VIRGINIA:

IN THE COURT OF APPEALS OF VIRGINIA

LAYLA H., by her next friend Maria Hussainzadah, *et al.*, Plaintiff-Appellants, v. COMMONWEALTH OF VIRGINIA, *et al.* Defendant-Appellees.	Record No. 1639-22-2

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

Cale Jaffe (Va. State Bar. No. 65581)
Professor of Law, General Faculty
Director, Environmental Law and Community Engagement Clinic
University of Virginia School of Law
Tel: (434) 924-4776
cjaffe@law.virginia.edu

COUNSEL TO VIRGINIA CLINICIANS FOR CLIMATE ACTION

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I. STATEMENT OF IDENTITY OF *AMICUS CURIAE*

Virginia Clinicians for Climate Action, by and through undersigned counsel, hereby files this brief as *amicus curiae* in support of Appellants.[1] Virginia Clinicians for Climate Action ("Virginia Clinicians") is an unincorporated association of over 450 medical professionals and allies who are concerned about human-induced climate change and its worsening impacts due to increased emission of greenhouse gas pollutants.[2] As an entity, Virginia Clinicians focuses on the health benefits of climate solutions and the health dangers of inaction.[3] Virginia Clinicians has published a report on heat-related illnesses in Virginia, explaining the unmistakable connection between public health harms and intensifying climate change.[4] Virginia Clinicians seeks to leverage this research and its expertise to help protect patients, families, and communities from the public and environmental health stressors of

[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. Anna Sonju, UVA Law Class of 2024, and Elana Oser, UVA Law Class of 2023, are students enrolled in the Environmental Law and Community Engagement Clinic and have contributed substantially to the research, drafting, and editing of this brief.

[2] VA. CLINICIANS FOR CLIMATE ACTION, https://www.virginiaclinicians.org/ (last visited Feb. 12, 2023).

[3] Virginia Organizing, a non-partisan statewide grassroots organization, functions as the fiscal agent for Virginia Clinicians. Virginia Organizing is not seeking leave to submit a brief as *amicus curiae* or otherwise participate in this matter.

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

climate change. Samantha Ahdoot, MD, FAAP—a practicing pediatrician in Northern Virginia—is the current chair and founder of Virginia Clinicians.[5]

II. NATURE OF THE CASE

Appellants allege that they have suffered and continue to suffer acute, physical, and mental injuries connected to the impacts of climate change in Virginia and correlated with the Appellees' promotion of fossil fuel development under the Virginia Gas and Oil Act, VA. CODE § 45.2-1600 *et seq*. *See* Plaintiffs' Complaint for Declaratory and Injunctive Relief, at ¶¶ 19, 21–23, 28, 31–34, 40–41, 46, 49, 51–52, 54–56, 59, 61, 66, 69, and 71–73 (filed Feb. 9, 2022). Among other claims, Appellant LAYLA H. alleges that she experienced "heat exhaustion and heat rash" (¶ 19); Appellant AMAYA T. alleges difficulties managing her asthma (¶ 22); Appellants JULIAN SCHENKER and AVA L. allege exacerbated seasonal allergies (¶¶ 41, 46); Appellant TYRIQUE B. alleges that he suffers from alpha-gal syndrome,[6] a tick-related allergy (¶¶ 51-52); Appellants CEDAR B. and GIOVANNA F. allege to have suffered from Lyme disease from a tick bite made

[5] *About*, VA. CLINICIANS FOR CLIMATE ACTION, https://www.virginiaclinicians.org/about (last visited Feb. 12, 2023).

[6] Alpha-gal syndrome is an allergic reaction to the galactose-α-1,3-galactose sugar molecule, which is found in most mammals. The CDC defines it as "a serious, potentially life-threatening allergic reaction." *Alpha-gal Syndrome*, CTRS. FOR DISEASE CONTROL & PREVENTION, https://www.cdc.gov/ticks/alpha-gal/index.html (last visited Feb. 13, 2023).

more prevalent due to climate change (¶¶ 33, 55); and Appellant KATERINA LEEDY alleges to be suffering mental health impacts ("stress, anxiety and fear") brought on by witnessing the effects of worsening climate change (¶¶ 71–73).

Further, *amicus curiae* Virginia Clinicians adopts and incorporates by reference the "Statement of the Case," "Statement of Facts," and summary of the "Material Proceedings Below" as stated in the Appellants' Opening Brief, pages 1 through 8.

III. ASSIGNMENTS OF ERROR

1. The Circuit Court erred in finding that the Commonwealth enjoys sovereign immunity from Plaintiff-Appellants' allegations. *See* Record at 215.

2. The Circuit Court erred in finding that the Due Process Clause contained in the Bill of Rights in the Virginia Constitution, Article 1, § 11 is not, in this instance, self-executing. *See* Record at 215.

3. Further, *amicus curiae* Virginia Clinicians adopt and incorporate by reference the Assignments of Error as stated in the Appellants' Opening Brief, page 9.

IV. STANDARD OF REVIEW

"The existence of sovereign immunity is a question of law that is reviewed *de novo*." *City of Chesapeake v. Cunningham*, 268 Va. 624, 633 (2004). Further, the factual allegations as stated in Appellants' Complaint seeking Declaratory and Injunctive Relief "are taken as true" at this stage in the proceedings. *Gray v. Va. Sec'y of Transp.*, 276 Va. 93, 97 (2008) (internal citations omitted).

V. SUMMARY OF ARGUMENT

Amicus curiae Virginia Clinicians respectfully requests this Court to consider that: (1) the medical and scientific literature demonstrates that the adverse health impacts of climate change disproportionately affect adolescents, and that these harmful health impacts are here now; and (2) by mandating that Appellees maximize fossil fuel development, the Virginia Gas and Oil Act (the "Act" or "Challenged Act") stands in tension with two recently enacted laws, the Virginia Clean Economy Act and the Virginia Clean Energy and Community Flood Preparedness Act (collectively, the "Decarbonization Statutes"), further frustrating efforts to address the public health costs associated with climate change.

Virginia Clinicians' members bring an expertise rooted in the medical and scientific literature on climate change and public health. Studies and peer-reviewed research have documented an association between adverse, climate-related, public

health impacts and efforts to maximize fossil fuel production.[7] Thus, Appellants' injuries are unmistakably correlated, in part, with the Commonwealth's development of fossil fuel infrastructure under the Challenged Act.

The medical and scientific literature illustrates that the climate harms alleged by Appellants are linked to fossil fuel development.[8] Greenhouse gas emissions from fossil fuel use are a major contributor to climate change.[9] As expounded on below, the medical and scientific literature links these emissions to today's climate-induced health impacts resulting from increasing average temperatures and environmental hazards like extreme weather events, longer pollen seasons, and the spread of infectious diseases. In sum, the medical and scientific literature strongly supports a

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[7] The Intergovernmental Panel on Climate Change in its recently published Sixth Assessment Report synthesized current scientific understanding, and likewise drew the connection between fossil fuel development and associated greenhouse gas emissions, climate change, and adverse effects to human well-being. *See* HOESUNG LEE ET AL., SYNTHESIS REPORT OF THE IPCC SIXTH ASSESSMENT REPORT (AR6): SUMMARY FOR POLICYMAKERS 4, 6–7, 15, 25 (2023) [hereinafter IPCC SIXTH ASSESSMENT REPORT], https://report.ipcc.ch/ar6syr/pdf/IPCC_AR6_SYR_SPM.pdf.

[8] *See, e.g.*, Caren G. Solomon et al., *Fossil-Fuel Pollution and Climate Change—A New NEJM Group Series*, 386 NEW. ENG. J. MED. 2328, 2328 (2022), https://www.nejm.org/doi/pdf/10.1056/NEJMe2206300?articleTools=true.

[9] *See, e.g.*, Frederica Perera & Kari Nadeau, *Climate Change, Fossil-Fuel Pollution, and Children's Health*, 386 NEW. ENG. J. MED. 2303, 2303 (2022), https://www.nejm.org/doi/pdf/10.1056/NEJMra2117706?articleTools=true ("The combustion of fossil fuels (coal petroleum [oil], and natural gas) is the major source of both air pollution and the greenhouse-gas emissions driving climate change.").

finding that the adverse health effects of climate change are here now and are disproportionately harming children.[10]

Further, *amicus curiae* files this brief to highlight an important tension between the goals of the Challenged Act and the Decarbonization Statutes. The Challenged Act seeks to promote the development and production of "oil and gas reserves" and "maximize the production and recovery of coal without substantially affecting the right of a gas or oil owner . . . ."[11] The Decarbonization Statutes, in contrast, set the Commonwealth on a path to provide 100 percent of its electricity generation from "renewable and zero carbon sources"[12] and also direct Virginia's participation in the Regional Greenhouse Gas Initiative ("RGGI"), a free market-oriented, cap-and-trade program aimed at reducing climate-warming pollutants.[13] To the extent that the Challenged Act prioritizes fossil fuel production, it runs directly counter to the clean-energy goals of the Decarbonization Statutes and risks exacerbating the adverse public health impacts associated with climate change.

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[10] *Id.* at 2303–04 ("The fetus, infant, and child are especially vulnerable to exposure to air pollution and climate change, which are already taking a major toll on the physical and mental health of children. . . . [N]early every child around the world is considered to be at risk from at least one climate hazard.").
[11] VA. CODE § 45.2-1602.
[12] VA. CODE § 56-585.5.
[13] VA. CODE § 10.1-1330.

VI. ARGUMENT

Amicus curiae respectfully requests that the Court consider the scientific and public health findings on climate change and youth wellbeing in the Commonwealth of Virginia, especially in light of the Virginia Gas and Oil Act's mandate to "maximiz[e] exploration, development, production, and utilization of gas and oil resources . . . ."[14] A sample of the public health impacts of climate change are summarized below. In their Complaint seeking Declaratory and Injunctive Relief, Appellants have alleged suffering and injury from many of these same adverse health impacts.[15]

A. The Medical and Scientific Literature Shows that Climate-Related Adverse Health Effects Are Here and Impacting Adolescents.

Scientific research has confirmed, again and again, that continuing fossil fuel development contributes to climate change and the resulting ramifications on public

[14] VA. CODE § 45.2-1602(2).

[15] *See Morgan v. Bd. of Supervisors of Hanover Cnty.*, 883 S.E.2d 131, 141, 143–44 (Va. 2023) (internal citations omitted) ("[S]tanding requires particularized harm to 'be fairly traceable to the challenged action of the defendant. More flexible than traditional proximate-causation principles, the 'fairly traceable' concept 'does not mean that "the defendant's actions are the very last step in the chain of causation."' . . . A declaratory-judgment complaint can present a sufficiently ripe 'actual controversy' arising out of '"actual antagonistic assertions of denial of rights," even though no "consequential relief" is claimed at the time of the dispute.' In this way, the Declaratory Judgment Act provides a 'procedural remedy for the unripe, but legally viable, cause of action' . . . .").

health.[16] These adverse health impacts of climate change are happening now, disproportionately harming adolescents like Appellants—a fact that other courts around the country are recognizing.[17]

Virginians are acutely susceptible to the public health impacts of climate change.[18] And data from the National Oceanic and Atmospheric Administration confirm that human-induced climate change is causing temperatures in Virginia to

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[16] *See, e.g.*, 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 (noting that "[i]t 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" and including health as one of those harms).

[17] *In the Matter of the Application of Hawai'i Elec. Light Co., Inc.*, __ P.3d __, 2023 WL 2471890, at *8 (Haw. Mar. 13, 2023) (Wilson, J., concurring) ("I agree with the Majority [in upholding] . . . the right of Hawai'i's people to a clean and healthy environment, which subsumes the right to a life-sustaining climate system. I write separately to emphasize that the right to a life-sustaining climate system is also included in the due process right to 'life, liberty, [and] property' . . . and the public trust doctrine . . . ."); *Held v. Montana*, No. CDV-2020-307, slip op. at 14 (Mont. 1st Jud. Dist. Aug. 4, 2021) (holding that a "fail[ure] to consider or account for climate change" in environmental analyses implicates the "right to a clean and healthful environment" under Montana law); *Mont. Env't Info. Ctr. v. Dep't of Env't Quality*, 988 P.2d 1236, 1246 (Mont. 1999) ("[T]he right to a clean and healthful environment is a fundamental right because it is guaranteed by the Declaration of Rights found . . . [in] Montana's Constitution . . . .").

[18] David Malquist, *U.S. Sea-Level Report Cards: 2022 Once Again Trends Toward Acceleration*, VA. INST. MARINE SCI. (Mar. 7, 2023), https://www.vims.edu/newsandevents/topstories/2023/slrc_2022.php.

rise—more than 1.5 degrees Fahrenheit ("°F") since the beginning of the twentieth century.[19] These temperature increases are associated with the climate-related harms alleged by Appellants, along with frequent and intense heat waves and precipitation patterns.[20] Fossil fuel development writ large, which obviously includes the Commonwealth's program under the Challenged Act, is one of the largest contributors to climate change, currently accounting for three-fourths of greenhouse gas emissions.[21]

Today's higher temperatures caused by climate change have already been shown to have disproportionate negative effects on children's health.[22] These injuries include the kinds of public health harms alleged by Appellants. Indeed, a 2022 UNICEF report explains the connection between pediatric health and more frequent, intense heatwaves.[23] In the United States, "heatwaves kill more people than any other weather-related disaster," with children and infants having an elevated risk

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

[20] *Id.* at 3.

[21] Harro van Asselt, *Governing Fossil Fuel Production in the Age of Climate Disruption: Towards an International Law of 'Leaving it in the Ground'*, 9 EARTH SYS. GOVERNANCE, Oct. 2021, at 1, https://www.sciencedirect.com/science/article/pii/S2589811621000227#bib96.

[22] *See* MARGARETHA BARKHOF ET AL., THE COLDEST YEAR OF THE REST OF THEIR LIVES: PROTECTING CHILDREN FROM THE ESCALATING IMPACTS OF HEATWAVES (2022), https://www.unicef.org/reports/coldest-year-rest-of-their-lives-children-heatwaves.

[23] *Id.* at 9.

of mortality.[24] A review of public health literature suggests that "adults experience a 2 to 3 percent increase in mortality with every 1°C (1.8°F) rise in temperature above" 81°F, with the link between heat and illness in adults "concentrated among older people."[25] For children, mortality is estimated to be about 50 to 100 percent higher.[26] In addition to higher mortality rates, children make up almost half of the individuals affected by heat-related illnesses ("HRIs"), which include heat stroke, kidney-associated diseases, asthma, and loss of consciousness.[27]

An important takeaway here is that children are *not* merely small adults. Given the anatomical differences between children and adults, climate change renders children far more vulnerable than other age groups. They suffer higher rates of HRIs. Young people require more time to acclimate to high temperatures, produce more heat per unit of body mass, and sweat less.[28] Moreover, children lack the

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[24] *Id.* at 14.

[25] Joshua Graff Zivin & Jeffrey Shrader, *Temperature Extremes, Health, and Human Capital*, 26 FUTURE OF CHILDREN 31, 35–37 (2016), https://eric.ed.gov/?id=EJ1101427.

[26] *Id.* at 35.

[27] 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.

[28] Mangus & Canares, *supra* note 27, at 99; Bareket Falt & Raffy Dotan, *Children's Thermoregulation During Exercise in the Heat: A Revisit*, 33 APPLIED PHYSIOLOGY, NUTRITION, & METABOLISM 420, 421 (2008), https://pubmed.ncbi.nlm.nih.gov/18347699/; Expert Report of Susan E. Pacheco,

developmental capabilities to adapt their behavior to limit exposure and respond to extreme heatwaves.[29] These issues are especially pertinent for student-athletes, for whom HRIs are a leading cause of death and illness.[30]

Appellants have alleged several climate-related injuries due to increasing temperatures in Virginia. *See* Plaintiffs' Complaint for Declaratory and Injunctive Relief, at ¶¶ 19, 23, 28, 49, 54, 56, 59, 69, and 71. For example, Appellants AMAYA T., CLAUDIA SACHS, ELIZABETH M., KYLA H., and KATERINA LEEDY have all alleged to have suffered from heat-related illnesses while engaging in athletic training and competition. *See id.* ¶¶ 23, 28, 59, 69, and 71. Appellant AMAYA T. further alleges that heat-hazard precautions required team officials to cancel "several of her spring track meets . . . because of the extreme heat," thereby denying her the opportunity to compete. *Id.* ¶ 23.

As medical and public health professionals, *amicus curiae* Virginia Clinicians affirms that physicians are seeing pediatric respiratory health harms caused by fossil fuel use and the resulting climate change.[31] Planetary warming driven by fossil fuel

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MD & Jerome A. Paulson, MD, FAAP at 6, *Juliana v. United States*, 217 F.Supp. 3d 1224 (No. 6:15-cv-01517-TC) [hereinafter Expert Report], http://climatecasechart.com/wp-content/uploads/sites/16/case-documents/2018/20180628_docket-615-cv-1517_exhibit-1.pdf .

[29] Zivin & Shader, *supra* note 25, at 35.

[30] *Id.*

[31] 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*

pollution influences the duration and intensity of pollen seasons,[32] and the ensuing higher pollen counts disproportionately harm children.[33] Studies have established a link between elevated pollen counts and early spring onset with increased hospitalizations and emergency room visits in children with asthma.[34] Additionally, children exposed to high levels of air pollution suffer higher rates of oxidative stress, inflammation, and endothelial dysfunction.[35] This cellular damage caused by air pollution contributes to diseases like asthma, cancer, and neurodevelopmental disorders because of pollution.[36] High levels of ozone exposure also irritate

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Exposure and Respiratory Health Committee, 143 J. ALLERGY & CLINICAL IMMUNOLOGY 1702 (2019), https://doi.org/10.1016/j.jaci.2019.02.018.

[32] Lewis H. Ziska, *Temperature-Related Changes in Airborne Allergenic Pollen Abundance and Seasonality Across the Northern Hemisphere: A Retrospective Data Analysis*, 3 LANCET PLANETARY HEALTH 124 (2019), https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(19)30015-4/fulltext.

[33] William R.L. Anderegg, et al., *Anthropogenic Climate Change Is Worsening North American Pollen Seasons*, 118 PROCEEDINGS NAT'L ACAD. SCIS., Feb. 2021, https://doi.org/10.1073/pnas.2013284118.

[34] *See* Amir Sapkota, PhD, et al., *Association Between Changes in Timing of Spring Onset and Asthma Hospitalization in Maryland*, 3 JAMA NETWORK OPEN, July 2020, https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2767881; B. Erbas et al., *Outdoor Pollen Is a Trigger of Child and Adolescent Asthma Emergency Department Presentations: A Systematic Review and Meta-Analysis*, 73 ALLERGY 1632 (2018), https://pubmed.ncbi.nlm.nih.gov/29331087/.

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

[36] *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.

children's lungs, leading to asthma exacerbation and hospitalization[37] and reduced lung volumes and growth.[38] Tropospheric (i.e., ground-level) ozone is "the main ingredient in 'smog.'"[39] Concerns about worsening ozone conditions are especially relevant to Appellants' claims, as ozone is among the most sensitive pollutants to higher temperatures and a changed climate.[40]

The more severe impact on children occurs because children have "immature immune responses, small lung volumes, higher respiratory rates, tendency for mouth breathing, and longer time periods spent outside."[41] Appellants allege that they are already suffering acute respiratory harms like asthma and increased allergen sensitivity due to increased pollen and higher temperatures. *See* Plaintiffs' Complaint for Declaratory and Injunctive Relief, at ¶¶ 22, 34, 41, 46, 52, and 72.

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[37] Daniela Nuvolone, et al., *The Effects of Ozone on Human Health*, 25 ENV'T SCI. & POLLUTION RSCH. INT'L 8074 (2018), https://pubmed.ncbi.nlm.nih.gov/28547375/; Wanting Huang et al., *Ozone Exposure and Asthma Attack in Children*, 10 FRONTIERS PEDIATRICS, Apr. 2022, https://www.frontiersin.org/articles/10.3389/fped.2022.830897/full.

[38] Konstantina Dimakopoulou et al., *Long-term Exposure to Ozone and Children's Respiratory Health: Results from the RESPOZE Study*, 182 ENVT'L RSCH., Dec. 2019, https://pubmed.ncbi.nlm.nih.gov/31855698/.

[39] *Ground-level Ozone Basics*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/ground-level-ozone-pollution/ground-level-ozone-basics (June 14, 2022).

[40] John P. Dawson, et al., *Sensitivity of Ozone to Summertime Climate in the Eastern USA: A Modeling Case Study*, 41 ATMOSPHERIC ENV'T 1494, 1509 (2007), https://cfpub.epa.gov/ncer_abstracts/index.cfm/fuseaction/display.files/fileID/14201.

[41] Smith, *supra* note 35, at 12.

Fossil fuel pollution is also a leading cause of the increased frequency and length of children's exposure to environmental hazards.[42] In Virginia, climate change has increased the frequency of extreme rainfall events.[43] Increased incidents of heavy rainfall lead to a higher likelihood of flooding events.[44] After the floodwaters recede and homes are left with water damage, mold often proliferates.[45] Exposure to mold and its mycotoxins risks respiratory problems, inflammation, autoimmune disorders, and immune suppression.[46] Appellants allege experiencing extreme precipitation events that have resulted in flooding. *See* Plaintiffs' Complaint for Declaratory and Injunctive Relief, at ¶¶ 16, 18, 24, 29, 39, 45, 48, 53, 65, and 68. Appellant LAYLA H. also alleges she experienced the environmental hazard of mold firsthand, with "water damage and mold growth" in the basement of her home after an extreme rainfall event in 2018. *See id.* ¶ 16.

Even in the absence of extreme weather events, climate change has magnified the daily environmental hazards facing children in Virginia. Warming temperatures

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[42] Kristie L. Ebi, *Extreme Weather and Climate Change: Population Health and Health System Implications* 42 ANN. REV. PUB. HEALTH 293, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9013542/.
[43] JONATHAN L. GOODALL ET AL., THE IMPACT OF CLIMATE CHANGE ON VIRGINIA'S COASTAL AREAS, at vi, 4 (June 2021), https://scholarship.law.wm.edu/cgi/viewcontent.cgi?article=3083&context=facpubs. *See also* Jennifer Runkle et al., *State Climate Summaries 2022: Virginia*, NOAA NAT'L CTRS. FOR ENV'T INFO. (2022), https://statesummaries.ncics.org/chapter/va/.
[44] GOODALL ET AL., *supra* note 43, at 14.
[45] Expert Report, *supra* note 28, at 2, 15.
[46] *Id.* at 15.

linked to fossil fuel development are unquestionably a contributing factor to tick-range expansion and increased transmission of tick-borne illnesses.[47] The Virginia Department of Health has reported rising rates of Lyme disease and other tick-borne illnesses in recent years, with the expectation that the problem will persist.[48] While most children diagnosed with Lyme disease recover, more extreme cases can lead to arthritis or meningitis.[49] These symptoms can linger, interfering dramatically with daily life during a young person's formative years.[50] Appellants have alleged exposure to this environmental hazard firsthand. *See* Plaintiffs' Complaint for Declaratory and Injunctive Relief, at ¶¶ 33, 49, 51, 53, 55, and 63.

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[47] Rebecca J. Eisen et al., *Linkages of Weather and Climate with* Ixodes scapularis *and* Ixodes pacificus *(Acari: Ixodidae) in the Continental United States*, 53 J. MED. ENTOMOLOGY 349, 351 tbl.1 (2016) (reporting that in 1996 ticks were reported or established in twelve Virginia counties, whereas in 2015 ticks were reported or established in seventy-two counties). *See also* Dorothy Wallace et al., *Effect of Rising Temperature on Lyme Disease:* Ixodes scapularis *Population Dynamics and* Borrelia burgdorferi *Transmission and Prevalence*, 2019 CANADIAN J. INFECTIOUS DISEASES & MED. MICROBIOLOGY, Sept. 2019, https://doi.org/10.1155/2019/9817930; Daniel E. Sonenshine, *Range Expansion of Tick Disease Vectors in North America: Implications for Spread of Tick-Borne Disease*, 15 INT'L J. ENV'T RSCH. & PUB. HEALTH 478 (2018), https://doi.org/10.3390/ijerph15030478; Filip Dantas-Torres, *Climate Change, Biodiversity, Ticks and Tick-Borne Diseases: The Butterfly Effect*, 4 INT'L J. PARASITOLOGY: PARASITES & WILDLIFE 452 (2015), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4699983/.

[48] *Lyme Disease and Other Tickborne Illnesses Are Increasing*, VA. DEP'T HEALTH (Aug. 22, 2019), https://www.vdh.virginia.gov/news/archived-news-releases/2019-regional-news-releases/lyme-disease-and-other-tickborne-illnesses-are-increasing/.

[49] Jennifer S. Read, *Tickborne Diseases in Children in the United States*, 40 PEDIATRICS REV. 381, 383–84, 386 (2019), https://doi.org/10.1542/pir.2018-0304.

[50] *Id.* at 388.

Lastly, stress over climate change and greenhouse gas pollution harms the mental health of children. The medical literature is replete with documentation showing that climate change and government inaction are chronic stressors for children and adolescents.[51] A recent review of nearly a quarter-century worth of literature on climate change and child health found consensus among researchers that fear of climate change is leading to serious symptoms of anxiety and depression in younger populations.[52] Children and adolescents become more vulnerable to "increased worry" when they "believ[e] that the governmental responses are unsatisfactory."[53]

These impacts are proving to be acute. Mental health professionals find that stress over the present and future impacts of climate change can cause changes in "behavior, development, memory, executive function, decision-making, and

[51] 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; 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.

[52] Terra Leger-Goodes et al., *Eco-Anxiety in Children: A Scoping Review of the Mental Health Impacts of the Awareness of Climate Change*, 13 FRONTIERS PSYCH., July 2022, at 1, 3, 7, https://doi.org/10.3389/fpsyg.2022.872544.

[53] *Id.* at 7.

scholastic achievement."[54] Further, professionals have observed children developing post-traumatic stress following climate-induced disasters, in addition to obsessive-compulsive disorder, depression, and suicidal thoughts because of constant fears about a future out of their control.[55]

Appellants allege sincere and particularized concerns about the mental health impacts of climate change. *See* Plaintiffs' Complaint for Declaratory and Injunctive Relief, at ¶¶ 21, 27, 31–32, 40, 46, 50, 61, 66, and 73. For example, Appellant ELIZABETH M. affirms that "stress and anxiety over climate change impacts her daily life," reducing her "motivation to focus on accomplishing her goals" because of the continuing sense of dread that she feels. *See id.* ¶ 61. Similarly, Appellant KATERINA LEEDY suffers mental health impacts ("stress, anxiety and fear") because of climate change. *See id.* ¶ 73. Appellants have alleged specific injuries linked to climate change from which they are suffering now. *Amicus curiae* affirms that the medical literature on public health and the scientific literature on climate change strongly supports a finding that these adverse health impacts of climate change are being realized today in Virginia. The harm is acute and immediate.

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[54] SUSAN CLAYTON ET AL., MENTAL HEALTH AND OUR CHANGING CLIMATE: IMPACTS, IMPLICATIONS, AND GUIDANCE 6 (Mar. 2017), https://www.apa.org/news/press/releases/2017/03/mental-health-climate.pdf.

[55] *Id.* at 36. *See also* IPCC SIXTH ASSESSMENT REPORT, *supra* note 7, at 6 ("In assessed regions, some mental health challenges are associated with increasing temperatures (*high confidence*), [and] trauma from extreme events (*very high confidence*) . . . .").

B. The Virginia Gas and Oil Act Stands in Tension with Efforts to Mitigate Climate Change Under the Decarbonization Statutes.

By mandating that Appellees "maximiz[e] exploration, development, production, and utilization of gas and oil resources,"[56] the Challenged Act stands in stark tension with the Commonwealth's recently enacted efforts to retire all "electric generating units located in the Commonwealth that emit carbon as a by-product of combusting fuel to generate electricity."[57] Simply put, the Challenged Act compels the exploitation of carbon- and methane-emitting resources at a time when swift decarbonization is called for by other provisions of Virginia law in order to reduce the impacts of climate change and its resulting adverse health impacts.[58]

The statutory context of the Challenged Act emphasizes its hobbling effect on decarbonization. The Act, by its terms, was enacted to promote the "development," "production," and "utilization" of Virginia's "gas and oil resources."[59] The Act also

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[56] VA. CODE § 45.2-1602(2).
[57] VA. CODE § 56-585.5(B)(3).
[58] *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, 138 (2021), https://doi.org/10.1002/wmh3.421 ("The decarbonization of electrical and transportation systems provides a useful example. . . . [A]ny city, or state, or nation that shifts to renewable electricity will immediately realize benefits from cleaner air and water, healthier people, and reduced health costs."). *See also* VA. CODE § 45.2-1705(4) ("Climate change is an urgent and pressing challenge for the Commonwealth. Swift decarbonization and a transition to clean energy are required to meet the urgency of the challenge . . . .").
[59] VA. CODE § 45.2-1602(1), (2).

seeks to "maximize the production and recovery of coal without substantially affecting the right of a gas or oil owner . . . ."[60] Further, statutory duties of the Virginia Gas and Oil Board relate to: (1) the "exploration," "development," and "production" of "gas and oil resources"; (2) the promotion of "maximum production and recovery of coal without substantially affecting the right of a gas owner"; and (3) provisions "for the maximum recovery of coal."[61]

These provisions of the Act, which are expressly challenged in Appellants' Complaint,[62] stand in tension with the General Assembly's recently enacted Decarbonization Statutes. The Virginia Clean Economy Act of 2020 mandates that Virginia's leading investor-owned utilities, Dominion Energy Virginia and American Electric Power, shift to a zero-carbon electricity grid by 2045 and 2050, respectively.[63] Similarly, the Virginia Clean Energy and Community Flood

[60] VA. CODE § 45.2-1602(5).
[61] VA. CODE § 45.2-1603(b).
[62] *See* Plaintiffs' Complaint for Declaratory and Injunctive Relief, at ¶¶ 183–185, 187, 191–195.
[63] Virginia Clean Economy Act, H.B. 1526, 2020 Sess. (Va. 2020).

Preparedness Act of 2020 directs the Commonwealth to establish a carbon dioxide cap-and-trade program that complies with RGGI.[64, 65, 66]

On the one hand, the Decarbonization Statutes direct the Commonwealth's progress towards decarbonization. And yet on the other hand, the Challenged Act's purpose sharply diverges from that goal. By mandating that Appellees maximize production of fossil fuels, the purpose of the Challenged Act is hard to square with the General Assembly's more recent pronouncements in the Decarbonization Statutes.

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[64] Virginia Clean Energy and Community Flood Preparedness Act, H.B. 981, 2020 Sess. (Va. 2020).

[65] RGGI is a cooperative, regional cap-and-trade effort among Eastern states that seeks to reduce carbon dioxide emissions from power plants. *Elements of RGGI*, REG'L GREENHOUSE GAS INITIATIVE, https://www.rggi.org/program-overview-and-design/elements (last visited Feb. 15, 2023).

Pursuant to Executive Order No. 9, "Protecting Ratepayers from the Rising Cost of Living Due to the Regional Greenhouse Gas Initiative," the State Air Pollution Control Board under the Virginia Department of Environmental Quality has begun the regulatory process to end Virginia's participation in RGGI. Exec. Order No. 9 (Jan. 15, 2020), https://www.governor.virginia.gov/media/governorvirginiagov/governor-of-virginia/pdf/eo/EO-9-RGGI.pdf. This process is reviewing the repeal of Part VII of 9 VA. ADMIN. CODE § 5-140, the regulatory provision implementing Virginia's participation in RGGI. 39 Va. Reg. Regs. 1436 (Jan. 30, 2023).

[66] For market-based trading, the Act requires selling carbon allowances, and directing the bulk of the revenue towards the Virginia Community Flood Preparedness Fund and low-income energy efficiency programs. A small percentage of the funds cover administrative costs. *See* Virginia Clean Energy and Community Flood Preparedness Act, H.B. 981, 2020 Sess. (Va. 2020).

Indeed, permitting for and production of fossil fuels in Virginia persists at a breakneck pace. Since the Challenged Act was passed in 1990, the Commonwealth has dramatically increased production of methane gas, from 14,774 million-cubic-feet of gross withdrawals in 1990 to 102,824 million-cubic-feet of production in 2020, the year the Decarbonization Statutes became law.[67] By 2021, Virginia also accounted for more than a tenth of coalbed methane production in the United States.[68] Further, since July 1, 2020, when the Decarbonization Statutes went into effect, the Virginia Department of Energy has issued 5,135 fossil fuel related permits.[69] The most recent data also reveal that between 2020 to 2021, Virginia oil production increased by about 29 percent.[70] Coal production likewise increased 15 percent between 2020 to 2021,[71] and remained at an upward trajectory between 2022 and 2023 with a 0.9 percent increase.[72]

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[67] *Natural Gas: Virginia Natural Gas Gross Withdrawals*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/dnav/ng/hist/n9010va2a.htm (Jan. 31, 2023).

[68] *Virginia State Energy Profile*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/state/?sid=VA (last visited Feb. 27, 2023).

[69] Data was obtained from *Permit Issuance Statistics*, VA. DEP'T ENERGY, https://www.energy.virginia.gov/dgoinquiry/frmMain.aspx?ctl=53 (last visited Feb. 23, 2023). The date range input for these values was July 1, 2020 to February 23, 2023.

[70] *Oil*, VA. DEP'T ENERGY, https://www.energy.virginia.gov/geology/Oil.shtml (last visited Feb. 24, 2023).

[71] *Coal*, VA. DEP'T ENERGY, https://www.energy.virginia.gov/geology/coal.shtml (last visited Feb. 24, 2023).

[72] *Weekly U.S. Coal Production*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/coal/production/weekly/tables/weekly_production.php (Feb. 23, 2023).

Meanwhile, the Decarbonization Statutes have guided Virginia's participation in RGGI, a multistate regional compact that leverages free-market principles to effectively reduce greenhouse gas emissions from electricity generating facilities. States participating in the RGGI program have reduced their power plant carbon emissions by nearly 50 percent, outpacing the rest of the country by 22 percent.[73] In Virginia, power plant emissions have consistently decreased in the first two years of participation—by 12.5 percent between 2020 and 2021 and by nearly 8 percent between 2021 and 2022.[74] Methane emissions, a potent climate pollutant and the primary component of gas[75] extracted pursuant to the Challenged Act, have also been reduced under RGGI.

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[73] *See* ACADIA CENTER, THE REGIONAL GREENHOUSE GAS INITIATIVE: 10 YEARS IN REVIEW 1, https://acadiacenter.org/resource/the-regional-greenhouse-gas-initiative-ten-years-in-review/ (Oct. 2022).

[74] *EPA's Clean Markets Air Program Data*, U.S. ENV'T PROT. AGENCY, https://campd.epa.gov/data/custom-data-download (last visited Mar. 15, 2023).

[75] *Importance of Methane*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/gmi/importance-methane (June 9, 2022) ("Methane (CH_4) is . . . a primary component of natural gas. . . . Methane is the second most abundant anthropogenic GHG after carbon dioxide (CO_2), accounting for about 20 percent of global emissions. Methane is more than 25 times as potent as carbon dioxide at trapping heat in the atmosphere."); *Increase in Atmospheric Methane Set Another Record During 2021*, NAT'L OCEANIC & ATMOSPHERIC ADMIN. (Apr. 7, 2022), https://www.noaa.gov/news-release/increase-in-atmospheric-methane-set-another-record-during-2021 ("For the second year in a row, NOAA scientists observed a record annual increase in atmospheric levels of methane . . . . NOAA's preliminary analysis showed the annual increase in atmospheric methane during 2021 was 17 parts per billion (ppb), the largest annual increase recorded since systematic measurements began in 1983."); *Methane Emissions Are Driving Climate Change. Here's How to Reduce Them.*, UN ENV'T PROGRAMME (Aug. 20, 2021),

Decreased greenhouse gas emissions result in a range of avoided health effects regionwide. One study estimated that in just six years, states participating in RGGI realized at least $5.7 billion in health benefits from reduced emissions, including avoidance of at least 39,000 lost work or school days, a reduction of over 8,200 asthma attacks, and the prevention of between 300 and 830 premature deaths.[76] Truly, there is ample scientific evidence documenting the public health co-benefits of decarbonization.[77]

Simply put, the persistence of the Challenged Act's mandate of maximizing fossil fuel "exploration, development, production, recovery, and utilization"[78] hinders efforts to address climate change. Because the Act hobbles Virginia's ability

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https://www.unep.org/news-and-stories/story/methane-emissions-are-driving-climate-change-heres-how-reduce-them ("Methane is the primary contributor to the formation of ground-level ozone, a hazardous air pollutant and greenhouse gas, exposure to which causes 1 million premature deaths every year. Methane is also a powerful greenhouse gas. Over a 20-year period, it is 80 times more potent at warming that carbon dioxide. Methane has accounted for roughly 30 per cent of global warming since pre-industrial times and is proliferating faster than at any other time since record keeping began in the 1980s.").

[76] ABT ASSOCIATES, ANALYSIS OF THE PUBLIC HEALTH IMPACTS OF THE REGIONAL GREENHOUSE GAS INITIATIVE, 2009–2014, at 2 tbl.1 (2017), https://www.abtassociates.com/insights/publications/report/analysis-of-the-public-health-impacts-of-the-regional-greenhouse-gas-0.

[77] Ciaran L. Gallagher & Tracey Holloway, *Integrating Air Quality and Public Health Benefits in U.S. Decarbonization Strategies*, 8 FRONTIERS IN PUB. HEALTH 563358 (2020), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7717953/.

[78] VA. CODE § 45.2-1602(2).

to reduce greenhouse gas emissions under the Decarbonization Statutes, it also risks exacerbating the adverse public health impacts of climate change.

VII. CONCLUSION

Scientific research consistently confirms the link between climate change and harm to human health. Virginia is no exception. And as Appellants' Complaint demonstrates, Virginia's youth are in many ways acutely susceptible to climate-related injuries. Adverse public health impacts from climate change are uniquely felt by young people 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. Further, the tension between the purpose of the Virginia Gas and Oil Act with subsequent Virginia legislation (the Decarbonization Statutes) frustrates efforts to address the public health concerns that Appellants have raised.

Accordingly, *amicus curiae* Virginia Clinicians requests that this Court reverse the findings of the Circuit Court below: (1) that the Commonwealth enjoys sovereign immunity from Plaintiff-Appellants' allegations; and (2) that the Due Process Clause contained in the Bill of Rights in the Virginia Constitution, Article 1, § 11 is not, in this instance, self-executing. *Amicus curiae* Virginia Clinicians also requests that the matter be remanded to the Circuit Court for an evaluation of Plaintiff-Appellants' claims on the merits.

Respectfully submitted,

Cale Jaffe (Va. State Bar. No. 65581)
Professor of Law, General Faculty
Director, Environmental Law and Community Engagement Clinic
University of Virginia School of Law
Tel: (434) 924-4776
cjaffe@law.virginia.edu

COUNSEL TO VIRGINIA CLINICIANS FOR CLIMATE ACTION

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VIII. CERTIFICATE

I hereby certify on this 28th day of March, 2023, that the foregoing brief has been served by email on counsel listed below:

Counsel for Plaintiffs-Appellants:

Isak J. Howell, isak@howell-lawoffice.com
Nate Bellinger, nate@ourchildrenstrust.org
Kimberly Willis, kimberly@ourchildrenstrust.org

Counsel for Defendants-Appellees:

Andrew Ferguson, aferguson@oag.state.va.us
Steven Popps, spopps@oag.state.va.us
Jacqueline Hedblom, jhedblom@oag.state.va.us
Graham Bryant, gbryant@oag.state.va.us
Thomas Sanford, tsanford@oag.state.va.us
Annie Chiang achiang@oag.state.va.us
Charles Herbert Slemp, III, cslemp@oag.state.va.us

This brief contains 5,780 words.

Respectfully submitted,

Cale Jaffe (Va. State Bar. No. 65581)