IN THE
SUPREME COURT OF VIRGINIA

SCV RECORD NO. 240684

LAYLA H., by her next friend Maria Hussainzadah, *et al*.,

Plaintiffs-Appellants,

v.

COMMONWEALTH OF VIRGINIA, *et al*.

Defendants-Appellees.

BRIEF OF *AMICUS CURIAE* VIRGINIA CLINICIANS FOR CLIMATE ACTION IN SUPPORT OF APPELLANTS

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I. INTEREST OF *AMICUS CURIAE*

Virginia Clinicians for Climate Action ("Virginia Clinicians") hereby files this brief as *amicus curiae* in support of Appellants.[1] Virginia Clinicians is an unincorporated association of over 450 medical professionals and allies who are focused on human-induced climate change and its worsening impacts on public health due to increased emission of greenhouse gas pollutants.[2] Virginia Clinicians, which studies the health benefits of climate solutions and the health dangers of inaction, published a report in 2022 on heat-related illnesses in Virginia, explaining the connection between public health harms and intensifying climate change.[3] Virginia Clinicians seeks to leverage this research and its members' expertise to help protect patients, families, and communities from the public health stressors of climate change. Samantha Ahdoot, MD, FAAP—a practicing pediatrician in Northern Virginia—is the current chair and founder of Virginia Clinicians.[4]

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[1] No party, party's counsel, or person other than the *amicus curiae*, its members, and its counsel contributed to the preparation or submission of this brief. Teddy Armstrong, UVA Law Class of 2026, is a Research Assistant with the Environmental Law and Community Engagement Clinic and contributed to the research, drafting, and editing of this brief.

[2] *About Us,* VA. CLINICIANS FOR CLIMATE ACTION, https://www.virginiaclinicians.org/copy-of-about-2 (last visited August 8, 2024).

[3] *Heat Illness in Virginia*, VA. CLINICIANS FOR CLIMATE ACTION (Feb. 2022), https://www.virginiaclinicians.org/2022-heat-illness-report.

[4] *About Us*, VA. CLINICIANS FOR CLIMATE ACTION, *supra* note 2.

II. ASSIGNMENT OF ERROR

Virginia Clinicians, as *amicus curiae*, alleges that the Court of Appeals erred in in its analysis of standing to sue on climate-related harms. Simply put, the injuries that Appellants have alleged are direct, concrete, and particularized. Indeed, the most acute harms articulated by Appellants — those associated with respiratory health — are supported by years of peer-reviewed, scientific research.[5] Time and again, researchers have documented the connection between fossil-fuel combustion and increased incidences of asthma, cardiovascular disease, reduced lung function, and respiratory hospitalization.[6]

The Court of Appeals also erred to the extent it relied on this Court's four-decade-old decision in *Robb v. Shockoe Slip Foundation*, 228 Va. 678 (1985), which stands in tension with other judicial opinions across the country that have interpreted similar environmental rights provisions in other state constitutions. *See, e.g., Clark Fork Coal. v. Mont. Dep't of Nat. Res. & Conservation*, 481 P.3d 198, 217 (Mont. 2021) ("The right to a clean and healthful environment is a fundamental right which government action may not infringe except as permissible under strict constitutional

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[5] *See* Gennaro D'Amato et al., *Climate Change and Respiratory Diseases.* 23 EUR. RESPIRATORY REV. 161 (2014); Hannah H. Covert et al., *Climate Change Impacts on Respiratory Health: Exposure, Vulnerability, and Risk*, 103 AM. PHYSIOLOGICAL REV. 2507 (2023).

[6] *See State of the Air*, AM. LUNG ASS'N, https://www.lung.org/research/sota (last visited Aug. 7, 2024).

scrutiny."); *Matter of Hawai'i Electric Light, Inc.*, 526 P.3d 329, 337 (Haw. 2023) (Wilson, J., concurring) ("the right to a life-sustaining climate system is also included in the due process right to 'life, liberty, [and] property' enumerated in Article I, section 5 and the public trust doctrine embodied in Article XI, section 1's mandate that the State of Hawai'i 'conserve and protect Hawai'i's...natural resources' '[f]or the benefit of present and future generations[.]'") (alterations in original). Recent scholarly debate has thus evaluated whether *Robb v. Shockoe Slip Foundation* should be reconsidered or reversed. *See* Tyler Demetriou, *Reinvigorating the Virginia Constitution's Environmental Provision*, 40. VA. ENVTL. L. J. 66, 89 (2022) ("*Shockoe Slip* clearly contradicts the legislative debates and framers' writings about Article XI….").

III. NATURE OF THE CASE AND MATERIAL PROCEEDINGS BELOW

While the Court of Appeals correctly ruled that Virginia's constitutional due process clause, VA. CONST. art. I, § 11, is "self-executing," it erred in holding that Appellants lack a remediable injury stemming from their climate-related harms. In reaching its conclusion on standing, the lower court relied, in part, on federal law, *see, e.g., Lujan v. Defenders of Wildlife,* 504 U.S. 555, 560 (1992). Yet the court failed to consider the United States Supreme Court's seminal decision on standing in climate change cases, *Massachusetts v. EPA,* 549 U.S. 497 (2007).

There, the Court held that a mere reduction in greenhouse gas pollution would be sufficient to uphold a finding that plaintiffs' injuries could be partially remedied. The *Massachusetts v. EPA* Court explained, "While it may be true that regulating motor-vehicle emissions will not by itself *reverse* global warming, it by no means follows that we lack jurisdiction.… A reduction in domestic emissions would slow the pace of global emissions increases, no matter what happens elsewhere." *Id.* at 525-26 (emphasis in original). That, of course, is precisely what Appellants' requested relief would provide as well – *a slowing of the pace* of global emissions increases.

IV. STATEMENT OF FACTS

Virginia Clinicians files this brief to affirm that the medical literature on public health strongly supports a factual finding that climate change and fossil-fuel development under statutes like the Virginia Gas and Oil Act, Va. Code § 45.2-1600 *et seq.*, are partly responsible for Appellants' respiratory, extreme heat, mental health, and infectious disease-related harms. Appellants' acute and immediate injuries include asthma attacks, heat exhaustion, and displacement due to flooding. These harms are strongly associated with the impacts of climate change.[7]

[7] *See, e.g.*, Edward Maibach, Howard Frumpkin & Samantha Ahdoot, *Health Professionals and the Climate Crisis: Trusted Voices, Essential Roles*, 13 WORLD MED. HEALTH & POL'Y 137 (2021), https://doi.org/10.1002/wmh3.421 ("Serious

V. AUTHORITIES AND ARGUMENT

Virginia Clinicians, with an expertise rooted in the medical and scientific literature, files this brief to highlight the correlation between the causes of climate change and their impacts on public health. Multiple studies show that the adverse health impacts of climate change disproportionately affect children and adolescents, and that these harmful health impacts are here now. Data from the National Oceanic and Atmospheric Administration, for example, confirm that human-induced climate change is causing temperatures in Virginia to rise—more than 1.5 degrees Fahrenheit since the beginning of the twentieth century.[8]

Granting Appellants' the relief they have requested with respect to the Virginia Gas and Oil Act, Va. Code § 45.2-1600 *et seq*., promises to mitigate at least some of the public health impacts they are now suffering. *Massachusetts v. EPA,* 549 U.S. at 525-26 (upholding plaintiffs' standing to sue even when the remedy they seek would not "by itself *reverse* global warming") (emphasis in original). This is because scientific research confirms that fossil-fuel development contributes to

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direct health harms of climate change result from increasingly extreme weather—including more frequent and severe heatwaves, storms, floods, and droughts. Indirect health harms resulting from secondary consequences of climate change are even more insidious—air pollution, vector-borne illness… mental health impacts….").

[8] J. Runkle et al., *Virginia State Climate Summary 2022*, NOAA TECH. REP. 1, 1 (2022), https://statesummaries.ncics.org/downloads/Virginia-StateClimateSummary2022.pdf.

climate change and harms public health.[9]

What is more, the adverse health impacts associated with climate change are happening now, harming children and adolescents here in the Commonwealth. The research summarized below documents health impacts across a range of metrics: 1) respiratory illness; 2) extreme heat; 3) mental health; and 4) infectious disease.

1. Respiratory Illness.

Physicians and health experts are seeing pediatric, respiratory injuries correlated with fossil-fuel use (*e.g.,* development under statutes like the Virginia Gas and Oil Act, Va. Code § 45.2-1600 *et seq*.,) and climate change.[10] Children exposed to high levels of air pollution suffer higher rates of oxidative stress, inflammation,

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[9] *See* María Mar Miralles-Quirós & José Luis Miralles-Quirós, *Decarbonization and the Benefits of Tackling Climate Change*, 19 INT' J. ENV'T RES. & PUB. HEALTH, June 2022, at 1–3, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9266008/pdf/ijerph-19-07776.pdf (describing the connection between fossil fuels, greenhouse gas emissions, climate change, and public health); Marco Grasso, *Oily Politics: A Critical Assessment of the Oil and Gas Industry's Contribution to Climate Change*, 50 ENERGY RSCH. & SOC. SCI. 106, 106, 112 (2019), https://doi.org/10.1016/j.erss.2018.11.017 ("It is possible . . . to surmise that the oil and gas industry has been a key contributor—directly through emissions . . .—to anthropogenic climate change and the related harm[s]…").

[10] Jill A. Poole, MD, et al., *Impact of Weather and Climate Change with Indoor and Outdoor Air Quality in Asthma: A Work Group Report of the AAAAI Environmental Exposure and Respiratory Health Committee*, 143 J. ALLERGY & CLINICAL IMMUNOLOGY 1702 (2019), https://www.jacionline.org/action/showPdf?pii=S0091-6749%2819%2930281-7.

and endothelial dysfunction.[11] The cellular damage caused by air pollution contributes to diseases like asthma and cancer.[12] These same pollutants have also been tied to harms occurring *in utero*, potentially leading to adverse birth outcomes.[13] Appellants, some of whom have pre-existing respiratory conditions such as asthma, are especially vulnerable to these impacts.[14] Moreover, research has demonstrated that anthropogenic climate change is extending the length of allergy seasons, causing additional harm to Appellants.[15, 16]

The takeaway here is that Appellants' chief allegation – that their respiratory harms are at least partially caused by fossil-fuel development in Virginia – is

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[11] Caroline J. Smith, *Pediatric Thermoregulation: Considerations in the Face of Global Climate Change*, 11 NUTRIENTS, Aug. 2019, at 1, 12, https://www.mdpi.com/2072-6643/11/9/2010.

[12] *See* Philip J. Landrigan et al., *The* Lancet *Commission on Pollution and Health*, 391 LANCET 462, 465 (2018), https://doi.org/10.1016/S0140-6736(17)32345-0; *see also* Heather L. Brumberg et al., *Ambient Air Pollution: Health Hazards to Children*, 6 PEDIATRICS 147 (2021), https://doi.org/10.1542/peds.2021-051484.

[13] Bruce Bekkar et al., *Association of Air Pollution and Heat Exposure with Preterm Birth, Low Birth Weight, and Stillbirth in the US: A Systematic Review*, JAMA NETWORK OPEN, June 18, 2020, at 1.

[14] *See* Gennaro D'Amato et al., *supra* note 5; Covert et al., *supra* note 5.

[15] *See* Yong Zhang et al., *Allergenic Pollen Season Variations in the Past Two Decades Under Changing Climate in the United States*, 21 GLOB. CHANGE BIOLOGY 1581 (2015); Lewis H. Ziska & Paul J. Beggs, *Anthropogenic Climate Change and Allergen Exposure: The Role of Plant Biology*, 129 J. ALLERGY & CLINICAL IMMUNOLOGY 27 (2012).

[16] *Living With Allergies*, AM. COLL. ALLERGY, ASTHMA, & IMMUNOLOGY, https://acaai.org/allergies/management-treatment/living-with-allergies/ (last visited Aug. 14, 2024) (allergies are the sixth-leading cause of chronic illness in the United States, costing more than $18 billion annually).

corroborated by the medical literature on public health, air pollution, and climate change.[17]

2. Extreme Heat

Appellants allege that extreme heat has negatively impacted their ability to live normal lives, and this allegation is also backed up by scientific and medical research.[18] Simply stated, extreme heat and rising temperatures associated with climate change have disproportionately negative effects on children and young adults like Appellants.[19]

The reason for this disproportionate impact is that children are uniquely susceptible to heat-related illnesses, which include heat stroke, heat exhaustion, respiratory disease exacerbations, and renal dysfunction.[20] Pregnancy complications

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[17] *See* Gennaro D'Amato et al., *supra* note 5; Covert et al., *supra* note 5.
[18] *See, e.g.,* U.S. Global Change Research Program, THE IMPACTS OF CLIMATE CHANGE ON HUMAN HEALTH IN THE UNITED STATES: A SCIENTIFIC ASSESSMENT (2016), https://health2016.globalchange.gov/ (describing the varied and significant ways in which climate change is already harming human health around the globe).
[19] *See* MARGARETHA BARKHOF ET AL., UNICEF & DATA FOR CHILDREN'S COLLABORATIVE, THE COLDEST YEAR OF THE REST OF THEIR LIVES: PROTECTING CHILDREN FROM THE ESCALATING IMPACTS OF HEATWAVES (2022), https://www.unicef.org/media/129506/file/UNICEF-coldest-year-heatwaves-and-children-EN.pdf.
[20] Daniel Helldén et al., *Climate Change and Child Health: A Scoping Review and an Expanded Conceptual Framework*, 5 LANCET PLANETARY HEALTH 164, 166 (2021), https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(20)30274-6/fulltext; Courtney W. Mangus & Therese L. Canares, *Heat-Related Illness in Children in an Era of Extreme Temperatures*, 409 PEDIATRICS REV. 97, 98 (2019), https://doi.org/10.1542/pir.2017-0322; Zhiwei Xu et al., *The*

are also a concern, as vulnerability begins before birth. Thus, maternal heat exposure has been associated with preterm birth and low birth weight, which may lead to long-term health consequences for the child.[21] Extreme heat may also impair learning, as exposure to higher temperatures has been associated with reduced cognitive function and loss of educational achievement.[22]

These harms should not be discounted, as some evidence suggests that "heatwaves kill more people [in the United States] than any other weather-related disaster," with children and infants having an elevated risk of mortality.[23, 24] When it comes to tolerating extreme heat, children and youth like Appellants are not merely small adults; they are more susceptible to harm than the population at large. [25]

3. Mental Health

Climate change, extreme weather, and fossil-fuel development under statutes

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Impact of Heat Waves on Children's Health: A Systematic Review, 58 INT'L J. BIOMETEOROLOGY 239, 244 (2013).

[21] Matthew F. Chersich et al., *Associations Between High Temperatures in Pregnancy and Risk of Preterm Birth, Low Birth Weight, and Stillbirths: Systematic Review and Meta-Analysis*, BJM, Nov. 4, 2020, https://doi.org/10.1136/bmj.m3811.

[22] R. Jisung Park et al., *Learning Is Inhibited by Heat Exposure, Both Internationally and Within the United States*, 5 NATURE HUM. BEHAV. 19, 19 (2021), https://doi.org/10.1038/s41562-020-00959-9.

[23] BARKHOF ET AL., supra note 19, at 14.

[24] Joshua Graff Zivin & Jeffrey Shrader, *Temperature Extremes, Health, and Human Capital*, 26 FUTURE OF CHILD. 31, 35 (2016), https://eric.ed.gov/?id=EJ1101427.

[25] *Id.* at 35.

like the Virginia Gas and Oil Act, Va. Code § 45.2-1600 *et seq*., can also cause severe and wide-ranging mental health harms, including increased levels of harmful stress,[26] spikes in psychiatric emergency room visits for depression and suicidal thoughts and behavior,[27] and diminished academic performance, with the potential for lifelong impairments.[28]

These harms affect some of the most elemental aspects of a child's upbringing. Children attending school in areas affected by extreme weather events, for example, exhibit diminished performance in reading and numeracy, and adolescents exposed to rising average temperatures experience increased delinquency and aggression.[29] One study found that during drought events, emergency room "visits for suicide and mood disorders in youth were 4.48 and 6.32 times higher, respectively, compared to non-drought periods."[30]

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[26] Caroline Hickman et al., *Climate Anxiety in Children and Young People and Their Beliefs About Government Responses to Climate Change: A Global Survey*, 5 LANCET PLANETARY HEALTH 863, 864 (2021), https://www.thelancet.com/action/showPdf?pii=S2542-5196%2821%2900278-3.

[27] Kelly Sewell et al., *Impacts of Compounding Drought and Heatwave Events on Child Mental Health: Insights from a Spatial Clustering Analysis*, DISCOVER MENTAL HEALTH, Jan. 2, 2024, at 8.

[28] Bradley Patrick White et al., *Mental Health Impacts of Climate Change Among Vulnerable Populations Globally: An Integrative Review*, ANNALS OF GLOB. HEALTH, Oct. 6, 2023, at 1, 8.

[29] Jennifer L. Barkin et al., *Effects of Extreme Weather Events on Child Mood and Behavior*, 63 DEVELOPMENTAL MED. & CHILD NEUROLOGY 785, 785-86 (2021).

[30] Sewell et al., *supra* note 27, at 18.

Abundant research confirms that climate-driven distress alters how children and young adults like Appellants envision their future.[31] Dr. Britt Wray, Ph.D., an instructor in Psychiatry and Behavioral Sciences at Stanford University, has described this phenomenon in stark terms: "Disasters that affect people directly exacerbate mental health disorders; droughts, hurricanes, heatwaves, floods, and wildfires have been shown, time and again, to spike post-traumatic stress disorder, anxiety, depression, suicidality, substance abuse, and other mental problems."[32] In sum, Appellants' allegations are wholly in accord with the medical literature documenting how climate change combines with government inaction to create chronic stress for children and adolescents.[33]

4. Infectious Disease

The threat of insect and water borne infectious diseases has increased in Virginia due to climate change and fossil-fuel development under statutory regimes like the Virginia Gas and Oil Act, Va. Code § 45.2-1600 *et seq*. The risks that Appellants face today are projected to compound as temperatures rise.

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[31] Hickman et al., *supra* note 26, at 868.
[32] BRITT WRAY, GENERATION DREAD: FINDING PURPOSE IN AN AGE OF CLIMATE ANXIETY 31 (2023) (paperback edition).
[33] Tara J. Crandon, *A Social-Ecological Perspective on Climate Anxiety in Children in Adolescents*, 12 NATURE CLIMATE CHANGE 123, 123–24 (2022), https://doi.org/10.1038/s41558-021-01251-y; Hickman et al., *supra* note 26, at 864.

Greenhouse gas pollution is augmenting the burden of infectious disease on youths, with evidence suggesting that children are particularly vulnerable to zoonotic, vector-borne, water-borne, and respiratory viruses linked to climate change.[34] Extreme weather events have disrupted and contaminated water systems, directly impacting infectious diseases by dispersing pathogens such as waterborne bacteria.[35] Climate change has also begun altering the ecology, geographic range, and number of disease-carrying mosquitoes and other insects in the United States.[36] "Climate-sensitive vector-borne illnesses transmitted by mosquitoes, ticks, and fleas, including Lyme disease and West Nile virus, tripled [domestically] between 2004-2016."[37] In sum, climate change and fossil-fuel development are accelerating Appellants' vulnerability to the specific injuries they have alleged.

VI. CONCLUSION

Scientific research consistently confirms the link between the causes of

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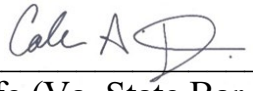
[34] S.D. Chitre et al., *The Impact of Anthropogenic Climate Change on Pediatric Viral Diseases*, 95 PEDIATRIC RSCH. 496, 497-498, 500 (2024).
[35] Paul J Edelson et al., *Climate Change and the Epidemiology of Infectious Diseases in the United States,* 76 CLINICAL INFECTIOUS DISEASES 950, 956 (2023); K.F. Cann et al., *Extreme Water-Related Weather Events and Waterborne Disease,* 141 EPIDEMIOLOGY & INFECTION 671 (2013).
[36] RENEE N. SALAS ET AL., 2018 LANCET COUNTDOWN ON HEALTH AND CLIMATE CHANGE BRIEF FOR THE UNITED STATES OF AMERICA 15 (2018); Augustina Delaney et al., *Population-Based Surveillance of Birth Defects Potentially Related to Zika Virus Infection—15 States and U.S. Territories*, 67 MORBIDITY & MORTALITY WKLY. REP. 91, 92 (2016).
[37] SALAS ET AL., *supra* note 36, at 1.

climate change and harms to human health. As Appellants' allegations demonstrate, Virginia's youth are in many ways uniquely exposed to physical and mental stress from extreme heat, extended pollen seasons, air pollution, and heightened environmental hazards in the places they live and play. The Virginia Gas and Oil Act, Va. Code § 45.2-1600 *et seq.*, contributes at least partially to the injuries that Appellants have alleged.

Respectfully submitted,



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CERTIFICATE OF SERVICE

I hereby certify that the following counsel have been served with a true and accurate copy, via electronic mail only, of the Motion of Virginia Clinicians for Climate Action Seeking Leave to File a Brief as *Amicus Curiae* in Support of Appellants, along with a true and accurate copy of the proposed brief:

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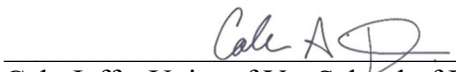

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