), will not have an un-

106. *Id.* The economic harm suffered by the scientist and the delay of research was not enough for the court to hold in favor the of the defendant.

107. *Id.* at *13.

108. *See* Seismic Surveys in the Chukchi Sea off Alaska, *supra* note 68, at 49,418; Geophysical Surveys in South San Francisco Bay South of the Dumbarton Bridge, *supra* note 90, at 57,476.

109. *See* Seismic Surveys in the Chukchi Sea off Alaska, *supra* note 68, at 49,419; Geophysical Surveys in South San Francisco Bay South of the Dumbarton Bridge, *supra* note 90, at 57,476-77.

110. *Supra* Section II.B.

111. *See* Geophysical Surveys in South San Francisco Bay South of the Dumbarton Bridge, *supra* note 90, at 57,477.

112. *Id.* at 57,476.

113. *Id.*

114. *Id.*

mitigable adverse impact on the availability of the species or stock(s) for subsistence uses and that the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such taking are set forth," the IHS shall be granted.¹¹⁵

While the research described in each notice seems similar to the present issues on the east coast at first glance, the differences become more evident with a harder look. The IHA authorized on September 29, 2006 (09/2006 Notice), can be distinguished from the blasting on the east coast by the technology used, the safeguards placed by NOAA, and the animals affected.¹¹⁶ The company seeking the application wanted to begin surveying San Francisco Bay in order to eventually build an underground pipeline.¹¹⁷ First, the technology to be used was considerably less harmful to the animals in the survey area.¹¹⁸ The company wanted to use "low intensity acoustic device[s]" for the seismic surveys.¹¹⁹ The acoustic devices differ from airgun blasting since they do not use blasting or a sonar source to perform the survey, but sound to locate oil and natural gas under the sea floor.¹²⁰ Next, the area that was to be surveyed was 25-35 linear miles, and the water was 45 feet deep at its deepest point. Compared to the 880 linear miles and 10,000-foot depth of the permitted areas of the new permits granted by NOAA and BOEM, the affected area discussed in the 09/2006 Notice was considerably limited.¹²¹ Another big difference with the activity to be conducted upon the granting of the 09/2006 Notice is the animals in the survey area and the potential effect on those animals. When opened up for comment, the proposed IHA received concerns about the seals and sea lions that lived

115. *Id.*

NMFS has defined "negligible impact" in 50 CFR 216.103 as "an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival." . . . MMPA defines "harassment" as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].

Id.

116. *Id.*

117. *Id.*

118. *Id.*

119. *Id.*

120. *Id.*

121. *Id.*; *Atlantic Permit Applications*, *supra* note 22..

in the Bay.¹²² These animals are able to retreat to land when blasting occurs, limiting the potential harm. Whales and other marine mammals that must stay in the water for survival do not have that luxury.¹²³

The other notice of issuance of IHA (08/2006 Notice) was published on August 23, 2006, also by NMFS, NOAA, and Commerce.¹²⁴ The 08/2006 Notice addressed more factually similar circumstances to the east coast, but with some significant differences that only time has revealed. GX Technology of Houston, Texas (GXT), wanted to use seismic airguns to survey the Chukchi Sea off the coast of Canada.¹²⁵ GXT requested the IHA because it knew that it would be committing a take of cetaceans or pinnipeds that came within a certain distance of the airgun blasts.¹²⁶ The 08/2006 Notice authorized incidental takes in an area of the sea that was 3,294.5 miles wide and 1,640 feet deep, making it more similar to the permitted and potentially permitted survey areas on the east coast.¹²⁷ The technology used then was also similar to the technology to be used in current and future surveys on the east coast.¹²⁸ However, in 2006 when the IHA was requested and granted, research had not yet revealed the true harms that could be caused by seismic airgun blasting. When faced with public comments regarding harms more significant than harassment, Commerce described the relationship as “tenuous at best.”¹²⁹ However, more current studies have shown that greater harm than just temporary impairments affect marine mammals when in the same area as seismic blasts.¹³⁰ Despite the similarities between the technology and water body affected on the east coast and the 08/2006 Notice, the current research shows that harms on marine mammals, such as whales, is much more significant than previously believed, limiting the precedential value of this IHA for new agency decisionmaking.

Although the IHAs discussed allowed for the incidental take of marine mammals in various locations on the west coast of the United States and Canada, IHAs would not practically work on the east

122. Geophysical Surveys in South San Francisco Bay South of the Dumbarton Bridge, *supra* note 90, at 57,477. Porpoises and whales were mentioned, too, but those animals are not regularly found in the San Francisco Bay. *See id.*

123. *Id.*

124. Seismic Surveys in the Chukchi Sea off Alaska, *supra* note 68, at 49,418.

125. *See id.* at 49,418-19.

126. *Id.* at 49,419. Whales and seals would have been impacted as well.

127. *Id.*; *Atlantic Permit Applications*, *supra* note 22.

128. Seismic Surveys in the Chukchi Sea off Alaska, *supra* note 68, at 49,419; *see supra* Section II.A.

129. Seismic Surveys in the Chukchi Sea off Alaska, *supra* note 68, at 49,421.

130. *See supra* Section II.B.

coast. The harm is more significant than harassment, and the impacts are greater than negligible.¹³¹ The technology referenced in both notices were drastically different and much less harmful to the marine mammals. The acoustic survey to be conducted according to the 09/2006 Notice was also done in a smaller area off of the east coast and in shallower water than the surveys on the east coast, allowing for better monitoring of animals. The airguns used by the companies conducting tests on the east coast are more powerful and fire more often than the acoustic and airgun devices used in the studies in the west coast waters.¹³² Whales are predominantly affected by the blasts on the east coast and those mammals are not as easily able to escape the blasting area as seals and sea lions, which can retreat to land. The 08/2006 Notice can give some guidance on mitigation practices, but it should not be weighed very heavily because the research Commerce depended on is now out-of-date.¹³³

As previously addressed, there is indication that there are Level A harms resulting from the use of seismic sources. Since IHAs only cover Level B harms, more research needs to be conducted to be sure companies are not acting outside of the IHAs. Without a complete view of the effects seismic sources have on marine mammals, a TRO must be issued to pause surveys using those sources.

V. GUIDANCE FROM *WINTER V. NATURAL RESOURCES DEFENSE COUNCIL*

The case of *Winter v. Natural Resources Defense Council* was decided by the United States Supreme Court in 2008 by a 5-4 vote.¹³⁴ Although this case was about the U.S. Navy and sonar testing for training purposes, it gives guidance on how agencies should consider airgun blasting as well. If faced with similar facts, an east coast court should see *Winter* as a case in which great deference was given for the sake of national security, but not much more.

A. *Background and Issue*

“Strike groups” are submarines, ships, and aircrafts deployed by the Navy to surround aircraft carriers.¹³⁵ The servicemen and servicewomen entrusted with this task must go through intense training to prepare for any potential threats that may arise at sea.¹³⁶ At the

131. See Seismic Surveys in the Chukchi Sea off Alaska, *supra* note 68, at 49,421 (explaining how to get an IHA).

132. *Seismic Airgun Blasting: Overview*, *supra* note 1.

133. See Seismic Surveys in the Chukchi Sea off Alaska, *supra* note 68, at 49,423-24.

134. *Winter v. Nat. Res. Def. Council, Inc.*, 555 U.S. 7, 7 (2008).

135. *Id.* at 12.

136. *Id.*

time of the case, “[a]ntisubmarine warfare” was a main focus of this training due to the challenges of detecting adversarial, nearly silent, diesel-electric submarines.¹³⁷ According to the Navy, the best way to detect submarines using this new technology was by using “mid-frequency active” (MFA) sonar.¹³⁸ This technology emits pulses of sound, which in turn bounce off an object and come back to the source of the sonar.¹³⁹ This technology can give the exact distance of an object, regardless of how loud or quiet the object is.¹⁴⁰ Due to the complexity of operating MFA sonar devices, the Navy often conducts real-time trainings of the technology.¹⁴¹

The Navy found that the southern California coast was the best location for these tests because of the variety of naval bases in the area.¹⁴² Before strike groups can be deployed, they must show the ability to operate in realistic, stressful situations, including “detecting, tracking, and neutralizing enemy submarines” using MFA sonar.¹⁴³ With around forty species of marine mammals inhabiting the waters of southern California, this testing drew concerns from a number of environmental groups.¹⁴⁴ MFA sonar had potentially harmful effects on the marine mammals in the area, including “permanent hearing loss, decompression sickness, and major behavioral disruptions.”¹⁴⁵ The Navy countered that in its forty years of conducting these tests, it was not aware of any serious harm caused by its use of sonar.¹⁴⁶

Although the MMPA prohibits takes of marine mammals, the U.S. Deputy Secretary of Defense exempted the Navy from these provisions because the Secretary considered the training “necessary for national defense.”¹⁴⁷ However, the exemption was made on the condition that the Navy would make efforts in mitigating potential harms to marine mammals, including lookouts stationed specifically to watch for mammals and decreasing the decibels produced by the sonar if a mammal was detected.¹⁴⁸

137. *Id.* at 12-13.

138. *Id.* at 13.

139. *Id.*

140. *Id.*

141. *Id.*

142. *Id.* at 13-14.

143. *Id.* at 14.

144. *Id.*

145. *Id.*

146. *Id.*

147. *Id.* at 15.

148. *Id.* at 15.

Another issue in *Winter* arose out of the fact that the Navy decided not to file an EIS.¹⁴⁹ The plaintiffs argued that this neglect was a direct violation of the NEPA.¹⁵⁰ Under the NEPA, agencies are required to prepare an EIS if a federal project will have a major effect on the environment.¹⁵¹ But if after doing a simpler EA it is shown that environmental impacts are likely minimal, an EIS is not required.¹⁵² In the Navy's EA of the 14 training exercises it had planned, it only predicted 14 "Level A harassment[s]" (physical injuries) and 274 "Level B harassment[s]" (temporary injuries).¹⁵³

The district court granted a preliminary injunction in favor of the plaintiffs, noting that plaintiffs would probably succeed in their claim that the Navy violated the NEPA and the Coastal Zone Management Act (CZMA).¹⁵⁴ The district court also decided that equitable relief was appropriate because there was a very high likelihood of permanent harm to the environment, and that this harm was worse than the harm the Navy would possibly suffer by not being able to complete the trainings.¹⁵⁵ The Ninth Circuit Court of Appeals agreed that an injunction was appropriate, but remanded the case back to the district court because the injunction was too broad.¹⁵⁶ The district court added the following conditions to the injunction:

- (1) imposing a 12 nautical mile "exclusion zone" from the coastline;
- (2) using lookouts to conduct additional monitoring for marine mammals;
- (3) restricting the use of "helicopter-dipping" sonar;
- (4) limiting the use of MFA sonar in geographic "choke points";
- (5) shutting down MFA sonar when a marine mammal is spotted within 2,200 yards of a vessel; and
- (6) powering down MFA sonar by 6 dB during significant surface ducting conditions, in which sound travels further than it otherwise would due to temperature differences in adjacent layers of water.¹⁵⁷

The Navy appealed to the President of the United States in opposition to the fifth and sixth restrictions.¹⁵⁸ The President determined that the tests were "essential to national security" and that the training and tests were absolutely necessary.¹⁵⁹ The Council on Environmental Quality (CEQ) also weighed in and allowed some leniency to

149. 42 U.S.C. § 4331 (1982); *Winter*, 555 U.S. at 15-16.

150. *Winter*, 555 U.S. at 15-16.

151. *Id.* at 16.

152. *Id.*

153. *Id.*

154. 16 U.S.C. § 1452 (1992); *Winter*, 555 U.S. at 16-17.

155. *Winter*, 555 U.S. at 17.

156. *Id.*

157. *Id.* at 17-18.

158. *Id.* at 18.

159. *Id.*

the NEPA requirements imposed on the Navy.¹⁶⁰ The CEQ determined that the restrictions would make it very difficult for the strike groups to be adequately prepared for missions.¹⁶¹ The CEQ allowed the Navy to go ahead with their training under the original mitigating factors proposed when the U.S. Deputy Secretary of State exempted them from the MMPA, but new research and reporting requirements were added.¹⁶²

The Navy then appealed the 2,200-yard restriction, initially imposed by the lower court, on remand.¹⁶³ But the Ninth Circuit kept the restriction because it did not believe that the CEQ had found a true “emergency” under the circumstances.¹⁶⁴ The Ninth Circuit held to its opinion that the Navy’s EA “was ‘ cursory, unsupported by cited evidence, or unconvincing.’ ”¹⁶⁵ The Ninth Circuit also held that the 2,200-yard restrictive zone was reasonable because the MFA sonar was not constantly running during trainings and the conditions for which the power-downs would be necessary are rare.¹⁶⁶ The Navy appealed the Ninth Circuit’s decision to the United States Supreme Court.¹⁶⁷

B. *Holding and Reasoning*

The Supreme Court held that a preliminary injunction was inappropriate and premature based on the circumstances.¹⁶⁸ The injunction should not have been granted on the “possibility” of negative impacts.¹⁶⁹ Additionally, the Court pointed out that an EIS is only required when the environmental impacts are unknown.¹⁷⁰ Because the Navy had been conducting these types of exercises in the southern California area for forty years, the Court reasoned that this data was adequate under the NEPA.¹⁷¹

A preliminary injunction is either granted or denied after the court weighs the competing interests of both parties.¹⁷² These competing interests include the effects and harms that may come as a result

160. *Id.*

161. *Id.* at 18-19.

162. *Id.* at 19.

163. *Id.*

164. *Id.*

165. *Id.*

166. *Id.* at 20.

167. *Id.*

168. *Id.* at 25-26.

169. *Id.* at 22-23.

170. *Id.* at 23.

171. *Id.*

172. *Id.* at 24.

of the granting or withholding of the injunction.¹⁷³ Because *Winter* involved highly technical defense interests, the Court deferred to the special knowledge of the Navy officers.¹⁷⁴ The decision was clear to the majority of the Court:

The public interest in conducting training exercises with active sonar under realistic conditions plainly outweighs the interests advanced by the plaintiffs. Of course, military interests do not always trump other considerations, and we have not held that they do. In this case, however, the proper determination of where the public interest lies does not strike us as a close question.¹⁷⁵

One of the most unique features of *Winter* was the resolution of the National Resource Defense Council's CZMA claim. For the first and only time in history, the Court used the Presidential override to allow the Navy to conduct their trainings, even though those actions violated the CZMA.¹⁷⁶ This extraordinary use of power suggests that the unique circumstances of the case will likely not be easily replicated. Also, the use of the override shows the substantial deference that is shown to the military when acting on behalf of national defense. This deference simply cannot be expanded to companies looking to survey what possible oil and natural gas lies beneath the ocean floor, especially when potential lease-sales of the area are years away.¹⁷⁷

C. *Application to the Current State of Seismic Airgun Blasting*

Because *Winter* was about the Navy and national security by extension, it can be easily distinguished from what is happening on the east coast with seismic airgun blasting. As the Supreme Court stated in its decision, the issue of national security is of great importance.¹⁷⁸ While exploring for oil is important for future energy production, it is not imperative to explore for oil at this time since drilling talks have ceased.¹⁷⁹ There are other oil and natural gas sources in the United States, in addition to the option to import oil from other countries.¹⁸⁰ Additionally, other energy sources are constantly being developed

173. *Id.*

174. *Id.* at 24-25.

175. *Id.* at 26.

176. *Id.* at 18.

177. *Id.*

178. *Id.*

179. Brad Rich, *Seismic Testing Remains an Issue for East Coast*, TIDELAND NEWS (Mar. 30, 2016, 9:31 AM), http://www.carolinacoastonline.com/tideland_news/news/article_adac2856-f67b-11e5-9400-a7ecbdcf13e7.html [<https://perma.cc/GQ7V-MHB5>].

180. *Crude Oil Production*, EIA (Jan. 31, 2017), https://www.eia.gov/dnav/pet/pet_crd_crpdn_adc_mbbldpd_a.htm [<https://perma.cc/A78P-W4H8>]; *U.S. Natural Gas Imports & Exports 2015*, EIA (May 31, 2016), <https://www.eia.gov/naturalgas/importsexports/annual/> [<https://perma.cc/W3BA-JHPK>].

and expanded upon.¹⁸¹ So oil and natural gas is not the only option for energy in this country. Money-making interests, while valid for the oil companies, do not hold the same weight as national security; and the competing public interest to protect the marine wildlife from these seismic sources should be paramount.

VI. ALTERNATIVES TO SEISMIC AIRGUN BLASTING

A. *Viable Technologies*

The Commerce notice comments inspire this next Part regarding the possibility of introducing technologies that are less harmful to the marine mammals in permitted testing areas, yet still effective for companies looking to locate oil and natural gas.¹⁸² There is new technology being developed and technology that is already in use that is known to be effective, just not as widely used.

One of the newer technologies is ambient seismic field noise-correlation tomography (ASNT).¹⁸³ This method uses sensors embedded on the sea floor to track the natural seismic waves generated from the flow of the ocean.¹⁸⁴ Although the installation of the sensors will disrupt the environment on the ocean floor, it is a one-time disturbance as opposed to the constant blasts of airguns. Another method that has proven to be effective is gravitational sources.¹⁸⁵ Gravity surveys are among the types of sources that companies are planning to use in the Atlantic survey projects.¹⁸⁶ The use of gravity to map oil and natural gas under the ocean floor is a proven method that has only gotten more accurate over the years.¹⁸⁷

B. *Monitoring Technologies*

There is a new monitoring technology that the Environmental Protection Agency is developing to monitor pollution levels without physical oversight. This technology is called “Next Generation Compliance,” and it can give us a glimpse of what can possibly be done in the realm of seismic source surveying.¹⁸⁸ Some challenges to the

181. *New Energy for America*, BUREAU LAND MGMT., <https://www.blm.gov/programs/energy-and-minerals/renewable-energy> [<https://perma.cc/FM34-5N7Y>].

182. *See supra* Section IV.B.2.

183. Than, *supra* note 14.

184. *Id.*

185. *Gravity and Magnetic Methods for Oil Exploration*, *supra* note 28.

186. *See supra* Section II.A.

187. *Id.*; NOAA, EFFECTS OF OIL AND GAS ACTIVITIES IN THE ARCTIC OCEAN: SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT § 2.3.2.9 (2013), http://www.nmfs.noaa.gov/pr/permits/eis/arctic_sdeis.pdf [<https://perma.cc/KS6L-ADGR>].

188. *Next Generation Compliance*, EPA, <https://www.epa.gov/compliance/next-generation-compliance> [<https://perma.cc/6SEF-V792>] (last updated Feb. 14, 2017).

technology are the size of the ocean and the type of “pollution” that is being monitored. But, if innovative monitoring systems like Next Generation Compliance can be used, BOEM will be in a better position to carry out its mission: “[T]he Bureau of Ocean Energy Management is to manage development of U.S. Outer Continental Shelf energy and mineral resources in an environmentally and economically responsible way.”¹⁸⁹

VII. CONCLUSION

With the indication that seismic sources cause more than behavioral changes to the marine mammals that come into their ranges and other technology available to use in place of seismic sources, a TRO on those sources is necessary. During 2014 and 2015, the United States Geological Survey (USGS), as part of the United States Department of Interior, conducted research on the effects of seismic sources on the environment.¹⁹⁰ However, based on the findings on the west coast, an EIS needs to be completed to wholly rule out Level A harassment. Companies are only required to conduct EAs to be considered for a seismic survey permit.¹⁹¹ Since every EA concludes in a FONSI, it is unclear if the harms to mammals will ever be known to their fullest extent.¹⁹² This Note proposes that an agency, such as USGS, NOAA, or BOEM, should conduct new research, as USGS did with its EA in response to the 2014 executive order. Since over nine companies will potentially have the permits and IHAs necessary to conduct seismic surveys, one governmental agency conducting the research of environmental impacts would logically streamline the process. Until an EIS is conducted, a TRO against use of all seismic sources should be issued.

This Note also suggests that only non-seismic sources should be used to survey the ocean for oil and natural gas until an EIS is complete. These technologies have little to no impact on marine mammals as they do not have a long-term effect on the environment. If companies do not like this option, they can also choose to wait until the surveys are actually necessary. It is reasonable that companies would want to conduct surveys before bidding on drilling rights on the east coast of the United States. The surveying process can take a

189. *About BOEM*, BUREAU OCEAN ENERGY MGMT., <http://www.boem.gov/About-BOEM/> [<https://perma.cc/88MZ-6G34>].

190. RPS EVAN-HAMILTON INC., DRAFT ENVIRONMENTAL ASSESSMENT FOR SEISMIC REFLECTION SCIENTIFIC RESEARCH SURVEYS DURING 2014 AND 2015 IN SUPPORT OF MAPPING THE US ATLANTIC SEABOARD EXTENDED CONTINENTAL MARGIN AND INVESTIGATING TSUNAMI HAZARDS (2014), https://woodshole.er.usgs.gov/project-pages/environmental_compliance/reports/USGS_Atlantic_draft_EA_May_2014.pdf [<https://perma.cc/U98H-M5T9>].

191. *Geological and Geophysical (G&G) Workshop*, *supra* note 78, at 88.

192. *Currently Submitted Atlantic OCS Region Permits*, *supra* note 36.

significant amount of time, with many months spent on planning, conducting surveys, and interpreting data. But with a moratorium on drilling until at least 2021, the use of seismic sources is not imperative this soon.¹⁹³

Later, if the EIS still concludes that the impacts on marine mammals are strictly Level B, it can be business as usual for the companies that wish to survey. With safeguards in place to mitigate harms, marine mammals will be as adequately protected as possible. However, if the EIS reveals the harms are beyond the Level B harassments covered by IHAs, a permanent injunction will be the only option to protect the ecosystem inhabited by the creatures most affected by the blasts.

193. Jennifer A. Dlouhy, *Obama Bars Atlantic Offshore Oil Drilling in Policy Reversal*, BLOOMBERG (Mar. 15, 2016, 7:31 AM), <http://www.bloomberg.com/news/articles/2016-03-15/obama-said-to-bar-atlantic-coast-oil-drilling-in-policy-reversal> [<https://perma.cc/LCZ5-CEB6>].

