

IT TAKES A VILLAGE: REPURPOSING TAKINGS DOCTRINE TO ADDRESS MELTING PERMAFROST IN ALASKA NATIVE TOWNS

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ABSTRACT

Dozens of Alaska Native villages face an existential crisis as Alaska's permafrost melts, causing soil erosion and instability. Adapting to these rapidly changing conditions is unworkable, so most villages will have to physically move to locations atop bedrock. The estimated costs for these moves are enormous, and not even the combination of available federal and state administrative resources can adequately cover them. One possible avenue for funding is a state inverse condemnation regulatory takings claim, which posits that state action has caused the property destruction in the villages. Alaska has a unique relationship to its oil extraction industry, which has demonstrably contributed to global climate change, the main cause of the permafrost melt. To facilitate a potential takings claim, this Note presents two possible avenues for argument: a "direct approach" that focuses only on state oil leases as government action and a "hybrid approach" that instead considers the leases as part of a more holistic investment by the state in its oil. This Note also considers the shortcomings of the overall takings strategy, along with the potential for its use in response to other cases of environmentally related property destruction.

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I. INTRODUCTION

The Fifth Amendment to the United States Constitution states that “private property [shall not] be taken for public use, without just compensation.”¹ At the beginning of the twentieth century, this doctrine was further expanded to encompass regulatory takings.² This means that, even when no physical invasion has occurred, government activity, typically in the form of regulation, may become so burdensome that it effectively deprives certain landowners of the use of their land.³ In recent jurisprudence, regulatory takings doctrine has been placed in direct conflict with environmental protection and the broader movement to fight the effects of climate change.⁴

But with ecological collapse and global system disruption becoming more present and obvious by the minute, actions taken by both the U.S. government and individual states present an opportunity to link these problems to their source. While part of the legal community continues searching for ways to preempt impending climate catastrophe, regulatory takings doctrine may present a possible avenue for relief where environmental destruction is imminent or already occurring.

This Note begins in Part II with a discussion of how permafrost melt is making some Alaska Native villages in northern and western Alaska unlivable. Town relocation is the only viable option for most of these villages, but the administrative resources that exist to support infrastructure development and redevelopment are inadequate.⁵ Seeking a legal alternative, this Note sets out one possible way to utilize takings doctrine to respond to the property destruction wrought by permafrost melt. Specifically, this Note walks through the steps required to make an inverse condemnation takings claim against the State of Alaska. As discussed in Part III, inverse condemnation is a term used to describe the restitution that plaintiffs may seek after state action has taken property

1. U.S. CONST. amend. V.

2. See Kirsten Engle, *Taking Risks: Executive Order 12,630 and Environmental Health and Safety Regulation*, 14 VT. L. REV. 213, 241 (1989) (“Prior to *Mahon*, the Court adhered to the view that regulatory measures designed to prevent a noxious use could not effect a taking.”).

3. See *Pa. Coal Co. v. Mahon*, 260 U.S. 393, 415 (1922) (“[W]hile property may be regulated to a certain extent, if regulation goes too far it will be recognized as a taking.”).

4. See Mark Nevitt, *As We Adapt to Climate Change, Legal Doctrine Must Also Adapt*, THE WHARTON SCH. RISK MGMT. & DECISION PROCESSES CTR., <https://riskcenter.wharton.upenn.edu/climate-risk-solutions-2/legal-doctrine-must-also-adapt/> (last visited Oct. 24, 2021) (“[F]ederal, state, and local climate adaptation measures must be careful to not run afoul of the Regulatory Takings doctrine.”).

5. See *infra* Part II.

from them for public use, while diminishing the property's value in the process.⁶ Part III also describes how several different takings analyses have developed since the ratification of the U.S. Constitution, but due to Alaska's narrow interpretation of per se takings, plaintiffs will likely need to demonstrate that the inverse condemnation satisfies the ad hoc test developed in *Anchorage v. Sandberg*.⁷

Next, Part IV describes how, because Alaska both directly and indirectly invested so heavily in its oil extraction industry, a potential plaintiff may argue that this decades-long venture constitutes state action. Then, Part V delves into the establishment of causation. To build the causal chain, science-backed data show that oil extracted from Alaska and burned within and outside of the state has been a tangible contributor to the greenhouse effect and the resulting rise in global temperatures, causing permafrost melt, and culminating in the eventual destruction of Alaska Native villages.

Further, Parts VI and VII lay out how Alaska's proximate cause standard for inverse condemnation has loosened in recent decades, but how the steps in the causal chain and the required reliance on approximated contributions to climate change, combined with American courts' aversion to directly addressing climate change issues, present a formidable barrier to success. Part VII also addresses the reality that takings law only permits restitution for private property destruction and will not account for destroyed roads, airports, or schools, meaning that this strategy cannot singlehandedly address the financing challenges Alaska Native villages face.

To conclude, Part VIII recognizes that, today, this argument is unlikely to succeed in Alaska's courts. However, with incremental gains for individuals and organizations filing suit in state and federal courts for government-sponsored climate destruction, this avenue may open up in Alaska in the not-too-distant future. Moreover, this strategy has the potential to translate to other legal actions addressing environmental issues throughout the country.

6. See *Beeson v. City of Palmer*, 370 P.3d 1084, 1088 (Alaska 2016) ("A party alleging inverse condemnation must establish the following elements: (1) a taking or damaging of private property (2) proximately caused by a government entity (3) exercising power in the public interest without formal condemnation proceedings.").

7. 861 P.2d 554, 557 (Alaska 1993).

II. PERMAFROST MELT AND ITS EFFECTS ON ALASKA NATIVE VILLAGES

Alaska's geographical and hydrological conditions are relatively unique in the United States but are consistent with those throughout communities in the northern and southern land extremities of the globe.⁸ Significant portions of the state sit on permafrost, defined as ground that has remained below thirty-two degrees Fahrenheit for two years or more.⁹ In total, nearly five million people around the world live upon permafrost, a small but notable minority of whom live in Alaska.¹⁰ It is estimated that eighty percent of Alaska's land has permafrost beneath it.¹¹ Much of the permafrost in Alaska has been frozen for thousands of years and can be hundreds of feet thick.¹² The permanent frozen conditions can create a virtual bedrock of solid ground on which people can build settlements.¹³ However, there are numerous challenges posed by these buildings, especially with heating, which may cause near-surface ice to melt.¹⁴ These issues are not new, as Alaska Native groups have had thousands of years of experience developing strategies to live on the permanently frozen ground.¹⁵

Global climate change, associated with rising global air and water temperatures, is causing unprecedented permafrost melt that only promises to worsen.¹⁶ This melting reduces the ice composition of the ground, causing the soil to lose its active top layer and creating embankment erosion.¹⁷ The soil itself grows unstable and roads and

8. *All About Frozen Ground: Where Is It?*, NAT'L SNOW & ICE DATA CTR., https://nsidc.org/cryosphere/frozenground/whereis_fg.html (last visited Jan. 18, 2022) (citing Alaska as one of the only states containing permafrost, but among several global regions).

9. *Id.*

10. Justine Ramage et al., *Population Living on Permafrost in the Arctic*, 43 *POPULATION & ENV'T* 22, 27 (2021).

11. ENV'T PROT. AGENCY, *ADAPTING TO CLIMATE CHANGE ALASKA*, at 2 (2016), https://www.epa.gov/sites/default/files/2016-07/documents/alaska_fact_sheet.pdf.

12. NAT'L OCEANIC & ATMOSPHERIC ADMIN., *ARCTIC CHANGE: LAND - PERMAFROST*, <https://www.pmel.noaa.gov/arctic-zone/detect/land-permafrost.shtml>.

13. *All About Frozen Ground: People and Frozen Ground*, NAT'L SNOW & ICE DATA CTR., <https://nsidc.org/cryosphere/frozenground/people.html> (last visited Dec. 15, 2021).

14. *Id.*

15. *All About Arctic Climatology and Meteorology: Arctic People*, NAT'L SNOW & ICE DATA CTR., <https://nsidc.org/cryosphere/arctic-meteorology/arctic-people.html> (last visited Apr. 14, 2022).

16. ENV'T PROT. AGENCY, *supra* note 11; see also discussion *infra* Section (V)(A).

17. Blake Gentry, *Native Peoples and Permafrost in Alaska*, THE HIGHER GROUND FOUND. (last updated Apr. 9, 2020),

buildings begin to crack or even collapse without structural support.¹⁸ For whole communities built atop permafrost, liquification of the ice can be disastrous.¹⁹ The effects go far beyond the integrity of building foundations, threatening water quality, river and stream discharge, and habitats for fish and wildlife.²⁰

The erosion caused by permafrost melt alone presents significant danger to Alaska Native villages, but arctic sea melt, another direct result of rising global temperatures, further exacerbates this danger.²¹ Larger storm surges, driven by climate change, accelerate erosion where permafrost has melted.²² These factors put villages on the coast at even greater risk of severe damage.

Organizations like the Cold Climate Housing Research Center in Fairbanks, Alaska, have recommended avoiding building on permafrost and offered suggestions and solutions for pre-construction planning for those planning to build on it anyway.²³ These include constructing adjustable foundation piers, ventilated crawlspaces, and refrigerated supports.²⁴ However, for those already upon the permafrost, few realistic options exist. Publicly available instructions for retrofitting individual

<https://www.thehighergroundfoundation.org/post/ii-native-peoples-and-permafrost-in-alaska>.

18. See, e.g., Svetlana Skarbo, *Building Breaks in Middle and Collapses 10 Metres as Thawing Permafrost No Longer Supports Stilts*, THE SIBERIAN TIMES (Apr. 6, 2021), https://siberiantimes.com/other/others/news/building-breaks-in-middle-and-collapses-10-metres-as-thawing-permafrost-no-longer-supports-stilts/?comm_order=best; Chris Baraniuk, *The Fragile Future of Roads and Buildings Built on Permafrost*, BRIT. BROAD. CO. (Mar. 4, 2021), <https://www.bbc.com/future/article/20210303-the-unsure-future-of-roads-and-buildings-on-melting-ground>.

19. See Ramage et al., *supra* note 10, at 23 (“The changing environmental conditions not only affect people by damaging infrastructure but also impact the livelihoods and cultural activities of the populations living on permafrost.”).

20. Carl Markon et al., *Alaska*, in IMPACTS, RISKS, AND ADAPTATION IN THE UNITED STATES: FOURTH NATIONAL CLIMATE ASSESSMENT, VOLUME II, 1185, 1188 (2018),

https://nca2018.globalchange.gov/downloads/NCA4_Ch26_Alaska_Full.pdf.

21. NAT’L OCEANIC & ATMOSPHERIC ADMIN., ARCTIC REPORT CARD 2020, https://arctic.noaa.gov/Portals/7/ArcticReportCard/Documents/ArcticReportCard_full_report2020.pdf?ver=2020-12-08-151255-807.

22. Susan Nerberg, *Meltdown – The Permafrost That Holds the Arctic Together Is Falling Apart*, THE ARCTIC INST. (Mar. 2, 2021), <https://www.thearcticinstitute.org/meltdown-permafrost-arctic-together-falling-apart/>.

23. See ENV’T PROT. AGENCY, *supra* note 11, at 2 (“The Cold Climate Housing Research Center . . . advised businesses and residents to avoid building on permafrost [and] designs homes with adjustable foundation piers, which can be adjusted if permafrost conditions deteriorate.”).

24. *Permafrost Foundations*, COLD CLIMATE HOUS. RSCH. CTR., <http://cchrc.org/permafrost-foundations-2/> (last visited Oct. 15, 2021).

buildings built on melting permafrost have not been updated since 2001, and those instructions describe a long and expensive process of investigative drilling followed by installation of either large amounts of insulation or complicated systems to keep the ground frozen.²⁵ Retrofitting is therefore challenging for single buildings and completely unrealistic for entire villages.

The combination of storm surge and melting permafrost threatens to decimate coastal towns like Newtok (Niugtaq in Central Yup'ik language), Alaska, a village of Qaluyaarmiut, the "dip net people," who follow a subsistence way of life.²⁶ The Qaluyaarmiut have lived on or near this site for roughly two thousand years.²⁷ From 1983 to 2013, the eroding shoreline lost between nineteen and eighty-eight feet per year, putting some houses within a hundred feet of the frigid Ninglick River.²⁸

After considering every conceivable option, Newtok began a program in the 1990s to move the town.²⁹ This required lobbying Congress to approve a transfer from the U.S. Fish & Wildlife Service for land that sits atop bedrock nine miles away; hiring a consulting firm; and constructing a new marina, a new school, and, of course, new houses at the site.³⁰ On October 15, 2019, after three decades of planning, one-third of the village moved to the new site, Mertavik, making it the first Alaska Native village to officially relocate due to melting permafrost and climate change.³¹ However, despite all of the time and effort put into making the transition, two months after the move, there was no running water in the new school, the interiors of the homes were left unfinished, the power plant was incomplete, and the construction of the health clinic was

25. See *Design Manual for Stabilizing Foundations on Permafrost*, COLD CLIMATE HOUS. RSCH. CTR. (2001), <http://cchrc.org/media/DesignManualforStabilizingFoundationsonPermafrost.pdf>.

26. *The Village – Newtok*, RELOCATE NEWTOK, <https://relocatenewtok.org/about/> (last visited Oct. 24, 2021).

27. *Id.*

28. See *id.* ("One longtime resident remarked that as a child she couldn't see water from her house at the edge of the village, not even if she squinted. Now, the river water laps menacingly just 80 feet from her back porch. Her home will be one of the first to go.")

29. *Newtok Planning Group, Newtok Village Relocation History: Part Two: Early Efforts to Address Erosion*, ALASKA DEPT. OF COM., CMTY., & ECON. DEV., <https://www.commerce.alaska.gov/web/dcra/PlanningLandManagement/NewtokPlanningGroup/NewtokVillageRelocationHistory/NewtokHistoryPartTwo.aspx> (last visited Feb. 21, 2022) [hereinafter *Newtok Relocation History*].

30. *Newtok's Land Exchange and Relocation*, UNIV. OF ALASKA FAIRBANKS: ADAPT ALASKA, <https://adaptalaska.org/case-study/newtoks-land-exchange-and-relocation/> (last visited Mar. 5, 2022); Gentry, *supra* note 17.

31. Gentry, *supra* note 17.

ongoing.³² The Newtok relocation plan demonstrates how such relocation is possible, but it also shows the major costs and risks. The initial stages of evaluation began in 1983 and it took thirty-six years from these first assessments of potential damages to move only one-third of the town.³³ That amount of time allowed Newtok to receive funding from the Alaska legislature for the initial assessment, as well as from the Bureau of Indian Affairs and the U.S. Army Corps of Engineers (“Corps”) for the planning and construction itself.³⁴ Part of the relocation’s success was also the result of political pressure from Alaska’s congressional delegation, which supported and passed federal legislation approving the acquisition of the Mertavik land.³⁵ However, as U.S. Senator Lisa Murkowski (R-AK) put it, even with Newtok partially relocated, the problem is that “there’s 30 more villages.”³⁶

In 2003, the U.S. Government Accountability Office (GAO) found that 184 of the 213 Alaska Native villages in the state were facing some flooding and erosion.³⁷ In 2009, the GAO issued an update, identifying thirty-one Alaska Native villages, mostly in the western part of the state, facing imminent threats from accelerating permafrost melt.³⁸ The 2003 report discussed possible state and federal solutions to the problem, including expanding the Denali Commission,³⁹ having the Corps and the Natural Resources Conservation Service (NRCS) alter their cost-benefit analyses to include social and environmental factors, waiving the federal cost-share requirement for flooding and erosion projects, and authorizing

32. *Id.*

33. See *Newtok Relocation History*, *supra* note 29 (stating consultants were first hired in 1983); Gentry, *supra* note 17 (“The group . . . who moved . . . on October 15, 2019 did not have running water nor sewer for the new school . . .”).

34. *Newtok Relocation History*, *supra* note 29.

35. Gentry, *supra* note 17.

36. Geof Koss, ‘We Cannot Wait.’ *Sinking Alaska Village Finds New Home*, E&E NEWS (Sept. 4, 2019), <https://www.eenews.net/stories/1061110713>.

37. U.S. GOV’T ACCOUNTABILITY OFF., GAO-04-142, ALASKA NATIVE VILLAGES: MOST ARE AFFECTED BY FLOODING AND EROSION, BUT FEW QUALIFY FOR FEDERAL ASSISTANCE, at 1 (2003), <https://www.gao.gov/assets/gao-04-142.pdf> [hereinafter GAO 2003 REPORT] (agency formerly known as General Accounting Office).

38. U.S. GOV’T ACCOUNTABILITY OFF., GAO-09-551, ALASKA NATIVE VILLAGES: LIMITED PROGRESS HAS BEEN MADE ON RELOCATING VILLAGES THREATENED BY FLOODING AND EROSION, at 1 (2009), <https://www.gao.gov/assets/gao-09-551.pdf> [hereinafter GAO 2009 UPDATE].

39. “Introduced by Congress in 1998, the Denali Commission is an independent federal agency designed to provide critical utilities, infrastructure, and economic support throughout Alaska. With the creation of the Denali Commission, Congress acknowledged the need for increased inter-agency cooperation and focus on Alaska’s remote communities.” *Denali Commission Story*, DENALI COMM’N, <https://www.denali.gov/> (last visited Apr. 1, 2022).

agency fund-bundling.⁴⁰

The 2009 update found that twelve of the thirty-one villages facing the largest threat were considering relocation options, but the update noted that none of the proposed policies to help support and fund the transitions had been implemented.⁴¹ For four villages in particular, including Newtok, the GAO estimated that there were ten to fifteen years left before their locations were “lost to erosion.”⁴² The estimated economic cost for relocation at these four locations was \$80 to \$200 million, which included new evacuation roads, airports, and housing.⁴³ This did not take into account the cultural loss suffered by communities forced to leave places they had inhabited for hundreds or even thousands of years.⁴⁴

Although Newtok acquired funding for its ongoing relocation, its successes, however limited, have not been universal. Other threatened villages seeking assistance from federal and state programs have been unable to attain adequate funding.⁴⁵ This is partially by design. For example, agency programs—like the Corps’s Continuing Authorities Program, the Federal Emergency Management Agency’s (FEMA) Hazard Mitigation Grant Program and Pre-Disaster Mitigation Program, and NRCS’s Emergency Watershed Protection program—each require cost-sharing, meaning that villages must procure millions of dollars from alternative sources to fund their relocation.⁴⁶ All three agency programs likewise require detailed cost-benefit analyses, and the Corps gives priority to those that have the highest benefit-to-cost ratio.⁴⁷

While federal agencies do not currently coordinate on action planning and funding, Alaska designated the Department of Commerce, Community, and Economic Development as the lead state agency for village relocation assistance along with the Immediate Action Workgroup, part of the Governor’s Sub-Cabinet on Climate Change.⁴⁸ The state also developed the Alaska Climate Change Impact Mitigation Program, which awarded grants of up to \$150,000 for relocation planning.⁴⁹ However, the grant program was not re-funded after its first

40. GAO 2003 REPORT, *supra* note 37, at 41–48.

41. GAO 2009 UPDATE, *supra* note 38, at 16, 27–34.

42. *Id.* at 10.

43. *Id.*

44. *See generally id.* (making no mention of cultural cost associated with relocation); GAO 2003 REPORT, *supra* note 37 (also making no mention of cultural cost associated with relocation).

45. GAO 2003 REPORT, *supra* note 37.

46. GAO 2009 UPDATE, *supra* note 38, at 20–27.

47. *Id.*

48. *Id.* at 40.

49. *Id.* at 34.

year.⁵⁰ Instead, risk assessment is now done directly through the Alaska Risk Mapping, Assessment and Planning Program, which connects local governments to FEMA and the state government.⁵¹ These assessments often include discussion of migration and relocation but do not mention how villages and individuals might afford those transitions.⁵²

For villages that cannot afford to participate in cost-sharing with federal agencies, the prospects of funding hundred-million-dollar relocations are bleak. Even in Newtok, where decades of planning and sustained political pressure led to moderate financing success, two-thirds of the village has still not moved and is currently facing sinking telephone poles, cracking boardwalks, the disappearance of their natural sewage removal waterway, and the blossoming of dangerous mold.⁵³

With wildly inadequate administrative solutions, other considerations must be made. Where policy has failed, the doctrine of regulatory takings presents an alternative opportunity for remedy.

III. A REVIEW OF REGULATORY TAKINGS LAW

Regulatory takings law is widely considered to have been borne of Justice Oliver Wendell Holmes's opinion in *Pennsylvania Coal Co. v. Mahon*.⁵⁴ Justice Holmes recognized that the "[g]overnment could hardly go on" if it had to compensate property owners for every exercise of the police power that reduced "to some extent the values incident to property."⁵⁵ Nonetheless, the opinion expressed that there are limits to such police power, concluding that "while property may be regulated to a certain extent, if regulation goes too far it will be recognized as a taking."⁵⁶

While not explicitly under the title of "regulatory takings" established in *Pennsylvania Coal*, U.S. courts have effectively recognized a broader application of regulatory takings doctrine to other, non-regulatory government action detrimental to individual property. In the

50. Telephone Interview with Sally Russell Cox, Alaska Dept. of Com., Cmty., & Econ. Dev., Div. of Cmty. and Reg'l Affs. (Oct. 27, 2021).

51. *Alaska Risk MAP Program*, ALASKA DEPT. OF COM., CMTY., & ECON. DEV., <https://www.commerce.alaska.gov/web/dcra/PlanningLandManagement/RiskMAP.aspx> (last visited Oct. 27, 2021).

52. *See, e.g.*, ALASKA DEPT. OF COM., CMTY., & ECON. DEV., WORKING GROUP ON ADAPTATION, ASSISTING IMMINENTLY-THREATENED ALASKA NATIVE VILLAGES (2018), https://www.commerce.alaska.gov/web/Portals/4/pub/RiskMAP/CALT_Presentation_SRCox.pdf (describing planning for adaptation and mitigation with no mention of cost).

53. Gentry, *supra* note 17.

54. 260 U.S. 393 (1922).

55. *Id.* at 413.

56. *Id.* at 415.

1860s, after a Wisconsin government project to dam the Fox River flooded the surrounding area, farmers whose land was destroyed went to court seeking compensation from the state.⁵⁷ The U.S. Supreme Court found in *Pumpelly v. Green Bay & Mississippi Canal Co.* that a government taking had occurred, stating: “[W]here real estate is actually invaded by superinduced additions of water, earth, sand, or other material, or by having any artificial structure placed on it, so as to effectually destroy or impair its usefulness, it is a taking, within the meaning of the Constitution”⁵⁸

Since *Pennsylvania Coal*, courts have consistently held that government actions that were not explicitly regulatory, but nonetheless caused a significant diminution in the value of a plaintiff’s property, amount to takings. In *United States v. Causby*,⁵⁹ the U.S. military conducted frequent flights out of an airport in Greensboro, North Carolina.⁶⁰ The plaintiffs in the case owned a nearby chicken farm, but the military planes flew so low and were so loud that the farm owners were often unable to sleep.⁶¹ Furthermore, about 150 of their chickens died flying into the walls in fright, and the plaintiffs eventually had to shutter their business.⁶² In his majority opinion finding for the farm owners, Justice Douglas stated “a direct and immediate interference with the enjoyment and use of the land” rendering that land uninhabitable is a constitutional taking.⁶³

Present-day regulatory takings law has provided new context for decisions like *Pumpelly* and *Causby*. U.S. courts typically evaluate regulatory takings questions using the ad hoc balancing test set out in *Penn Central Transportation Co. v. City of New York*.⁶⁴ Commenting on the relationship between regulatory takings and physical invasion, the *Penn Central* Court noted that “[a] ‘taking’ may more readily be found when the interference with property can be characterized as a physical invasion by government . . . than when interference arises from some public program adjusting the benefits and burdens of economic life to promote the common good.”⁶⁵ The case arose when the city of New York enforced an architectural heritage law that blocked plaintiffs from constructing an office building on top of Grand Central Station.⁶⁶ At issue was whether this regulatory action amounted to a taking of the superjacent airspace

57. *Pumpelly v. Green Bay & Miss. Canal Co.*, 80 U.S. 166 (1871).

58. *Id.* at 181.

59. 328 U.S. 256 (1946).

60. *Id.* at 258–59.

61. *Id.* at 259.

62. *Id.*

63. *Id.* at 264, 266.

64. 438 U.S. 104, 124 (1978).

65. *Id.* (citing *Causby*, 328 U.S. at 256).

66. *Id.* at 116–18.

above the train station.⁶⁷ In affirming that no taking had occurred, the Court set up a tripartite test evaluating the (1) overall economic impact; (2) parties' protection from interference of their "distinct" investment-backed expectations; and (3) character of the government action.⁶⁸

In 1992, the U.S. Supreme Court introduced a more stringent standard for regulatory takings in *Lucas v. South Carolina Coastal Council*.⁶⁹ The issue was whether coastal management regulations promulgated by South Carolina, in preventing a property developer from building houses atop his land, were regulatory takings.⁷⁰ Writing for the Court, Justice Scalia stated that "[w]here the State seeks to sustain regulation that deprives land of all economically beneficial use, we think it may resist compensation only if the logically antecedent inquiry into the nature of the owner's estate shows that the proscribed use interests were not part of his title to begin with."⁷¹ Effectively, when government action deprives a property owner of all economic use of her land, this is a categorical, or *per se*, taking.⁷²

Alaska's takings doctrine has grown from these federal roots. The Alaska Constitution states: "[p]rivate property shall not be taken or damaged for public use without just compensation."⁷³ Alaska's courts assert that this "provides greater protection for property owners than

67. *Id.* at 118–19.

68. *Id.* at 124.

69. 505 U.S. 1003 (1992).

70. *Id.* at 1006–07, 1015.

71. *Id.* at 1027.

72. *See id.* at 1015–16. *But see id.* at 1066–67 (Stevens, J., dissenting) (describing how the majority opinion's rationale "do[es] not justify a *per se* rule for total regulatory takings"). In the years since and as a direct result of the *Lucas* decision, environmental protection has become significantly more difficult. *See Nevitt, supra* note 4 ("[F]ederal, state, and local climate adaptation measures must be careful to not run afoul of the Regulatory Takings doctrine."). States and municipalities have struggled to come up with solutions for land protection, and some have said they effectively cannot deny building permits outright, even in coastal areas with high likelihoods of erosion. Amanda Reilly, *How a 1992 High Court Ruling Eroded Regulatory Might*, E&E NEWS (June 30, 2017, 1:15 PM), <https://subscriber.politicopro.com/article/eenews/1060056890>. One exception was the *Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Plan. Agency*, 535 U.S. 302 (2002) decision, where a temporary moratorium on development imposed for the purpose of developing a comprehensive land-use plan was found not to constitute a *per se* taking because it was temporary. *Id.* at 340–41. However, this regulation was for the purpose of environmental assessment, not substantive regulation. *See id.* at 310–11 (discussing the passage of the temporary moratorium for the purposes of evaluating water and air quality, among other environmental considerations). Based on this model, with certain conditions met, Alaska presents a new frontier for regulatory takings jurisprudence, using *Lucas* to combat, rather than uphold, environmental degradation and destruction.

73. ALASKA CONST. art. I, § 18.

does the Fifth Amendment of the United States Constitution.”⁷⁴ While prominent federal cases tend to only refer to physical invasions or the underlying regulations within the character of government action inquiry,⁷⁵ the Alaska Supreme Court has used broader language. In the landmark regulatory takings case *Anchorage v. Sandberg*,⁷⁶ the court used more inclusive language, asserting that “[g]overnment actions become ‘takings’ under principles of inverse condemnation when a private landowner is forced to bear an unreasonable burden as a result of the government’s exercise of power in the public interest.”⁷⁷

Sandberg, decided a year after *Lucas*, involved Alaska’s designation of several parcels of private land as parks, adversely affecting the plaintiff company’s ability to develop on its own land by surrounding it with a new park.⁷⁸ Citing *Lucas*, the court held that there was no taking because per se takings cover a narrow scope.⁷⁹ The court held that plaintiffs can invoke the doctrine solely during “(1) cases of physical invasion and (2) cases where a regulation denies a landowner of all economically feasible use of the property.”⁸⁰

Unable to find a per se taking, the *Sandberg* court applied the three *Penn Central* factors and inserted an additional consideration of “[t]he legitimacy of the interest advanced by the regulation or land-use decision” into its analysis of government action.⁸¹ Alaska courts have

74. *Spinell Homes, Inc. v. Mun. of Anchorage*, 78 P.3d 692, 702 (Alaska 2003) (citing *R & Y, Inc. v. Mun. of Anchorage*, 34 P.3d 289 (Alaska 2001)).

75. *See, e.g., Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104, 124 (1978) (citing *United States v. Causby*, 328 U.S. 256 (1946)) (“A ‘taking’ may more readily be found when the interference with property can be characterized as a physical invasion by government . . . than when interference arises from some public program adjusting the benefits and burdens of economic life to promote the common good.”).

76. 861 P.2d 554 (Alaska 1993).

77. *Id.* at 558 (citing *Agins v. City of Tiburon*, 447 U.S. 255, 260–62 (1980)).

78. *Id.* at 555–56.

79. *Id.* at 557.

80. *See id.* (recognizing per se takings under Alaska law to include the *Lucas* precedent). Since *Sandberg*, the Alaska Supreme Court has offered a slightly more expansive definition of “regulation” for purposes of per se takings to potentially include other government actions, but all have come as a result of some official government act, whether through regulations, injunctions, or some form of administrative adjudication. *See, e.g., Beluga Mining Co. v. State Dep’t of Nat. Res.*, 973 P.2d 570, 575 (Alaska 1999) (describing an injunction as a regulation within the per se takings analysis); *Cannone v. Noey*, 867 P.2d 797, 798–801 (Alaska 1994) (discussing the possibility of a per se taking occurring as a result of an administrative denial of a permit).

81. *Sandberg*, 861 P.2d at 557 (first citing *State v. Arctic Slope Reg’l Corp.*, 834 P.2d 134, 143 (Alaska 1991); and then citing *Agins v. City of Tiburon*, 447 U.S. 255, 260–61 (1980)); *see also Hageland Aviation Servs., Inc. v. Harms*, 210 P.3d 444, 450 n.21 (Alaska 2009) (clarifying the factor as a consideration within the government action analysis).

separately noted that “[t]he finding of a taking . . . depends on whether someone has been deprived of the economic benefits of ownership, not whether the State captures any of those benefits.”⁸² Moreover, the taking or damaging of the property must have “been proximately caused by a government entity.”⁸³

In western and northern Alaska, Alaska Native villages sinking into the ground as a direct result of permafrost melt and erosion have become or will soon become impossible to live in.⁸⁴ Like in *Causby*,⁸⁵ the individual Alaska Native property owners are left unable to enjoy any practical use from their property: businesses cannot function, and people cannot live on liquefying, eroding ground.⁸⁶

While this appears to open the door for a per se takings claim, the state action component currently presents a likely insurmountable impediment. There is no regulation, injunction, or other immediately obvious state action on which to ground a per se takings claim.⁸⁷ This does not mean that no takings claim exists but rather that a state court is likely to require the *Sandberg* ad hoc approach, which considers the legitimacy of state action.⁸⁸

Alaska Native villages threatened by melting permafrost would easily meet the first two *Sandberg* factors derived from *Penn Central*. Under the economic impact element of the test, individual home- and business-owners in Alaska Native villages need only show that their living and working spaces have been severely impacted by the permafrost melt and subsequent erosion.⁸⁹ Given the wealth of documentation as to

82. *Waiste v. State*, 10 P.3d 1141, 1154 (Alaska 2000) (citing *Stewart & Grindle, Inc. v. State*, 524 P.2d 1242, 1248 (Alaska 1974)).

83. *Beeson v. City of Palmer*, 370 P.3d 1084, 1088 (Alaska 2016) (first citing *Fairbanks N. Star Borough v. Lakeview Enters., Inc.*, 897 P.2d 47, 52 (Alaska 1995); and then citing *Bakke v. State*, 744 P.2d 655, 657 (Alaska 1987)); see also discussion *infra* Part IV.

84. See, e.g., GAO 2003 REPORT, *supra* note 37, at 8; GAO 2009 UPDATE, *supra* note 38, at 7.

85. *United States v. Causby*, 328 U.S. 256, 259 (1946).

86. See Alec Luhn, *Slow-Motion Wrecks: How Thawing Permafrost is Destroying Arctic Cities*, GUARDIAN (Oct. 14, 2016), <https://www.theguardian.com/cities/2016/oct/14/thawing-permafrost-destroying-arctic-cities-norilsk-russia> (discussing the effects of permafrost melt on Arctic cities similar to problems faced by villages in Alaska).

87. See *infra* Part VI.

88. *Anchorage v. Sandberg*, 861 P.2d 554, 557 (Alaska 1993) (first citing *State v. Arctic Slope Reg'l Corp.*, 834 P.2d 134, 143 (Alaska 1991); and then citing *Agins v. City of Tiburon*, 447 U.S. 255, 260–61 (1980)).

89. See, e.g., *id.* at 558–59 (quoting *Homeward Bound, Inc. v. Anchorage Sch. Dist.*, 791 P.2d 610, 614 (Alaska 1990)) (noting that “[p]rivate property is taken or damaged for constitutional purposes if the government deprives the owner of the economic advantages of ownership” but also that “economic infeasibility” of

the destruction being wrought, those economic impacts are undoubtedly both significant and severe.⁹⁰ Regarding their distinct investment-backed interests, many of these villages have existed for decades, and some families have lived in the area for thousands of years.⁹¹ By settling there centuries ago, building houses, and investing in their communities, Alaska Native residents created an obviously reasonable and investment-backed expectation that they would continue to be able to live on the land.⁹²

Despite the strength of these two factors, finding a regulatory taking requires finding that government action has actually occurred.⁹³ Additionally, while Alaska's constitution broadens takings to include government-caused damage, *Sandberg* nonetheless requires a review of the legitimacy of the government interest in the taking.⁹⁴ Broadly speaking, more legitimate government interests make courts less likely to find that the government's actions constitute a taking.⁹⁵

While the destruction itself is obvious, tying that destruction to actions by the Alaska government presents the biggest hurdle for any takings claim against the state.

IV. ALASKA'S INVESTMENT IN OIL AS STATE ACTION

A potential plaintiff could argue that the Alaska state government, through its continued actions participating in and promoting the oil and gas industry, has both directly and indirectly caused the destruction of the land on which Alaska Native villages sit.

development could also constitute a taking).

90. See, e.g., Luhn, *supra* note 86; Brian Kahn, *Permafrost Melt Could Destroy a Third of All Arctic Infrastructure, Affecting as Many as 4 Million People*, GIZMODO (Dec. 11, 2018, 11:11 AM), <https://gizmodo.com/permafrost-melt-could-destroy-a-third-of-all-arctic-inf-1831011572>.

91. See, e.g., *The Village - Newtok*, *supra* note 26 (describing thousands of years of seasonal reliance on the land for the Qaluyaarmiut of Newtok and documentation of the village itself beginning as early as 1949).

92. See *Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104, 136 (1978) (discussing present and decades-long historic use of a property as an example of what qualifies as a reasonable investment-backed expectation).

93. See *id.* at 128 (discussing the character of government action as one of the elements of a regulatory takings claim); *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1029 (1992) (recognizing regulation as an obvious form of government action).

94. *Sandberg*, 861 P.2d at 557-58; *R & Y, Inc. v. Mun. of Anchorage*, 34 P.3d 289, 293 (Alaska 2001) (first citing *Sandberg*, 861 P.2d at 557; then citing *Beluga Mining Co. v. State*, 973 P.2d 570, 575 (Alaska 1999); and then citing *Cannone v. Noey*, 867 P.2d 797, 800 (Alaska 1994)).

95. See *R & Y, Inc.*, 34 P.3d at 290 ("[T]he legitimacy of the [Municipality of Anchorage]'s interest in restricting development in wetlands outweighs the relatively minor impact its action had on the value of the land.").

Alaska's history of drilling for oil goes back more than a century.⁹⁶ Because of the state's remote location, its oil extraction industry developed slowly, but by the time Alaska acquired statehood in 1959, Texaco, Mobil, Chevron, Shell, Marathon, and many other major U.S. oil companies were investing in areas like the Swanson River oil field on the Kenai Peninsula.⁹⁷ However, in 1968, discovery of the Prudhoe Bay oil field on Alaska's North Slope, between the Alaska National Petroleum Reserve and what would later become the Arctic National Wildlife Refuge, made Alaska a top American oil destination.⁹⁸ At the time of this discovery, it was estimated that ten billion barrels of crude oil lay under the surface of Prudhoe Bay, the biggest oil reserve ever found under American soil to that point.⁹⁹ By the late 1970s, Alaska was the second largest state producer of oil in the country, behind only Texas.¹⁰⁰

The burgeoning interest in Alaska's oil potential prompted the state government to act. In 1969, new Prudhoe Bay oil leases alone brought in \$900 million for the state.¹⁰¹ These leases fundamentally altered Alaska's economic and political landscape: the 1970 state budget was expanded by seventy-seven percent from the previous year,¹⁰² and a debate immediately began about where to put the rest of the money.¹⁰³ While most of the funds were initially invested in U.S. Treasury notes and bonds,¹⁰⁴ Alaska quickly spent the lease sale revenue on capital projects and state programs.¹⁰⁵

Seeking a more long-term investment plan, the state government proposed a constitutional amendment creating a permanent fund

96. *Oil Discovery and Development in Alaska*, ALASKA HUMANS. F., <http://www.akhistorycourse.org/modern-alaska/oil-discovery-and-development-in-alaska/> (last visited Feb. 20, 2022).

97. *Id.*

98. See *Alaska Pipeline Chronology*, PBS, <https://www.pbs.org/wgbh/americanexperience/features/pipeline-alaska-pipeline-chronology/> (last visited Feb. 20, 2022).

99. Oliver S. Goldsmith, *Tracing the Growth of Alaska State Spending Since 1979*, at 4 (Univ. of Alaska Anchorage Inst. of Soc. & Econ. Rsch., Fiscal Pol'y Working Paper No. 2, 1991).

100. U.S. ENERGY INFO. ADMIN., U.S. CRUDE OIL PRODUCTION IN SELECTED STATES AND AREAS (JANUARY 1970–AUGUST 2018) (2018), <https://www.flickr.com/photos/eiagov/31791566138/>.

101. *Historical Timeline of the Fund and APFC*, ALASKA PERMANENT FUND CORP., <https://apfc.org/who-we-are/history-of-the-alaska-permanent-fund/timeline/> (last visited Feb. 20, 2022) [hereinafter *Fund Timeline*].

102. Wallace Turner, *Oil Windfall Aids Alaska Revenue*, N.Y. TIMES, July 11, 1971, at 21.

103. *Alaska Permanent Fund – Governance*, ALASKA PERMANENT FUND CORP. 2 (2018), http://www.akleg.gov/basis/get_documents.asp?session=30&docid=53843.

104. Turner, *supra* note 102, at 21.

105. *Fund Timeline*, *supra* note 101.

designed to hold and invest revenue generated from the state's oil resources.¹⁰⁶ In November 1976, Alaska citizens overwhelmingly approved the amendment, officially creating the Alaska Permanent Fund.¹⁰⁷ Four years later, the legislature created the Alaska Permanent Fund Corporation (APFC) to operate the fund.¹⁰⁸ Alaska gave the APFC fiduciary responsibilities for fund management and passed it into law along with an exhaustive list of the financial securities in which the fund could invest.¹⁰⁹

In 1982, the Alaska legislature permitted the APFC to begin disbursing dividends, providing each Alaskan \$1,000 in the program's first year.¹¹⁰ In 1983, the exhaustive list of permitted investments was altered to allow the APFC to invest in the stock market.¹¹¹ By 1989, the Alaska Permanent Fund was valued at \$10 billion.¹¹² By 2018, it crossed \$60 billion, and in 2020, the Alaska Permanent Fund became the largest source of unrestricted general fund revenue in the state budget.¹¹³

A. The Legitimate State Interest

Sandberg analysis requires considering the legitimacy of the state interest.¹¹⁴ Generally, the more legitimate the state interest, the more likely a court is to find that a regulatory taking did not occur.¹¹⁵ However, this legitimacy interest is weighed against the actual effect on the property, meaning that even the most legitimate state interest cannot overcome a finding that the property was wholly destroyed.¹¹⁶ Additionally, the legitimate state interest question is not a dispositive factor but instead falls under the scope of consideration of the nature of

106. ALASKA DEP'T OF REVENUE, THE ALASKA PERMANENT FUND AND THE PERMANENT FUND PROTECTION ACT (2017), http://www.akleg.gov/basis/get_documents.asp?session=30&docid=661.

107. *Fund Timeline*, *supra* note 101.

108. *Id.*

109. *Id.*

110. *Id.*

111. *Id.*

112. *Id.*

113. *Id.*

114. See *Anchorage v. Sandberg*, 861 P.2d 554, 557 (Alaska 1993) (contrasting *Lucas's* per se takings evaluation to an ad hoc analysis that involves an inquiry into legitimate government interests).

115. See *R & Y, Inc. v. Mun. of Anchorage*, 34 P.3d 289, 290 (Alaska 2001) (“[T]he legitimacy of the MOA’s interest in restricting development in wetlands outweighs the relatively minor impact its action had on the value of the land.”).

116. See *id.* at 299 (validating the plaintiff’s assertion that a court would err in finding that if the government “interest . . . is legitimate, no taking could be found” by expressly recognizing that an adequate weighing of factors had occurred).

the government action.¹¹⁷ The U.S. Supreme Court has interpreted legitimate government interest generously, giving credence to a “broad range of governmental purposes and regulations.”¹¹⁸ Alaska courts have followed suit, broadly interpreting what constitutes a legitimate state interest.¹¹⁹

For a potential plaintiff, the legitimacy of Alaska’s investment in oil would be difficult to contest. The state statutory code explicitly proclaims that “the people of Alaska have an interest in the development of the state’s oil and gas resources.”¹²⁰ The code then provides reasons for the legitimacy of oil development, noting that “it is in the best interests of the state . . . to encourage an assessment of its oil and gas resources.”¹²¹ Beyond the statutory language, given the court’s willingness to broadly interpret legitimate interests, the fact that the state’s budget relies so heavily on the Alaska Permanent Fund, and thus the oil extraction industry, likely would independently establish such an interest.¹²²

While appearing to present a barrier, the legitimate government interest must still be weighed against the other factors, along with the actual resulting harm.¹²³ Because the Alaska Native villages are becoming uninhabitable, so long as state action can be tied to the damage, the legitimacy of the government interest is unlikely to destroy an inverse condemnation takings claim.¹²⁴

117. *Hageland Aviation Servs., Inc. v. Harms*, 210 P.3d 444, 449–50 (Alaska 2009).

118. *Nollan v. Cal. Coastal Comm’n*, 483 U.S. 825, 835 (1987).

119. *See, e.g., Holding v. Mun. of Anchorage*, 63 P.3d 248, 251 (Alaska 2003) (finding that the government had a legitimate interest in regulating adult-oriented businesses).

120. ALASKA STAT. § 38.05.180(a)(1) (2021).

121. *Id.* § (a)(2).

122. *Fund Timeline*, *supra* note 101.

123. *See, e.g., Waiste v. State*, 10 P.3d 1141, 1150 n.44 (Alaska 2000) (discussing how in *United States v. James Daniel Good Real Prop.*, 510 U.S. 43, 57–59 (1993), government action in furtherance of a legitimate interest was done in a way that resulted in a taking); *Vanek v. State*, 193 P.3d 283, 293 n.64 (Alaska 2008) (citing *Lingle v. Chevron U.S.A. Inc.*, 544 U.S. 528, 540–43 (2005) saying the “formula inquiring whether government regulation ‘substantially advances’ a legitimate state interest is a due process inquiry and not an appropriate test for determining whether a taking has occurred”); *R & Y, Inc. v. Mun. of Anchorage*, 34 P.3d 289, 290 (Alaska 2001) (“[T]he legitimacy of the MOA’s interest in restricting development in wetlands outweighs the relatively minor impact its action had on the value of the land.”).

124. This legal claim does not threaten Alaska’s dividend nor its legitimacy, it merely notes the connection between Alaska’s dividend and its private oil extraction industry to advocate for compensation resulting from the destruction of Alaska Native property.

B. The Case for a State Government Action

A potential plaintiff introducing an inverse condemnation claim could present Alaska's leasing of state land for oil and gas drilling as a state government action. While government action in regulatory takings typically derives from a specific regulation, no such regulation is necessary to succeed under a *Sandberg* analysis, especially when the result is not a physical taking of land but the destruction of it.¹²⁵ In an inverse condemnation lawsuit against Alaska, potential plaintiffs could present their cases by either (1) claiming that the state oil leases themselves constitute direct, legitimate government actions, thereby coupling the state with the burning of fossil fuels, or (2) claiming that the state government's actions were both direct and indirect: not only did the leasing of oil yoke the state to the industry, the state also supported the oil extraction industry's growth and development for the primary purpose of extracting oil to be burned.

Both approaches require concluding that oil extraction was mainly for the purposes of burning. When the oil extraction industry in Alaska was finding its footing in the 1970s,¹²⁶ the vast majority of crude oil was refined for the purposes of transportation and industry.¹²⁷ At the time, in the United States, a significant amount of petroleum was burned for use in electricity generation.¹²⁸ Most of the oil used in transportation, electricity generation, and industry is derived from gasoline, distillate fuel oil, and jet fuel.¹²⁹ The same was still true in 2017, when the average

125. See *Anchorage v. Sandberg*, 861 P.2d 554, 558 (Alaska 1993), *overruled on other grounds by* *Lingle v. Chevron U.S.A. Inc.*, 544 U.S. 528, 540–42 (2005) (“Government actions become ‘takings’ under principles of inverse condemnation when a private land owner is forced to bear an unreasonable burden as a result of the government’s exercise of power in the public interest.”).

126. See *Alaska Pipeline Chronology*, *supra* note 98 (describing the start to Alaska’s oil development mainly following the discovery of the Prudhoe Bay oil reserve in the late 1960s and the construction of the pipeline in the 1970s).

127. See *Oil Total Final Consumption by Sector, 1971–2018*, INT’L ENERGY AGENCY (Sept. 4, 2020), <https://www.iea.org/data-and-statistics/charts/oil-total-final-consumption-by-sector-1971-2018> (reporting that most of the use of oil in the 1970s was taken up by a combination of “Road,” “Aviation,” “Rail,” “Navigation,” and “Industry”).

128. See MICHAEL RATNER & CAROL GLOVER, CONG. RSCH. SERV., R40187, U.S. ENERGY: OVERVIEW AND KEY STATISTICS 7–8 (2014) (stating that, in 1970, residential and commercial energy accounted for fifteen percent of petroleum use). Those numbers have since decreased. See *id.* (stating that the percentage of residential and commercial energy generated from petroleum decreased to five percent by 2005).

129. U.S. ENERGY INFO. ADMIN., OIL AND PETROLEUM PRODUCTS EXPLAINED: USE OF OIL (May 10, 2021), <https://www.eia.gov/energyexplained/oil-and-petroleum-products/use-of-oil.php>. Distillate fuel oil is used to make diesel fuel. *Id.*

barrel of crude oil “would break down to about twenty gallons of gasoline, two gallons of hydrocarbon gas liquids, one gallon of heavy fuel oil, four gallons of jet fuel, eleven gallons of ultra-low sulfur distillate, six gallons of other products, and less than one gallon of other distillates (heating oil).”¹³⁰ These oil products—when used to generate energy in vehicles, manufacturing plants, and homes—are all burned.¹³¹

1. Approaching Government Action Directly

The direct approach is relatively simple: Alaska maintains leases with dozens of oil companies for continued extraction.¹³² In total, Alaska currently leases more than two million land acres and more than 960,000 offshore acres of state property.¹³³ According to state government records, Alaska has signed more than 12,500 oil and gas leases for extraction purposes since 1959.¹³⁴ Those leases generally grant the lessees a real property interest in the leased area.¹³⁵ This transfer of property interest constitutes a tangible, direct action that the Alaska government has taken extensively and consistently since it was first formed.¹³⁶ Alaska sold these leases for the primary purpose of drilling for oil (and natural gas)—fossil fuels that directly contribute to the increase of global temperatures and the melting of the permafrost.¹³⁷

130. Isaac S. Simonelli, *Where Does All That Oil Go?*, ALASKA BUS., Oct. 2, 2018, at 8, <https://www.akbizmag.com/industry/oil-gas/where-does-all-that-oil-go/>.

131. See *Petroleum*, NAT’L GEOGRAPHIC RES. LIBR., <https://www.nationalgeographic.org/encyclopedia/petroleum/> (last visited Oct. 31, 2021) (describing how products like gasoline are burned to produce energy). Separate arguments can also be made that the extraction, transportation, and processing of the oil constitute significant additional contributions to the melting of the permafrost, but in the interest of clarity and concision, this Note only discusses burning.

132. See generally, ALASKA DIV. OF OIL & GAS, ACREAGE BY LESSEE – SUMMARY (2021) (Jan. 4, 2022), at 1-3, https://dog.dnr.alaska.gov/Documents/Leasing/PeriodicReports/Lease_AcreageByLesseeSummary.pdf (listing the fifty-five people and entities Alaska currently leases land to for purposes of oil extraction).

133. *Id.*

134. See ALASKA DIV. OF OIL & GAS, LEASE STATUS (2021) (Jan. 4, 2022), https://dog.dnr.alaska.gov/Documents/Leasing/PeriodicReports/Lease_LeaseStatus.pdf [hereinafter ALASKA LEASE STATUS] (listing 12,514 records of “Oil & Gas Comp” leases, the earliest Dec. 10, 1959 and the latest June 9, 2021).

135. Frederick J. Odsen, *Complex Oil Laws Significant to Individual Investors*, ALASKA J. COM. (Mar. 9, 2003, 8:00 PM), <https://www.alaskajournal.com/community/2003-03-10/complex-oil-gas-laws-significant-individual-investors>.

136. ALASKA LEASE STATUS, *supra* note 134.

137. See *infra* Part V.

2. *Approaching Government Action as a Direct/Indirect Hybrid*

The hybrid approach also requires evaluating these leases, but only as one component, albeit a central one, of Alaska's total government action. Through this lens, the leases are part of a broader transaction in which the State of Alaska has promoted the construction of major private oil infrastructure and permanently coupled the state's revenue stream with its oil extraction and transportation industries. Alaska's leases on the North Slope from 1964 to the early 1970s proved to be extremely lucrative following the discovery of the Prudhoe Bay oil reserve.¹³⁸ Northern Alaska was so remote it was difficult to move the product once it had been drilled, but the Prudhoe Bay investments were evidently not for the purposes of keeping the oil solely within state borders.¹³⁹ In 1970, Alaska had an estimated three hundred thousand residents,¹⁴⁰ and based on the average pace of oil consumption in the U.S., it would have taken well over one thousand years for Alaska alone to use the estimated ten billion barrels of oil in the Prudhoe Bay reserve.¹⁴¹ It was therefore inevitable that those drilling oil in Alaska intended for it to be transported out of the state.¹⁴²

After years of planning, the region's largest oil leaseholders formed the Alyeska Pipeline Service Company to prepare for the construction of

138. ALASKA J. COM., AN ALASKA OIL PATCH TIMELINE (2007), <https://www.alaskajournal.com/community/2007-06-24/alaska-oil-patch-timeline>.

139. See Henry Myers, *Federal Decisionmaking and the Trans-Alaska Pipeline*, 4 *ECOLOGY L. Q.*, 915, 915 (1975) (discussing the immediate need for long-range transport solutions of North Slope-drilled oil).

140. U.S. CENSUS BUREAU, HISTORICAL POPULATION CHANGE DATA (1910–2020) (Apr. 26, 2021), <https://www.census.gov/data/tables/time-series/dec/popchange-data-text.html>.

141. See *Alaska Pipeline Chronology*, *supra* note 98. Assuming the per capita average oil consumption for the country, each Alaska resident used somewhere around 23.6 barrels of oil that year and the state used an estimated 7,080,000 barrels. In 1970, the U.S. per capita oil consumption was estimated at 40,174 kWh. *Statistical Review of World Energy – All Data, 1965–2020*, BRIT. PETROLEUM, <https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/xlsx/energy-economics/statistical-review/bp-stats-review-2021-all-data.xlsx> (last visited Oct. 31, 2021). Each barrel of oil is equivalent to about 1,700 kWh of energy. Adam Hayes, *Barrel of Oil Equivalent (BOE)*, INVESTOPEDIA (May 20, 2021), <https://www.investopedia.com/terms/b/barrelofoilequivalent.asp>. In 1970, each Alaska resident therefore used about 23.6 barrels of oil. This very rough calculation—which does not account for potential discrepancies in Alaska's per capita oil consumption compared to that of other states—results in an estimate of 1,412 years.

142. See *Alaska Pipeline Chronology*, *supra* note 98 (describing the almost-immediate planning by Atlantic Richfield, Humble Oil, and British Petroleum Oil to develop a Trans-Alaska Pipeline System to ease the transport of oil out of the state).

a pipeline north to south across the state from Prudhoe Bay to Valdez.¹⁴³ While the project itself was privately funded and mostly concerned U.S. government permitting,¹⁴⁴ the State of Alaska participated with right-of-way and special land permits.¹⁴⁵ Alaska was also aligned with pro-pipeline interests in pipeline-related lawsuits prior to its construction.¹⁴⁶ Once the pipeline was completed in 1977,¹⁴⁷ its oil output increased every year until 1988, reaching a maximum of more than two million barrels per day.¹⁴⁸

Even if the Alaska government did not construct or fund the pipeline directly, its leases in the North Slope and continued presence in the process of pipeline construction demonstrate indirect involvement in the eventual dissemination of Alaska's oil across the country¹⁴⁹ and, eventually, the world.¹⁵⁰

Moreover, by marrying its interests to those of the oil extraction industry through the Alaska Permanent Fund, a potential plaintiff could argue that the state has taken indirect actions that have led to the destruction of Alaska Native villages. The plaintiff could argue that Alaska's intentional actions have made it so that the state cannot decouple itself from its oil, offering companies and investors assurance that it will continue to prop up the industry indefinitely. The invested money from leases now constitutes the largest contributor to Alaska's yearly budget,

143. *Id.* As early as 1970, there was major concern regarding the potential for such a pipeline to itself melt Alaska's permafrost. ARTHUR H. LACHENBRUCH, U.S. DEP'T. OF THE INTERIOR, GEOLOGICAL SURV., SOME ESTIMATES OF THE THERMAL EFFECTS OF A HEATED PIPELINE IN PERMAFROST (1970). These concerns do not remotely compare with the effect on permafrost the product within the pipeline has had and will continue to have. See discussion *infra* Part V.

144. *Alaska Pipeline Chronology*, *supra* note 98.

145. *Wilderness Soc'y. v. Morton*, 479 F.2d 842, 848 (D.C. Cir. 1973).

146. *Id.*

147. *Alaska Pipeline Chronology*, *supra* note 98.

148. *TAPS Throughput Barrels per Day*, ALASKA DEP'T. OF NAT. RES. DIV. OF OIL & GAS, <https://dog.dnr.alaska.gov/information/data> (scroll down to "Alaska's Oil / Gas Production" and click it; then scroll down to the second chart labelled "TAPS Throughput Barrels per Day") (last visited Nov. 1, 2021).

149. See U.S. ENERGY INFO. ADMIN., ALASKA PROFILE ANALYSIS (Jan. 21, 2021), <https://www.eia.gov/state/analysis.php?sid=AK> (noting that most of Alaska's crude oil gets shipped to Washington or California for refining).

150. See, e.g., Robert Tuttle, *Alaska Oil Exports Soar as China Picks Up Slack from West Coast*, BLOOMBERG (Dec. 3, 2020, 6:00 AM), <https://www.bloomberg.com/news/articles/2020-12-03/alaska-oil-exports-soar-as-china-picks-up-slack-from-west-coast> (Alaska starting exports to China); Michael Muskal, *Alaska Oil, Exported for First Time in a Decade, Heads to South Korea*, L.A. TIMES (Sept. 30, 2014, 1:03 PM), <https://www.latimes.com/nation/nationnow/la-na-alaska-oil-export-south-korea-20140930-story.html> (Alaska starting exports to South Korea).

demonstrating the state's complete reliance on the extraction of oil.¹⁵¹ The creation of the Alaska Permanent Fund tied Alaska to the fate of the fossil fuels being removed from under its soil.¹⁵² Even in its name, the state declared that the Alaska Permanent Fund would be perpetual.

Coupled with the arguments about Alaska's initial support of extraction, a potential plaintiff could craft a narrative that the state entered the oil business through its leases, supported the business's growth by encouraging the construction of a pipeline, and then anchored itself to the oil extraction industry through the Alaska Permanent Fund. Even if the oil companies themselves were shipping, refining, and selling oil and their customers were then burning it, Alaska's role in the process was significant and could therefore be considered government action for purposes of a *Sandberg* takings inquiry.

V. TYING GOVERNMENT ACTIONS TO MELTING PERMAFROST

Potential inverse condemnation takings claims under *Sandberg* would need to connect Alaska's actions to the actual harmful results. This can be a difficult task, even in cases where there are plainly written, easily connectable regulations. Drawing links between slightly less-tangible government actions and their results will prove challenging.¹⁵³ To be successful, a potential plaintiff must first connect climate change to permafrost melt, then explain the anthropogenic (human-created) cause of that climate change, and finally argue that Alaska's direct or hybrid actions are substantial contributors to that anthropogenic climate change.

A. Climate Change is Causing Alaska's Permafrost to Melt

Alaska is facing major climate change as a result of human activity. Global warming in particular has been the biggest culprit: winters from 2014 to 2018 in much of the state were more than 5 °F warmer than the state average from 1981 to 2014.¹⁵⁴ In Western Alaska, the average year-

151. See *Fund Timeline*, *supra* note 101 ("2020 | The Fund is a significant contribution within the State's overall fiscal summary and becomes Alaska's #1 source of unrestricted general fund revenues for the State's budget given the decline in oil prices.").

152. *Id.*

153. See *infra* Part VII.

154. Rick Thoman & John E. Walsh, *Alaska's Changing Environment: Documenting Alaska's Physical and Biological Changes Through Observations*, INT'L ARCTIC RSCH. CTR., UNIV. OF ALASKA FAIRBANKS 5 (2019). In December 2021, Kodiak measured temperatures as high as 67 °F, more than 20 °F hotter than any previous December record. Matthew Cappucci & Emily Schwing, *Alaska Hits 67 Degrees, Setting New December Record*, WASH. POST, (Dec. 28, 2021, 4:17 PM), <https://www.washingtonpost.com/weather/2021/12/28/alaska-record->

round temperature from 1969 to 2018 increased 4.3 °F.¹⁵⁵ Alaska's permafrost is following the same pattern of warming: since the 1980s, the average temperatures of the state's permafrost have risen in every measured location,¹⁵⁶ and in some by as much as 4 °F.¹⁵⁷ High below-ground temperatures have resulted in more seasonal thaw depth, reaching as much as thirty-three inches in some places in 2018.¹⁵⁸ By comparison, less than a decade earlier that melt averaged twenty to twenty-four inches.¹⁵⁹

Although the present state of permafrost melt is serious, future global temperature warming presents an even dimmer picture. If global air temperatures rise 5.4 °F, estimates suggest thirty-five to eighty percent of all arctic top permafrost layers could be lost.¹⁶⁰ In the coming decades, this is especially alarming. Alaska's air temperatures are expected to rise between 3.5 °F and 7 °F by 2050.¹⁶¹ If emissions are not substantially reduced, Alaska could become 13 °F warmer by the end of the century.¹⁶² Even the most optimistic projections, which account for a dramatic reduction in emissions, expect at least 5 °F of warming by 2100.¹⁶³

However, global warming is not the only cause of permafrost melt; another effect of climate change, increased rainfall, is also a major contributor.¹⁶⁴ Summer rainfall has not been consistent in recent years in Alaska: while 2014 and 2016 were some of the wettest summers recorded,

temperatures-climate/.

155. Thoman & Walsh, *supra* note 154, at 5.

156. Vladimir E. Romanovsky et al., *Arctic Report Card: Update for 2017: Terrestrial Permafrost*, NAT'L OCEANIC & ATMOSPHERIC ADMIN. (Nov. 28, 2017), <https://www.arctic.noaa.gov/Report-Card/Report-Card-2017/ArtMID/7798/ArticleID/694/Terrestrial-Permafrost>.

157. Michaeleen Doucleff, *Is There a Ticking Time Bomb Under the Arctic?*, NAT'L PUB. RADIO (Jan. 24, 2018, 4:37 AM), <https://www.npr.org/sections/goatsandsoda/2018/01/24/575220206/is-there-a-ticking-time-bomb-under-the-arctic>.

158. Thoman & Walsh, *supra* note 154, at 11.

159. *Id.*

160. See Alina Bykova, *Permafrost Thaw in a Warming World: The Arctic Institute's Permafrost Series Fall-Winter 2020*, THE ARCTIC INST. (Oct. 1, 2020), <https://www.thearcticinstitute.org/permafrost-thaw-warming-world-arctic-institute-permafrost-series-fall-winter-2020/> (mentioning a three-degree Celsius increase—equivalent to a 5.4 °F increase—resulting in a thirty to eighty-five percent loss of top permafrost layers).

161. GLOBAL CLIMATE CHANGE IMPACTS IN THE UNITED STATES 139 (Thomas R. Karl et al. eds., 2009).

162. *Id.*

163. *Id.*

164. Thomas A. Douglas et al., *Increased Rainfall Stimulates Permafrost Thaw Across a Variety of Interior Alaskan Boreal Ecosystems*, 3 NATURE PARTNER JS. CLIMATE & ATMOSPHERIC SCI., no. 28, 1, 1 (2020), <https://www.nature.com/articles/s41612-020-0130-4>.

2013, 2015, and 2017 were between average and dry.¹⁶⁵ However, permafrost thaw increased during wet summers, especially during major precipitation events.¹⁶⁶ After those high-precipitation summers—most notably 2014, the wettest year ever recorded in Alaska—the permafrost did not recover to its pre-wet summer levels, even in subsequent drier years.¹⁶⁷

Even more alarmingly, permafrost melt has created a feedback loop that may be too late to reverse. Global permafrost is estimated to hold about twice the amount of carbon currently in the atmosphere, mostly in the form of tens of thousands of years of undecomposed organic matter.¹⁶⁸ As permafrost melts, this organic matter becomes exposed to decomposition, which then releases carbon into the atmosphere.¹⁶⁹ The release of carbon warms the atmosphere further, causing greater permafrost melt, which releases even more carbon.¹⁷⁰ Not only has this process already begun, but some predict that the “point of no return” has already been reached: permafrost will continue to melt even if all human-related carbon release ceases immediately.¹⁷¹ This does not hinder an argument reliant on the connection being drawn between people and climate change because the massive carbon reserves held by permafrost have yet to be released, and any damage they may cause in the future has yet to be realized.¹⁷²

B. Anthropogenic Actions as the Cause of Climate Change

One clear consensus has been reached within the scientific community: climate change is caused primarily by human activity.¹⁷³

165. *Id.* at 2.

166. *Id.*

167. *Id.* at 3–4.

168. Susan M. Natali et al., *Permafrost Carbon Feedbacks Threaten Global Climate Goals*, 118 PNAS, no. 21, 1, 1 (2021),

<https://www.pnas.org/content/pnas/118/21/e2100163118.full.pdf>.

169. *Id.*

170. *Id.*

171. Jorgen Randers & Ulrich Goluke, *An Earth System Model Shows Self-Sustained Thawing of Permafrost Even If All Man-Made GHG Emissions Stop in 2020*, 10 SCI. REPS., no. 18456, 1, 8 (2020), <https://www.nature.com/articles/s41598-020-75481-z>.

172. *See id.* at 7–8 (discussing how permafrost-captured carbon being released is something that can be addressed now, but its effects will be felt in the “centuries ahead”).

173. *See Scientific Consensus: Earth’s Climate Is Warming*, NAT’L AERONAUTICS & SPACE ADMIN. GLOBAL CLIMATE CHANGE, <https://climate.nasa.gov/scientific-consensus/> (last visited Nov. 1, 2021) (citing reports from major U.S. scientific societies, science academies, U.S. government agencies, and the Intergovernmental Panel on Climate Change all recognizing that humans are the

Both federal¹⁷⁴ and Alaska¹⁷⁵ courts recognize this fact. There is no further inquiry needed into the merits of an argument that climate change is anthropogenic.

C. Alaska's Government Action as a Tangible Contributor to Anthropogenic Climate Change

For potential inverse condemnation takings claims, the causal chain must then conclude with the proposition that Alaska's actions have contributed to the climate change causing the permafrost melt. Under both the direct and hybrid approaches, the government action involved relates to the extraction of oil. Although the hybrid approach also introduces harder-to-quantify factors like long-term reliance interests and state support of private investment, these factors nonetheless are wholly reliant on the burning of Alaska's oil being the cause of Alaska's permafrost melt.

Between 1988 and 2020, extraction from land leased by the State of Alaska produced over 12.7 billion barrels of oil.¹⁷⁶ Additionally, between 1973 and 1988, the state extracted an estimated 6.5 billion barrels.¹⁷⁷ In total, since the early 1970s, state leases have produced roughly 19.2 billion barrels of oil. No available data exist that indicate what percentage of that oil has gone into production for gasoline, diesel fuel, jet fuel, or other purposes.¹⁷⁸ However, most of it is being and has been burned for transportation purposes, much like national averages.¹⁷⁹

primary cause of climate change).

174. See, e.g., *Massachusetts v. EPA*, 549 U.S. 497, 523 (2007) (noting that the "EPA does not dispute the existence of a causal connection between manmade greenhouse gas emissions and global warming"); *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1214 (9th Cir. 2008) (noting that the "NHTSA does not dispute that . . . 'fuel economy improvements could have a significant impact on the rate of CO2 accumulation in the atmosphere,' which would affect climate change").

175. See *Kanuk v. State, Dep't of Nat. Res.*, 335 P.3d 1088, 1097 (Alaska 2014) ("[T]he science of anthropogenic climate change is compelling . . .").

176. See *Annual Gross Oil Production from State Lands*, ALASKA DEP'T OF NAT. RES. DIV. OF OIL & GAS, <https://dog.dnr.alaska.gov/information/data> (scroll down to "Alaska's Oil / Gas Production" and click it; it is the first chart labelled "Annual Gross Oil Production from State Lands") (last visited Jan. 17, 2022) (adding together annual output from 1988 to 2020).

177. See U.S. ENERGY INFO. ADMIN., *ALASKA FIELD PRODUCTION OF CRUDE OIL* (2021), <https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=p&s=mcrfpak2&f=a> (estimating individual year averages by multiplying day-averages by 365 and adding together all years from 1973 to 1987).

178. See Simonelli, *supra* note 130 (discussing only the national average oil barrel breakdown estimated by the U.S. Energy Information Administration).

179. See *id.* ("About 90 percent of the about 236,000 barrels of crude oil the

Several greenhouse gases are released when oil products are burned, including small amounts of methane (CH₄) and nitrous oxide (N₂O), but carbon dioxide (CO₂) is by far the largest gas byproduct by quantity.¹⁸⁰ While a potential lawsuit might include other greenhouse gases, this Note will focus only on the release of CO₂ because of its sheer prevalence in the atmosphere. Relying on national averages, each barrel of oil produces roughly 0.43 metric tons of CO₂ when burned.¹⁸¹ Since 1973, that means Alaska's government has contributed to the release of an estimated 8.3 billion metric tons of CO₂, with 5.5 billion released since 1988.

Atmospheric CO₂ is typically measured in parts per million (ppm) by volume.¹⁸² One ppm of atmospheric CO₂ is the equivalent of 2.13 gigatons (2,130,000,000 metric tons) of released carbon.¹⁸³ One metric ton of carbon converts to 3.664 metric tons of CO₂.¹⁸⁴ This means that every 7.8 billion tons of CO₂ released into the atmosphere adds roughly an additional part per million. Alaska's output has crossed this threshold, adding an estimated 1.064 parts per million of CO₂ to the atmosphere.

Pre-industrialization, the atmosphere averaged 280 ppm of CO₂.¹⁸⁵ When the U.S. granted Alaska statehood in January 1959, CO₂ concentration was measured at 315.58 ppm.¹⁸⁶ By January 1973 it was at 328.55 ppm.¹⁸⁷ By January 2022, atmospheric CO₂ rose to about 418.19 ppm.¹⁸⁸ Alaska's 1.064 ppm oil-burning contribution therefore accounts

Cherry Point facility processes each day ends up as transportation fuel.”).

180. *Sources of Greenhouse Gas Emissions*, ENV'T PROT. AGENCY, <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions#transportation> (last updated July 27, 2021).

181. *Greenhouse Gases Equivalencies Calculator – Calculations and References*, ENV'T PROT. AGENCY, <https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references> (last updated Apr. 28, 2021).

182. See, e.g., Rebecca Lindsey, *Climate Change: Atmospheric Carbon Dioxide*, NAT'L OCEANIC & ATMOSPHERIC ADMIN., CLIMATE.GOV (Oct. 7, 2021), <https://www.climate.gov/news-features/understanding-climate/climate-change-atmospheric-carbon-dioxide> (describing atmospheric carbon dioxide analysis using parts per million).

183. *Conversion Tables*, CARBON DIOXIDE INFO. ANALYSIS CTR. (1990) (modified from CARBON DIOXIDE REVIEW: 1982, at 467 (W.C. Clark ed., 1982)), <https://web.archive.org/web/20170118004650/http://cdiac.ornl.gov/pns/convert.html>.

184. *Id.*

185. Lindsey, *supra* note 182.

186. *Monthly Mean CO₂ Constructed from Daily Mean Values*, NAT'L OCEANIC & ATMOSPHERIC ADMIN. (2022), https://gml.noaa.gov/webdata/ccgg/trends/co2/co2_mm_mlo.txt (last visited Mar. 6, 2022).

187. *Id.* 1973 is the earliest year for which data about Alaskan oil extraction are available.

188. *Id.*

for roughly 1.2% of all CO₂ added to the atmosphere since 1973.¹⁸⁹

Measuring global temperature is a difficult task because measurements can vary substantially based on elevation, measurement tools, and inevitable interferences with measurements.¹⁹⁰ However, global temperatures strongly correlate with atmospheric CO₂.¹⁹¹ A National Oceanic & Atmospheric Administration report described a simple correlation: “When the carbon dioxide concentration goes up, temperature goes up. When the carbon dioxide concentration goes down, temperature goes down.”¹⁹² In recent decades, as atmospheric CO₂ has steadily risen, so too has global temperature.¹⁹³ In the past fifty years, estimates suggest that the increase has been about two degrees Fahrenheit¹⁹⁴ and shows signs of acceleration.¹⁹⁵

Alaska’s quantifiable contribution to global temperature change is nearly impossible to determine, given the lack of available information about how the state’s oil is used and the unreliability of current temperature change estimates. However, two known factors remain significant: the certainty in the fact that most of Alaska’s oil has been burned for fuel and the estimable effect this has had on atmospheric CO₂ concentration. These could be enough for a court to find that Alaska’s actions have had a tangible impact on atmospheric warming, and thus the melting of the permafrost, resulting in the destruction of Alaska Native village properties.

Up to this point, each argument discussed presents an opportunity for a court to take the side of Native Alaska villagers in a suit against the state, but numerous challenges exist that make such a possibility unlikely. Primary among these hurdles is the question of proximate cause.

189. Between 1973 and 2022, an additional 89.64 ppm of CO₂ was introduced to the atmosphere (calculated by taking the 1973 number and subtracting it from the 2022 number). Alaska’s contribution, 1.064 ppm, is 1.2% of 89.64. Alaska is therefore responsible for roughly 1.2% of the increase in CO₂ in the atmosphere between 1973 and 2022.

190. *Taking the Earth’s Temperature*, AM. CHEM. SOC’Y, <https://www.acs.org/content/acs/en/climatescience/energybalance/earthtemperature.html> (last visited Jan. 17, 2022).

191. NAT’L OCEANIC & ATMOSPHERIC ADMIN., NAT’L CTRS. FOR ENV’T INFO., TEMPERATURE CHANGE & CARBON DIOXIDE CHANGE, <https://www.ncdc.noaa.gov/global-warming/temperature-change> (last visited Jan. 17, 2022).

192. *Id.*

193. *Id.*

194. *World of Change: Global Temperatures*, NAT’L AERONAUTICS & SPACE ADMIN. EARTH OBSERVATORY, <https://earthobservatory.nasa.gov/world-of-change/global-temperatures> (last visited Jan. 17, 2022).

195. Steven J. Smith et al., *Near-Term Acceleration in the Rate of Temperature Change*, 5 NATURE CLIMATE CHANGE 333, 335 (2015), <https://www.nature.com/articles/nclimate2552.pdf>.

VI. STATE ACTION AND PROXIMATE CAUSE

With the argument for cause developed, a potential plaintiff must make the case that Alaska's involvement has been the *proximate* cause of the inverse condemnation of Alaska Native village property. Discussed in *Bakke v. State*¹⁹⁶ and clarified in *Beeson v. City of Palmer*,¹⁹⁷ proximate cause for the purpose of takings law in Alaska requires a basic finding that "the injury would not have occurred 'but for the act' and reasonable persons would regard this act 'as a cause and attach responsibility to it.'"¹⁹⁸ Proximate cause was first introduced as an element of an Alaska inverse condemnation question in *Bakke*, where a mudslide began on state property and destroyed a private plaintiff's property downslope; the court asked whether "the injury would have happened in exactly the same manner in the absence of the act."¹⁹⁹ However, borrowing from tort law to alter the test, *Beeson* established that for a state action "to be proximate[,] a cause must have been more likely than not a substantial factor in bringing about the injury."²⁰⁰ The court also noted that "[t]his does not preclude the possibility that there can be *multiple* substantial causes of damage."²⁰¹

A. The Case for Proximate Cause

Under either the hybrid or direct approach, the most robust case for proximate cause is that Alaska's leases served a singular purpose: to promote the extraction of oil.²⁰² Under the hybrid approach, Alaska was further involved because it encouraged the state's oil boom.²⁰³ Under either approach, the state encouraged oil extraction, and that oil was used almost exclusively for combustion.²⁰⁴ The combustion of oil is one of the leading causes of CO₂ emissions.²⁰⁵ CO₂ emissions directly impact warming global temperatures.²⁰⁶ Warming global temperatures are

196. 744 P.2d 655, 656 (Alaska 1987).

197. 370 P.3d 1084, 1089 (Alaska 2016).

198. *Id.* (quoting *Bakke*, 744 P.2d at 656).

199. *Bakke*, 744 P.2d at 656.

200. *Beeson*, 370 P.3d at 1090.

201. *Id.* (emphasis added).

202. *See supra* Sections IV(A)-(B).

203. *Id.*

204. *See* discussion *supra* Part IV.

205. *See Fossil Fuels*, ENV'T & ENERGY STUDY INST., <https://www.eesi.org/topics/fossil-fuels/description> (last visited Jan. 19, 2022) ("[I]n 2020, oil combustion was responsible for 45 percent of U.S. energy-related carbon dioxide emissions.").

206. *See* discussion *supra* Section V(A).

causing the permafrost in Alaska to melt.²⁰⁷ The melting permafrost is making property in dozens of Alaska Native villages unlivable.²⁰⁸

The move from the more stringent *Bakke* “exactly the same manner” analysis to the less stringent *Beeson* “multiple substantial causes” inquiry suggests that Alaska’s modern jurisprudential interpretation of inverse condemnation doctrine welcomes a broader range of possible contributions to an overall destructive result. Because of the scale of international CO₂ emissions²⁰⁹ and with the continued extraction of oil across the globe,²¹⁰ the chances are low of a court finding that the permafrost melt and destruction of Alaska Native villagers’ property would not have occurred in the “exact same manner.” Without any concrete understanding of what might have happened had Alaska not entered into oil leases, supported the development of the pipeline, and anchored itself to the fate of its oil extraction industry, a court would likely fall back on the idea that nothing would have been different: another source of oil would have been found somewhere else, and the same CO₂ would have been pumped into the atmosphere.

By contrast, the *Beeson* “substantial factor” analysis that considers multiple causes is slightly more favorable to potential inverse condemnation takings claims arising out of the melting permafrost. Alaska’s oil accounts for a quantifiable portion of global CO₂, which impacts global temperature.²¹¹ While that number is objectively small, Alaska courts have not drawn clear lines as to what constitutes a substantial contribution.²¹² Many other contributing factors do not, by themselves, impede an argument that Alaska has been a substantial contributor to the global temperature rise that has caused the permafrost to melt. There is therefore no need to consider hypothetical realities.

With tangible actions that have substantially contributed to tangible results, a takings claim may theoretically survive the proximate cause inquiry. However, even with the less stringent standard, the proximate cause inquiry presents the biggest challenge to an Alaska Native villager’s success in court. While both the direct and hybrid approaches carry distinct advantages, both may fall short due to current legal standards.

207. See *supra* Part II.

208. *Id.*

209. See discussion *supra* Section V(A).

210. See, e.g., *World Energy & Climate Statistics – Yearbook 2021: Crude Oil Production*, ENERDATA, <https://yearbook.enerdata.net/crude-oil/world-production-statistics.html> (last visited Jan. 19, 2022) (showing the continued global production of oil).

211. See discussion *supra* Section V(A).

212. See, e.g., *Beeson v. City of Palmer*, 370 P.3d 1084, 1090 (Alaska 2016) (failing to clarify what could have qualified as “substantial” for purposes of inverse condemnation analysis).

However, this could change in the future.

B. Proximate Cause as the Undoing of Both the Direct and Hybrid Approaches to State Action

The direct approach is named for its simplicity. Rather than opening the legal inquiry to the intricacies of Alaska's investment and support of the oil extraction industry, where money was not changing hands and the tangibility of the "action" proves somewhat ambiguous, the direct approach simply relies on the thousands of leases Alaska has proffered to oil companies. These leases are easily identifiable and thus allay concerns that an argument for a taking might devolve into a confusing mess of tangible and intangible factors on a long causal chain.

By contrast, the hybrid approach better enables a plaintiff to present Alaska's role as a consistent, actively participating party in the production of state oil. But bolstering the state action portion of the argument comes at the cost of diluting the significance of tangible state action oil leases.

Under either approach, the current jurisprudence does not favor a potential plaintiff. An Alaska court will need to acknowledge both that a causal chain exists and that Alaska's actions were the proximate cause of the resulting damage to Alaska Natives.²¹³ Although the substantial factor test for inverse condemnation takings claims has not been clarified since *Beeson*,²¹⁴ thus leaving it open for interpretation, the causal chain likely falls short. The sales of the leases, potentially coupled with long-term state investment in oil, has contributed little more than one percent to global CO₂.²¹⁵ This does not take into account the more direct instigators that are the oil companies themselves, nor does it correspond to actual contributions to global warming, which is correlated with CO₂ but has many other contributing factors.²¹⁶ While not directly addressed in Alaska courts, other U.S. courts, relying on slightly different standards, have refused to find causation resulting from individual entities' contributions to climate change.²¹⁷ For these reasons, based on current jurisprudence

213. See *supra* Part VI.

214. *Beeson* has not been cited for its "substantial factor" test, and no Alaska court has discussed the test since the *Beeson* decision in 2016.

215. See *supra* Section V(C).

216. See *The Causes of Climate Change*, NAT'L AERONAUTICS & SPACE ADMIN. GLOB. CLIMATE CHANGE, <https://climate.nasa.gov/causes/> (last visited Jan. 19, 2022) (listing some of the contributing factors to earth's warming, including water vapor, methane, nitrous oxide, and chlorofluorocarbons).

217. See *Native Village of Kivalina v. ExxonMobil Corp.*, 663 F. Supp. 2d 863, 881-82 (N.D. Cal. 2009) (failing to find a traceable link between oil, energy, and utility companies' emissions and any resulting arctic sea ice melt), *aff'd*, 696 F.3d 849 (9th Cir. 2012).

and climate science, it appears unlikely that Alaska courts would complete the causal chain to find an inverse condemnation from permafrost melt.

VII. OTHER MAJOR CONSIDERATIONS IN THE EFFICACY OF AN INVERSE CONDEMNATION TAKINGS CLAIM

An Alaska Native lawsuit against the State of Alaska for takings faces myriad challenges, even beyond the issue of proximate cause. While this Note seeks to present the strongest legal argument for a favorable outcome, many additional factors present obstacles not yet addressed. Two stand out as especially adverse to the success of an inverse condemnation claim deriving damage from Alaska's melting permafrost. First, any American environmental restitution case must overcome a massive hurdle: U.S. courts appear relatively unready or unwilling to treat climate change with a level of urgency comparable to the threat it actually poses to the country. Second, even if proximate cause and the jurisprudential aversion to climate change are overcome, takings law only presents a partial solution to the issues facing Alaska Native villages.

A. American Courts are Not Prepared for a Climate Reckoning

In recent decades, cases responding to the effects of climate change have given momentum to the reappropriation of old doctrines for modern environmental purposes.²¹⁸ While there are many reasons to be optimistic about judicial recognition of climate change, takings doctrine in Alaska is likely not ready to break new ground, even as the ground continues to break.

Climate change has been an issue in hundreds of cases,²¹⁹ and a central component of some major decisions in the past several decades.²²⁰ However, courts have consistently turned to several jurisprudential barriers that have undermined climate advocates' abilities to succeed.

218. See, e.g., Erwin Chemerinsky, *Keynote Address: The Alaska Constitution and the Future of Individual Rights*, 35 ALASKA L. REV. 117, 122 (2018) (discussing the public trust doctrine as a possible frontier for environmental litigation in Alaska).

219. See *U.S. Climate Change Litigation*, COLUM. LAW SCH. SABIN CTR. FOR CLIMATE CHANGE LAW, <http://climatecasechart.com/climate-change-litigation/us-climate-change-litigation/> (last visited Jan. 19, 2022) (citing hundreds of cases about climate change).

220. See, e.g., *Massachusetts v. EPA*, 549 U.S. 497 (2007) (discussing the EPA's ability to regulate and promulgate emission standards for carbon dioxide); *Comer v. Murphy Oil*, 585 F.3d 855 (5th Cir. 2009) (considering the justiciability of multiple claims against oil companies for their contributions to greenhouse gas emissions resulting in harm caused by Hurricane Katrina).

Namely, standing and political question non-justiciability have presented constant impediments to plaintiffs seeking compensation for or mitigation of damage.²²¹

Advocates have nonetheless carved out some victories. In *Massachusetts v. EPA*, not only did the Court recognize the harms caused by climate change (albeit relatively abstractly), but it also found that climate change being a global phenomenon did not prohibit a finding of particularized injury.²²² The Court noted that “climate-change risks [being] ‘widely shared’ does not minimize [the state’s] interest in the outcome of this litigation.”²²³ Petitioners seeking Environmental Protection Agency (EPA) regulation of greenhouse gases as air pollutants under the Clean Air Act won their biggest victory when the Court determined (1) that they had standing and (2) that their claims did not present nonjusticiable political questions.²²⁴

However, similar successes have been few and far between. Cases like *Native Village of Kivalina v. ExxonMobil Corp.* demonstrate just how much further U.S. courts must go before finding that a plaintiff affected by climate change may have grounds for restitution.²²⁵ In *Kivalina*, the plaintiff was the Inupiat village of Kivalina, one of the thirty-one Alaska Native villages deemed most at risk and likely in need of relocation.²²⁶ Relying on federal common law public nuisance doctrine, the Alaska Native village sought redress against twenty-four oil, energy, and utility companies for their contributions to global emissions that resulted in climate change and the subsequent melting of sea ice.²²⁷ The district court did not engage in the scientific inquiries required for such a claim, determining instead that it was a nonjusticiable political question²²⁸ and that the plaintiffs lacked standing.²²⁹

American courts have generally not shown a willingness to

221. See, e.g., *Juliana v. United States*, 947 F.3d 1159 (9th Cir. 2020) (dismissing substantive due process, equal protection, Ninth Amendment, and public trust doctrine claims against the U.S. government for involvement in the harmful effects of climate change for lack of standing); *Kivalina*, 663 F. Supp. 2d 863 (dismissing common law nuisance claim against oil, energy, and utility companies for greenhouse gas emissions that contributed to global warming, which caused erosion of arctic sea ice, as a nonjusticiable political question and for lack of standing).

222. *EPA*, 549 U.S. at 521.

223. *Id.* at 522.

224. *Id.* at 516, 526.

225. 663 F. Supp. 2d 863 (N.D. Cal. 2009), *aff’d*, 696 F.3d 849 (9th Cir. 2012).

226. See GAO 2009 UPDATE, *supra* note 38, at 1 (“In 2003, we examined flooding problems in 9 villages and identified 4[, including] Kivalina, . . . that were in imminent danger and were planning to relocate to less vulnerable sites . . .”).

227. *Kivalina*, 663 F. Supp. 2d at 868–69.

228. *Id.* at 873–77.

229. *Id.* at 877–82.

undertake even the basic scientific analysis required for arguments regarding climate change. If tried today, a state court hearing an Alaska Native inverse condemnation takings claim over permafrost melt would be unlikely to even address many of the questions presented in this Note, possibly dismissing on similar grounds to *Kivalina*.

B. The Potential for a Disjointed Success

Even in the wake of an unexpected victory in a takings claim, the limited scope of a takings claim undermines the lawsuit's effectiveness for addressing the root problem. Alaska's Takings Clause addresses only "[p]rivate property."²³⁰ Although rather obvious, this poses an additional barrier to takings law as an adequate response to the destruction of Alaska Native villages. While individuals may join to form a class action against the state, even in victory the awarded money is not optimized for the effective migration of the town. While people might recover for lost houses and businesses, there will be no such compensation to rebuild expensive destroyed municipal projects like schools, roads, and airports.

In effect, even after years of expensive litigation, victory would mean that Alaska Native villages may still lack sufficient funds to relocate.

VIII. CONCLUSION

An inverse condemnation action against the State of Alaska may not succeed today, but the legal experiment outlined in this Note provides a concrete theory upon which takings could be repurposed for environmental restitution, whether in Alaska or elsewhere.

For example, thousands of miles away from Alaska's west coast, hydraulic fracturing, commonly referred to as fracking, has been connected to the development of sinkholes and earthquakes throughout the contiguous U.S.²³¹ While individuals have sued the companies for fracking that caused damages to their homes,²³² this Note offers a

230. ALASKA CONST. art. I, § 18.

231. See, e.g., Josh Gabbatiss, *Oil and Gas Drilling Blamed for Sinkholes Threatening to Swallow Parts of Texas*, INDEPENDENT (Mar. 30, 2018, 2:45 PM), <https://www.independent.co.uk/climate-change/news/fracking-oil-gas-drilling-blamed-sinkholes-threatening-swallow-texas-earthquakes-a8281281.html> (discussing sinkholes developing in Texas due to fracking); Anna Kuchment, *Even if Injection of Fracking Wastewater Stops, Quakes Won't*, SCI. AM. (Sept. 9, 2019), <https://www.scientificamerican.com/article/even-if-injection-of-fracking-wastewater-stops-quakes-wont/> (discussing Oklahoma's major earthquakes being the result of fracking).

232. E.g., Arezow Doost, *Fracking Blamed in Lawsuit Filed by Families in Johnson County*, CBS DALL.-FORT WORTH (Aug. 16, 2013, 6:03 PM), <https://dfw.cbslocal.com/2013/08/16/fracking-blamed-in-lawsuit-filed-by->

framework by which they might also seek compensation from states directly. Similar arguments can also be made about river and oceanwater inundation and flooding throughout the country.

But for those Alaska Native villages sinking into the ground and sliding into rivers, something *must* be done. As legislative support wanes and executive agencies remain slow to act, the judicial branch offers another hope. If actions against private companies through other means are legally untenable, then a takings claim against the state provides a possible, feasible alternative.

families-in-johnson-county/ (describing lawsuit filed by Texas families against oil companies, alleging that fracking damaged their homes).