TO THE HONORABLE MEMBERS OF THE
INTER-AMERICAN COMMISSION ON HUMAN RIGHTS,
ORGANIZATION OF AMERICAN STATES

EMERGENCY REQUEST FOR PRECAUTIONARY MEASURES PURSUANT TO ARTICLE 25 OF THE RULES OF PROCEDURE OF THE INTER-AMERICAN COMMISSION ON HUMAN RIGHTS ON BEHALF OF RESIDENTS OF ST. JOHN THE BAPTIST PARISH, LOUISIANA

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I. Summary

The Concerned Citizens of St. John ("Concerned Citizens") and the Tulane Environmental Law Clinic (TELC), as counsel for the Concerned Citizens, respectfully request precautionary measures under Article 25 of the Rules of Procedure of the Inter-American Commission on Human Rights ("Commission") and seek immediate protection for the people living near the Denka Performance Elastomer Neoprene facility (the "Denka/Dupont facility") in St. John the Baptist Parish,[1] Louisiana ("St. John"). "Precautionary measure[s are] a protection mechanism of the Inter-American Commission on Human Rights …, through which it requests a State to protect one or more persons who are in a serious and urgent situation from suffering irreparable harm.".[2] The State's[3] inadequate regulation of the Denka/Dupont facility and the pollutants it emits poses an imminent and irreversible threat to the rights to health, life, and personal integrity.[4]

The serious and urgent situation in St. John arises from the life-threatening and unparalleled burden of toxic air pollution, namely the carcinogenic chemical chloroprene, emitted from the Denka/DuPont facility. Petitioners request that the Commission direct the United States to immediately take all actions necessary to guarantee the health and safety of the people living near the Denka/Dupont facility, including but not limited to, establishing an enforceable national emission or air quality standard such that ambient air does not contain chloroprene at levels higher than 0.002 $\mu g/m^3$, compelling Denka Performance Elastomer LLC to cease operations at its facility in St. John until the community's safety is guaranteed, and ensuring continuous and technologically adequate community chloroprene monitoring by the State.

St. John is located in the heart of "Cancer Alley," a heavily-industrialized, 130-mile winding stretch of land along the Mississippi River in Louisiana, USA. Multiple independent data sources indicate that African American and impoverished communities in Cancer Alley are

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[1] A parish is a subset of the Louisiana state government structure equivalent to the county level in other states. *Parish Government Structure*, POLICE JURY ASSOCIATION OF LOUISIANA, https://www.lpgov.org/page/ParishGovStructure (last visited Mar. 26, 2021).

[2] Org. of Am. States, Rules of Procedure of the Inter-American Commission on Human Rights, Tit. II, Ch. II, Art. 25(1), 144th Reg. Period Sess. (Mar. 2013), http://www.oas.org/en/iachr/mandate/Basics/rulesiachr.asp [hereinafter IACHR Rules of Procedure] ("A precautionary measure is a protection mechanism of the Inter-American Commission on Human Rights (IACHR), through which it requests a State to protect one or more persons who are in a **serious and urgent situation from suffering irreparable harm**.")

[3] The word "State" refers to the United States and Louisiana state governments collectively. We include both because the United States government has delegated some responsibilities under the Clean Air Act to individual state governments, including Louisiana, while maintaining an oversight role.

[4] This request highlights life, health, and personal integrity as the violated rights which presently and immediately demand the imposition of precautionary measures. However, the focus on these rights does not suggest that U.S. and Louisiana state government actions and omissions in St. John the Baptist Parish have not violated other international human rights, including but not limited to, the rights to equality before the law; protection of honor, personal reputation, and private and family life; inviolability of the home; and the benefits of culture.

disproportionately burdened with industrial pollution (see Figure 1).[5] Even by Cancer Alley standards, St. John stands out as an area of extreme pollution-related health risks—all eleven census tracts in St. John are in the top 99.95th percentile nationally for cancer risk from air pollution.[6] One of the neighborhoods immediately surrounding the Denka/DuPont facility, Census Tract 708, is 92% African-American[7] and faces the highest air-pollution-related cancer risk in the United States.[8] This cancer risk is nearly 50 times higher than the national average and almost double the risk of the next highest census tract in the country. The United States Environmental Protection Agency (EPA) attributes 85% of the air-pollution-related cancer risk in this St. John neighborhood to exposure to a single, unusual pollutant: chloroprene.[9]

The sole producer of chloroprene in the United States is the Denka/Dupont petrochemical facility in St. John operated by Denka Performance Elastomer LLC ("Denka") that produces synthetic Neoprene rubber.[10] A recent survey-based, epidemiological study found that residential proximity to the Denka/DuPont facility is associated with a higher prevalence of cancer and other health problems associated with chloroprene exposure including headaches, dizziness, nosebleeds, chest pain, and heart palpitations.[11] Increased vulnerability to infectious disease imposes an additional layer of risk for this community because chloroprene is known to suppress

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[5] *See, e.g.,* Kimberly A. Terrell & Wesley James, *Racial Disparities in Air Pollution Burden and COVID-19 Deaths in Louisiana, USA, in the Context of Long-Term Changes in Fine Particulate Pollution*, Env't Justice 1, 7 (2020); Wesley James et. al., *Uneven Magnitude of Disparities in Cancer Risks from Air Toxics*, 9 Int'l J. of Env't Res. and Pub. Health, 4365, 4378-79 (2012); P.K.P. Perera and N. Lam, An Environmental Justice Assessment of the Mississippi River Industrial Corridor in Louisiana, US Using a Gis-Based Approach, 11 Applied Ecology and Environmental Research 681, 694-695 (2013).

[6] This percentile translates to the top 35 of 73,445 census tracts in the United States. *See 2014 NATA: Assessment Results*, U.S. EPA, https://www.epa.gov/national-air-toxics-assessment/2014-nata-assessment-results#nationwide (last visited Feb. 27, 2021) (providing national cancer risk summaries by source group).

[7] 2014-2018 American Community Survey Data, accessed via EJScreen Mar. 18, 2021. https://ejscreen.epa.gov/mapper/

[8] *See 2014 NATA: Assessment Results*, U.S. EPA, https://www.epa.gov/national-air-toxics-assessment/2014-nata-assessment-results#nationwide (last visited May 6, 2021) (providing national cancer risk summaries by source group in spreadsheet at https://www.epa.gov/sites/production/files/2018-08/nata2014v2_national_cancerrisk_by_tract_srcgrp.xlsx).

[9] *Id.* (providing national cancer risk summaries by pollutant in spreadsheet at https://www.epa.gov/sites/production/files/2018-08/nata2014v2_national_cancerrisk_by_tract_poll.xlsx). A summary of the 50 U.S. census tract facing the highest cancer risk is attached here as Appendix I.

[10] *See* U.S. EPA, Office of the Inspector General, *EPA Should Conduct New Residual Risk and Technology Reviews for Chloroprene and Ethylene Oxide-Emitting Source Categories to Protect Human Health*, p. 6-7 (May 6, 2021), *available* at https://www.epa.gov/sites/production/files/2021-05/documents/_epaoig_20210506-21-p-0129.pdf; Denka Performance Elastomer LLC is a joint venture company owned 70% by Denka Co. Ltd. and 30% by Mitsui Co. Ltd. *EPA in Louisiana: LaPlace, Louisiana – Background Information*, U.S. EPA https://www.epa.gov/la/laplace-louisiana-background-information (last visited Feb. 27, 2021).

[11] Ruhan Nagra et. al., *"Waiting to Die": Toxic Emissions and Disease Near the Denka Performance Elastomer Neoprene Facility in Louisiana's Cancer Alley*, 14 Env't Justice at 17 (2021) (attached as Appendix II to this document).

the immune system.[12] In April 2020, St. John was reported to have the highest death rate from COVID-19 in the United States.[13]

The U.S. and Louisiana governments violate internationally recognized human rights by failing to protect against chloroprene exposure in St. John. The American Declaration of the Rights and Duties of Man (the "Declaration") enumerates twenty-seven essential rights, including the right to life, liberty, and personal security[14] and the right to the preservation of health and to well-being.[15] The U.S. government jeopardizes the life and health of people living near the Denka/Dupont facility by failing to establish an enforceable national standard for chloroprene consistent with EPA's health protective value of 0.002 µg/m^3, allowing the Denka/DuPont facility to emit chloroprene such that ambient concentration levels far exceed EPA's 0.2 µg/m^3 limit of acceptability, and inadequately monitoring the local air quality.

The lack of State regulation or oversight of chloroprene emissions in St. John satisfies the elements necessary for an order of precautionary measures. The circumstances for residents near Denka/Dupont facility in St. John constitute (a) a serious situation that gravely threatens residents' life and health; (b) an urgent situation that is particularly threatening due to EPA's plan to end State community chloroprene monitoring and the residents' increased vulnerability to other adverse health effects, including COVID-19; and (c) the threat of irreparable harm to the residents' rights to health, life, and personal integrity. Accordingly, the Commission should adopt precautionary measures to protect against further harm.

II. Jurisdiction of the Commission

The Inter-American Commission on Human Rights has authority to receive and grant requests for precautionary measures under Article 25(1) of its Rules of Procedure.[16] In particular, precautionary measures are invoked under The Commission's mandate "to promote the observance and protection of human rights."[17] Where precautionary measures are essential to preserving the Commission's mandate under the OAS Charter, OAS member states, including the United States, have an obligation to implement such measures.[18] Furthermore, the

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[12] *See* U.S. EPA, *Chloroprene Hazard Summary* (2015), *available at* https://www.epa.gov/sites/production/files/2016-10/documents/chloroprene.pdf.

[13] Ashley Killough & Ed Lavandara, *This Small Louisiana Parish has the Highest Death Rate per Capita for Coronavirus in the Country*, CNN (Apr. 16, 2020, 1:39 AM), https://www.cnn.com/2020/04/15/us/louisiana-st-john-the-baptist-coronavirus/index.html.

[14] Organization of American States, American Declaration of the Rights and Duties of Man, O.A.S. G.A. Res. XXX, art. 1, O.A.S. Doc. OAS/Ser.L/V/I.4 Rev. 9 (1948) ("Every human being has the right to life, liberty, and security of his person.").

[15] *Id.* at art. 11. ("Every person has the right to the preservation of his health through sanitary and social measures relating to food, clothing, housing and medical care, to the extent permitted by public and community resources.").

[16] IACHR Rules of Procedure, *supra* note 2.

[17] OAS Charter Article 106.

[18] *See Raul Garza v. United States*, Case No. 12.243, Inter-Am. Comm'n H.R., Report No. 52/01, OEA/Ser.L/V/II.111, doc. 20, rev. ¶¶ 60 n.25, 117 (2000) ("[T]he American Declaration of the Rights and Duties of

Commission has regularly exercised its authority to issue precautionary measures in situations of environmental contamination threatening the human rights of American peoples.[19]

III. Beneficiaries

The members of the applicant organization Concerned Citizens of St. John reside near Denka/Dupont and are beneficiaries of this request for precautionary measures (the "beneficiaries"). Most of the Concerned Citizens of St. John members are among the approximately 5,200 residents of St. John the Baptist Parish who live within 2.5 kilometers of the Denka/DuPont facility (see Figure 2),[20] the area of EPA's community chloroprene monitor sites and where a peer-reviewed health study observed increased incidences of health effects associated with chloroprene exposure.[21] Notably, while the members of Concerned Citizens of St. John are the named beneficiaries of this request, the benefits of the precautionary measures will in fact extend to all persons residing in the 2.5 kilometer radius area, as well as to persons living, working, and recreating further from the Denka/Dupont site because EPA estimates of pollution-related health risks suggest that the affected community extends well beyond the 2.5-kilometer radius.[22]

Man is a source of international obligation for the United States and other OAS member states that are not parties to the American Convention on Human Rights, as a consequence of Articles 3, 16, 51, 112, and 150 of the OAS Charter.").

[19] *See generally, e.g.*, *Inhabitants of the areas near the Santiago River regarding Mexico*, Precautionary Measures, Resolution, Inter-Am. Comm'n H.R., Resolution No. 07/20 (Feb. 5, 2020) (requesting that Mexico adopt precautionary measures where contamination of the Santiago River was disproportionately threatening the health of populations near the river); *Marcelino Díaz Sánchez y otros respecto de México* [Marcelino Díaz Sánchez and others regarding Mexico], Precautionary Measures, Resolution, Inter-Am. Comm'n H.R., Resolution No.24/19 (Apr. 23, 2019) (requesting that Mexico adopt precautionary measures where a disregard of protocols and lack of government supervision resulted in toxic pollution from a landfill, causing nearby residents to develop cancer, gastrointestinal infections, and respiratory diseases); *Comunidad Nativa "Tres Islas" de Madre de Dios respect de Perú* [Native Community "Tres Islas" of Madre de Dios regarding Peru], Precautionary Measures, Resolution, Inter-Am. Comm'n H.R., Resolution No. 38/17 (Sept. 8, 2017) (requesting that Peru adopt precautionary measures where pollution from mining concessions granted by the State led to unhealthy levels of mercury in the residents of the nearby community, as well as their sources of food and water).

[20] *See* Figure 2.

[21] Nagra, et al., *supra* note 11, at 17. At the time of the health survey, this geographic area encompassed a total of 1,821 households (445 households within a 1.5-kilometer radius of the plant and 1,376 households located between 1.5 and 2.5 kilometers of the plant). *Id. See also* 2014-2018 American Community Survey data, accessed via EJScreen on Mar. 19, 2021. https://ejscreen.epa.gov/mapper/.

[22] *EJScreen Report (Version 2020), St. John the Baptist Parish*, EJScreen https://ejscreen.epa.gov/mapper/ (accessed May 8, 2021). EJScreen is EPA's own environmental justice screening and mapping tool that can generate reports on county-level environmental information, including cancer risk from air toxics. The EJScreen report for St. John the Baptist Parish is attached to this request as Appendix III.

IV. Statement of Facts

A. The U.S. Government Consistently Prioritizes Industry Over the Health and Well-Being of St. John Residents, Evidenced by Historic Patterns of Exploitation and Consolidation of All Domestic Chloroprene Production in St. John.

St. John the Baptist Parish straddles the Mississippi River in southeast Louisiana between Baton Rouge and New Orleans. St. John consists of seven communities situated along the Mississippi River; on the East Bank: LaPlace, Reserve, Garyville, and Mt. Airy, and on the West Bank: Edgard, Wallace, and Lucy.[23] Like much of Cancer Alley, where many residents can trace their lineage back generations to formerly enslaved African Americans who were forced to labor on plantations where industrial facilities now stand, the land has a long history of exploitation and violence against African Americans in the name of economic profit.[24] In the 18th and 19th centuries, the Belle Pointe plantation, located where the Denka/DuPont facility now stands, enslaved more than 150 African Americans. [25] After the Civil War, sharecropping took the place of slavery and, eventually, chemical giant E.I. DuPont de Nemours ("DuPont") bought the land and constructed a Neoprene production plant.[26]

DuPont began producing Neoprene at its facility in St. John in 1969. At the time, DuPont operated two other Neoprene facilities in the United States in Rubbertown, Kentucky and Montague, Michigan.[27] In 1972, DuPont ceased facility operations in the majority white neighborhood of Montague.[28] Later, in 1985, Montague and its neighboring communities were labeled an "Area of Concern" on an international list of "toxic hotspots" due to the pollution caused in part by the DuPont plant.[29] In 2008, DuPont permanently closed its facility in the

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[23] U.S. Census Bureau, *Census Tract Reference Map: St. John the Baptist Parish, LA* (2010), https://www2.census.gov/geo/maps/dc10map/tract/st22_la/c22095_st_john_the_baptist/DC10CT_C22095_001.pdf.
[24] *See, e.g.*, Climate Nexus, *Plastics Plant Will Bulldoze Over Black History in 'Cancer Alley'*, EcoWatch (Dec. 20, 2019, 11:34 AM), https://www.ecowatch.com/formosa-plastics-louisiana-slave-burial-ground-2641658521.html (noting that the major plastic manufacturing complex run by Formosa Plastics in St. James Parish may disrupt a historic burial site for enslaved ancestors of the area); Living on Earth, *Human Rights in 'Cancer Alley'*, The World (Apr. 26, 2010, 7:15 AM), https://www.pri.org/stories/2010-04-26/human-rights-cancer-alley (noting that descendants of the emancipated slaves who founded Mossville, Louisiana lived on the land for generations until the construction and subsequent pollution of fourteen petrochemical factories forced residents from their homes).
[25] Oliver Laughland & Jamiles Lartey, *First Slavery, Then A Chemical Plant and Cancer Deaths: One Town's Brutal History*, The Guardian (May 6, 2019, 6:00 AM), https://www.theguardian.com/us-news/2019/may/06/cancertown-louisiana-reserve-history-slavery (noting that the present-day Denka/DuPont facility is located on a former plantation).
[26] *Id.* (quoting one Reserve resident as saying, "When you think about it, nothing has ever really changed. . . .First slavery, then sharecropping, now this. It's just a new way of doing it.").
[27] *E.I. du Pont de Nemours & Company Pontchartrain Works Records*, Hagley Museum & Library, https://findingaids.hagley.org/repositories/3/resources/1183 (last visited Feb. 27, 2021).
[28] *Id.*
[29] *See* White Lake Env't Hist. Project, *Restoring White Lake: Exploring White Lake's Environmental History* (2012), http://restoringwhitelake.com/restoration_history_timeline.pdf.

majority white neighborhood of Rubbertown[30] due to concerns over its environmental and health impacts.[31] A year earlier, in 2007, a district director of the United Steelworkers wrote a letter to then-Governor of Louisiana, Kathleen Blanco, warning her that the consolidation of Neoprene production at the Denka/DuPont facility in St. John following the Montague and Rubbertown closures would harm local residents, insisting that "[t]he real costs will be borne by the citizens of Louisiana, not Dupont."[32] Nonetheless, DuPont continued to operate its facility in a majority African American area of St. John.

For over 50 years, the Denka/DuPont facility has silently poisoned communities around it, including in St. John and neighboring parishes, communities now defined by the industrial plants that surround them. These plants release a variety of harmful, airborne chemicals, including ethylene oxide, ammonia, chlorine, hydrogen cyanide, sulfuric acid, hydrochloric acid,[33] and toluene.[34] The Concerned Citizens of St. John focus their concern here on the Denka/DuPont facility as the sole producer of the dangerous toxin chloroprene.[35]

B. Chloroprene Emissions from the Denka/DuPont Facility Significantly Elevate the Risk of Developing Cancer and Non-Cancer Illnesses for St. John Residents.

i. Residents of St. John have the highest risk of cancer attributable to air pollution in the United States—more than three times higher than the second most at-risk county.

Exposure to chloroprene – a highly toxic carcinogen – from the Denka/DuPont facility imposes an extremely high risk of cancer on beneficiary residents of St. John. It is well-established that

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[30] Ky. State Data Ctr. & Metro United Way, *Rubbertown Neighborhood Profile* 2 (2017), http://ksdc.louisville.edu/wp-content/uploads/2018/06/Rubbertown.pdf (reporting that 56% of Rubbertown's population identified as white as of the 2010 U.S. Census).

[31] Sharon Lerner, *The Plant Next Door*, The Intercept (Mar. 24, 2017, 9:56 AM), https://theintercept.com/2017/03/24/a-louisiana-town-plagued-by-pollution-shows-why-cuts-to-the-epa-will-be-measured-in-illnesses-and-deaths/ ("Under pressure from workers and environmental groups in Kentucky, DuPont closed its Rubbertown plant in 2008.").

[32] Jeanne Lim, *DuPont Louisiana Neoprene Unit May Pose Danger*, Indep. Commodity Intelligence Serv. (Sept. 3, 2007), https://www.icis.com/explore/resources/news/2007/09/03/9058871/dupont-louisiana-neoprene-unit-may-pose-danger/ (quoting United Steelworkers District 8 director Billy Thompson).

[33] *See* LDEQ, *Annual Certified Emissions Data, 1991-present* (2021, *available at* https://www.deq.louisiana.gov/assets/docs/Air/EmissionsInventory/ERIC/All_Certified_Emissions.xlsx (data sorted by parish); *see also* Rick Jervis and Alan Gomez, *Racism Turned Their Neighborhood into 'Cancer Alley.' Now They're Dying from COVID-19*, USA Today (Dec. 8, 2020, 8:05 PM), https://www.usatoday.com/in-depth/news/nation/2020/10/12/covid-racism-kills-black-americans-living-near-toxic-plants/3498180001/; Della Hasselle and Nick Reimann, *In Louisiana's River Parishes, another possible cancer-causing agent in the air, EPA says*, Nola.com (Sept. 29, 2018, 5:00 p.m.), https://www.nola.com/news/environment/article_7f1c64f8-6fe3-5a5c-9a37-8908bdadbb72.html.

[34] The Denka/Dupont facility reported emissions of over 6600 lbs. of toluene in 2019. LDEQ, *Annual Certified Emissions Data, supra* note 33. This spreadsheet shows all emissions reported by facilities to LDEQ.

[35] *See* discussion *infra* subpart IV.D.i (noting that EPA attributes 85% of the total cancer risk attributed to air pollution to chloroprene exposure for the census tract immediately adjacent to the Denka/DuPont facility).

exposure to chloroprene can cause cancer and other serious illnesses. EPA classifies chloroprene as a "likely human carcinogen."[36] According to EPA, chloroprene causes a cancer risk of 100-in-1 million, or what it typically defines as "the upper limit of acceptability for risk-based decisions," at exposure levels of 0.2 $\mu g/m^3$ ("limit of acceptability").[37] Furthermore, EPA has said that it is preferable to reduce chloroprene exposure to concentrations below 0.002 $\mu g/m^3$, ("health protective value") which causes a 1-in-1 million cancer risk. EPA also assigned chloroprene an Inhalation Unit Risk (IUR) value of $3x10^{-4}$ $\mu g/m^3$.[38] An IUR value estimates "the increased cancer risk from inhalation exposure to a concentration of 1 $\mu g/m^3$ for a lifetime."[39] Chloroprene's IUR value is drastically higher than many other industrial pollutants—for example, it is more than 136 times higher than that of benzene[40] and 38-68 times higher than that of vinyl chloride.[41]

The beneficiaries who live in Census Tract 708 face the highest cancer risk from air pollution in the United States with a risk almost twice that of the next highest Census tract.[42] EPA attributes 85% of this risk to chronic chloroprene exposure – of which the Denka/Dupont facility is the area's only source.[43] Census Tract 708 includes a two square mile area that encompasses the Denka/Dupont facility and nearby homes - about one third of the Reserve community.

In general, residents of St. John face a higher risk of developing cancer as a result of exposure to air pollution than 99.95% of Americans.[44] EPA's 2014 National Air Toxics Assessment (NATA) showed that St. John the Baptist Parish has a higher total cancer risk attributable to air pollution

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[36] U.S. EPA, *Table 1. Prioritized Chronic Dose-Response Values for Screening Risk Assessments* (Jun. 18, 2018), https://www.epa.gov/sites/production/files/2014-05/documents/table1.pdf (reporting an International Agency for Research on Cancer classification of 2B ("possibly carcinogenic") and an EPA classification of LH ("likely to be carcinogenic")).

[37] *See* Memo from Kelly Rimer, Leader, Air Toxics Assessment Group, Health & Envt'l Impacts Div., OAQPS, to Frances Verhalen, P.E., Chief, Air Monitoring/Grants Section, EPA Region 6, Re: Preliminary Risk-Based Concentration Value for Chloroprene in Ambient Air (May 5, 2016), https://www.epa.gov/sites/production/files/2016-06/documents/memo-prelim-risk-based-concentrations050516.pdf ("2016 EPA Chloroprene Memo").

[38] U.S. EPA, *Integrated Risk Information System (IRIS) Chemical Assessment Summary: Chloroprene; CASRN*: *126-99-8 15* (2010), https://iris.epa.gov/ChemicalLanding/&substance_nmbr=1021.

[39] *Basic Information About the Integrated Risk Information System*, U.S. EPA, https://www.epa.gov/iris/basic-information-about-integrated-risk-information-system#:~:text=(IUR)%20is%20an%20estimate%20of,estimate%20the%20lifetime%20cancer%20risk (last visited Mar. 6, 2021).

[40] U.S. EPA, *Integrated Risk Information System (IRIS) Chemical Assessment Summary: Benzene; CASRN 71-43-2 30* (2010), *available at* https://iris.epa.gov/static/pdfs/0276_summary.pdf (reporting an IUR value range of $2.2x10^{-6}$ $\mu g/m^3$ to $7.8x10^{-4}$ $\mu g/m^3$).

[41] U.S. EPA, *Integrated Risk Information System (IRIS) Chemical Assessment Summary: Vinyl Chloride; CASRN 75-01-4 42* (2010), *available at* https://iris.epa.gov/static/pdfs/1001_summary.pdf (reporting an IUR value of ($4.4x10^{-6}$ $\mu g/m^3$).

[42] *See* U.S. EPA, *EJSCREEN Report*, *supra* note 23 (reporting that census tract has a total cancer risk of 1,505.1167 per million, followed by census tract 601 in St. Charles Parish, Louisiana with a total cancer risk of 808.7227 per million).

[43] *See 2014 NATA Assessment Results*, *supra* note 8 (providing national cancer risk summaries by pollutant).

[44] *See id.*

than any of the other 3,284 counties in the United States and a risk more than three times that of the next highest county/parish.[45]

ii. People living near the Denka/Dupont facility, especially children, regularly experience serious chloroprene-related adverse health effects.

In addition to cancer, exposure to chloroprene can also cause other serious and life-threatening health effects and is especially dangerous for children. According to EPA, chronic exposure to chloroprene can cause "respiratory, eye and skin irritation, chest pains, temporary hair loss, neurological symptoms . . . , [and] [e]ffects to the cardiovascular system . . .."[46] A peer-reviewed study of residents within a 2.5 kilometer radius of the Denka/Dupont facility, published by the University Network for Human Rights (UNHR) in 2021, determined "that high proportions of respondents regularly experience cardiac symptoms, difficulty breathing, headaches, eye irritation, respiratory symptoms, skin irritation, and fatigue."[47] The UNHR study concluded that the incidence of chloroprene-linked health symptoms is associated with the proximity to the Denka facility.[48] This finding directly links the prevalence of adverse health outcomes in St. John to air pollution from the Denka/DuPont facility, as opposed to pollution from other facilities or other external or genetic factors. Furthermore, the UNHR study reported that nearly half of the respondents who live within 1.5 kilometers of the Denka/DuPont facility "smell chemical odors *inside* their homes 'at least a few times per month,'" emphasizing the pervasiveness of the pollution.[49]

Children are among the least protected and the most at-risk for the health impacts of the air pollution in St. John. As the UNHR study noted "children are more susceptible than adults to the toxic effects of chloroprene exposure."[50] Children who live and/or attend school near the Denka/DuPont facility commonly experience headaches and nosebleeds.[51] There are three schools located within 2.5 kilometers of the Denka/DuPont facility, with one – Fifth Ward Elementary – located only three blocks away, and several more located just beyond (see Figure 3). In 2015, the Louisiana Department of Health investigated the conditions at another nearby school, East St. John Elementary, in response to student complaints of "stomach ache, headache, sore throat, chest tightness, vomiting, burning eyes/nose, dizziness, fever, nausea, and weakness."[52] The Department of Health recommended that this school be relocated "at the

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[45] *See 2014 NATA: Assessment Results*, *supra* note 8 (reporting that St. John the Baptist Parish has a total cancer risk of 413.3152 per million, followed by St. Charles Parish, Louisiana with a total cancer risk of 136.5957 per million).
[46] U.S. EPA, *Chloroprene Hazard Summary*, *supra* note 12, at 2.
[47] *See* Nagra, et al., *supra* note 11, at 23.
[48] *Id*. at 14.
[49] *Id*. at 22 (emphasis added).
[50] *Id*. at 17 (citing U.S. Environmental Protection Agency, "Toxicological Review of Chloroprene," September 2010, https://www.epa.gov/sites/production/files/2016-10/documents/chloroprene.pdf.
[51] *Id*.
[52] *See* U.S. EPA Action Plan (June 2016) Denka Performance Elastomer, LLC – Pontchartrain Facility (Formerly The Dupont Neoprene Facility, Pontchartrain Works), LaPlace, St. John Parish, at 5, *available at*

earliest possible time" and that in the interim the school "should have a plan to minimize the entry of particulates into the school and to manage indoor air quality."[53]As of May 2021, that location of East St. John Elementary is now a high school,[54] and Fifth Ward Elementary remains open three blocks from the Denka/Dupont fence line. Of the children at Fifth Ward Elementary, 79% are African American and 71% live near or below the U.S. federal poverty line.[55]

Furthermore, according to the most recent hospital data available, St. John the Baptist Parish is vastly overburdened with childhood asthma. The hospital admission rate for asthma in children (2-17 years) is more than double the Louisiana or U.S. average (289 admissions versus 118 or 117 admissions, respectively, per 100,000 population).[56] This disproportionate burden is also experienced by young adults in St. John, who have nearly double the hospital admission rate for asthma compared to the Louisiana or U.S. average (79 versus 43 or 46 admissions, respectively, per 100,000 population).[57] Yet, corresponding smoking rates are slightly lower than the state average (20% versus 22%).[58] The most obvious explanation for the disproportionate asthma burden residents of St. John face is air pollution exposure. According to the EPA, respiratory hazard from air pollution in St. John is higher than 80% of Louisiana and at least 90% of the U.S.[59] In sum, residents of St. John, and especially children, are overburdened with inescapable toxic air and a high prevalence of serious adverse health effects. During an EPA presentation to St. John residents and environmental activists, one lifelong resident of Reserve remarked, "We're being poisoned. EPA told us that. They said Denka is killing us, and they're not going to stop it. . . . They're sending a mission to Mars [and yet] they can't protect 400 Black children in [St. John] from this monstrous plant."[60]

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https://www.epa.gov/sites/production/files/2016-06/documents/epa-laplace-action-plan.pdf, *citing* La. Dept. Health & Human Services Final Report, "Summary of Existing Environmental Public Health Data East St. John the Baptist Parish Elementary School (Leon Godchaux Site)," (Nov. 13, 2015).

[53] *Id.*

[54] *See* St. John STEM Magnet High School Program, *Maps*, https://stem.stjohn.k12.la.us/apps/maps/ (last accessed May 11, 2021) (showing the location of St. John STEM Magnet High School as 1880 Highway 44, Reserve, La.).

[55] *See School Directory Information: Fifth Ward Elementary School*, National Center for Education Statistics, https://nces.ed.gov/ccd/schoolsearch/school_detail.asp?Search=1&SchoolID=220153002003&ID=220153002003 (last accessed May 11, 2021) (reporting demographic data and eligibility for U.S. federal free lunch program).

[56] Metropolitan Hospital Council of New Orleans, *2015 Community Health Needs Assessment*, at 157, *available at* http://www.stph.org/upload/docs/AboutUs/MHCNO%202015%20Community%20Health%20Needs%20Assessment.pdf.

[57] *Id.* at 150.

[58] 2015 Smoking prevalence among adults, reported in 2017 County Health Rankings. *Available at* https://www.countyhealthrankings.org/app/louisiana/2017/measure/factors/9/data.

[59]U.S. EPA, *EJScreen Report*, *supra* note 23.

[60] Statement made by Robert Taylor on video (embedded in Nick Reimann, *Government Unlikely to Ever Enforce Emission Threshold for St. John Plant, EPA Official Says*, NOLA.com (Feb. 25, 2019, 7:00 PM), https://www.nola.com/news/environment/article_db0b4887-b67c-53e6-8767-339cb0e249fb.html.

iii. The health impacts of chronic chloroprene exposure render people living near Denka/Dupont facility more vulnerable to health threats, including the respiratory illness COVID-19.

Chloroprene exposure also negatively impacts the immune system,[61] leaving those exposed more vulnerable to additional health threats, including the respiratory illness COVID-19. In addition to the pollution disparity, in the past year residents of St. John have also been overburdened with incidences of and deaths from COVID-19. In the United States, as well as Louisiana specifically, African Americans have disproportionately suffered the impacts of COVID-19.[62] As of April 2021, nationwide, 1 in 555 Black Americans, or 179.8 in 100,000, had died since the onset of the pandemic, the second highest mortality rate of any race group behind Indigenous Americans, making COVID-19 the third leading cause of death for black Americans currently.[63] In Louisiana, this number increases to 247.7 in 100,000 Black Americans.[64] This inequality corresponds with industrial pollution, of which African Americans in Louisiana are also disproportionately burdened.[65] In sum, prolonged exposure to chloroprene is directly associated with increased risk of cancer and other serious illnesses and also renders residents of St. John more vulnerable to additional health threats such as COVID-19.

C. U.S. and Louisiana Government Agencies Threaten the Lives of the Beneficiaries by Failing to Establish and Enforce a Health-Protective National Emission or Air Quality Standard for Chloroprene and, further, Inadequately Monitoring Air Quality in Communities Surrounding the Denka Facility.

i. EPA has failed to perform its nondiscretionary duty under the Clean Air Act and neglected to exercise the full extent of its statutory authority to protect the lives and health of the beneficiaries.

EPA has failed to perform its nondiscretionary duties under the Clean Air Act to revise and strengthen the national emission standards that apply to chloroprene and its sources. EPA classifies chloroprene as a Hazardous Air Pollutant (HAP) and is therefore obligated to establish standards for the category of sources that emits chloroprene.[66] Accordingly, in 2011 EPA

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[61] *See* U.S. EPA, *Chloroprene Hazard Summary*, *supra* note 12.
[62] Kimberly Terrell & Wesley James, *Air Pollution and COVID-19: A Double Whammy for African American and Impoverished Communities in Cancer Alley*, at 1 (2020), *available at* https://law.tulane.edu/sites/law.tulane.edu/files/Files/Terrell%20-%20COVID-19%20-%20PM%202.5%20Louisiana%202020-5-14%20WEB%20VERSION.pdf.
[63] APM Research Lab Staff, *The Color of Coronavirus: COVID-19 Deaths By Race and Ethnicity in the U.S.* (last visited Apr. 30, 2021), https://www.apmresearchlab.org/covid/deaths-by-race; *see also* Bradley L. Hardy & Trevon D. Logan, *Racial Economic Inequality Amid the COVID-19 Crisis*, The Hamilton Project, Essay 2020-17 (2020), *available at* https://www.brookings.edu/wp-content/uploads/2020/08/EA_HardyLogan_LO_8.12.pdf.
[64] APM Research Lab Staff, *supra* note 63.
[65] Terrell & James, *supra* note 62, at 5.
[66] 42 U.S.C. §§ 7412(b)(1); (d)(1) (2020).

promulgated regulations for emissions from Neoprene Production under the category of Group I Polymers and Resins.[67] EPA is further obligated under the Clean Air Act to review, and revise as necessary, this standard "no less often than every 8 years."[68] Yet, nearly ten years have passed without review since EPA promulgated the regulations for Group I Polymers and Resins.

EPA also has a statutory duty to ensure that the HAP standards it promulgates to regulate sources emitting probable or possible human carcinogens, such as chloroprene, "provide an ample margin of safety to protect public health" and "reduce lifetime excess cancer risks . . . to less than one in one million."[69] In the case of chloroprene, this means establishing an enforceable national emission or air quality standard such that ambient air does not contain chloroprene at air levels higher than 0.002 $\mu g/m^3$. By failing to perform its duties to review and revise the HAP standard for Neoprene Production and establish an enforceable national standard that ensures ambient chloroprene concentrations in St. John do not exceed 0.002 $\mu g/m^3$, EPA threatens the lives and health of beneficiary residents.

EPA's own Office of the Inspector General recently alerted the agency to the inadequacy of its actions to curb the cancer risk faced by the people living near the Denka/Dupont facility. In a recent report, the Inspector General recommended that EPA conduct a new "Risk and Technology Review" (a necessary step under the Clean Air Act for regulating toxic air emissions) for sources that emit chloroprene – singling out by name the Denka/Dupont facility as the only producer of chloroprene in the United States.[70] According to this report, "Without new RTRs or emission standards, the EPA may not be able to achieve environmental justice to protect the health of overburdened minority and low-income communities."[71]

Furthermore, despite acknowledging the severity of the risk posed by the Denka/DuPont facility's chloroprene emissions, EPA has neglected to exercise the full extent of its statutory authority to protect the beneficiaries. Where air pollution is causing imminent and substantial danger, EPA may exercise emergency powers to protect the public health, welfare, or the environment.[72] EPA could use this authority to set enforceable national standards and compel Denka to cease operations or reduce its emissions to levels that protect the lives and health the beneficiaries. EPA's failure to exercise the full extent of its authority under the Clean Air Act, including its emergency powers, is harmful inaction that violates beneficiary residents' rights to health, life, and personal integrity.

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[67] *See* 40 C.F.R. §§ 63.480-63.507; Final Rule, 76 Fed. Reg. 22,566 (Apr. 21, 2011).
[68] 42 U.S.C. § 7412(d)(6).
[69] *Id.* § 7412(f)(2).
[70] U.S. EPA, *Office of the Inspector General, EPA Should Conduct New Residual Risk and Technology Reviews for Chloroprene and Ethylene Oxide-Emitting Source Categories to Protect Human Health*, p. 6-7 (May 6, 2021), *available* at https://www.epa.gov/sites/production/files/2021-05/documents/_epaoig_20210506-21-p-0129.pdf.
[71] *Id.* at 25.
[72] 42 U.S.C. § 7603 (2020).

ii. EPA has failed to adequately monitor ambient chloroprene levels in the area near the Denka/Dupont facility, instead employing inadequate monitoring technology and weakening State monitoring programs.

EPA has consistently failed to adequately monitor ambient chloroprene levels in St. John, first by using monitoring technology not designed or located to detect unsafe levels of chloroprene and now by also phasing out its community monitoring program. Prior to 2016, EPA itself did not monitor emissions from the Denka/Dupont facility, leaving that to Dupont and, later, to Denka.[73] In 2016, EPA conducted a compliance inspection of the facility and found numerous areas of non-compliance spanning decades of operation, including (but not limited to) the failure, apparently beginning in 1997, to meet the EPA regulatory calculation, monitoring, and reporting requirements for chloroprene and other pollutants.[74]

In 2016, EPA implemented an ambient air monitoring plan for chloroprene.[75] Using EPA Method TO-15 for the sample collection, the agency placed canister monitors at six locations throughout Reserve and LaPlace (see Figure 2), and passively collected air in a canister for 24 consecutive hours, but only once every third day.[76] In 2019, EPA reduced the collection frequency to once every sixth day.[77]

The TO-15 monitoring program revealed average ambient chloroprene concentrations nearly 37 times the EPA's 0.2 $\mu g/m^3$ limit of acceptability, with spikes over 700 times that limit (see Table 1). Furthermore, monitoring revealed recurring spikes in chloroprene concentrations, indicating that ambient chloroprene levels in the community are not consistent from one day to the next.[78] EPA suggested these spikes elevated annual averages,[79] but Concerned Citizens worried that the monitors were missing a significant portion of chloroprene concentration spikes, undervaluing actual exposure.

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[73] *See LaPlace, Louisiana – EPA Response*, U.S. EPA, https://www.epa.gov/la/laplace-louisiana-epa-response (last visited Apr. 20, 2021).

[74] U.S. EPA, Nat'l Enforcement and Investigation Center, *Focused Clean Air Act Compliance Investigation* (NEIC Project No. VP1216, 25-52 (October 2016). A copy of this report (with redactions by Denka) is *available at* https://www.desmogblog.com/wp-content/uploads/files/Web-Final-CBI-Redacted-NEIC-CAA-Compliance-Investigation-Denka-2016.pdf. EPA also noted noncompliance in 10,000 regulated components that were neither identified nor monitored prior to Denka's purchase of the facility. *Id.* at 26.

[75] U.S. EPA, *Ambient Air Sampling/Monitoring Plan for Chloroprene in the Area Near Denka Performance Elastomer Pontchartrain Facility, LaPlace, Louisiana (Formerly the DuPont Neoprene Facility, Pontchartrain Works)* 1-4 (May 2016), *available at* https://www.epa.gov/sites/production/files/2016-07/documents/final_ambient_air_monitoring_plan_for_dpe_laplace_la_may_2016.pdf.

[76] *Id.* at 4.

[77] U.S. EPA, *LaPlace, Louisiana – Air Monitoring*, *available at* https://www.epa.gov/la/laplace-louisiana-air-monitoring-0 (last visited May 6, 2021).

[78] *See* U.S. EPA & LDEQ, *Summary Report: Air Monitoring for Chloroprene Concentrations near the Denka Performance Elastomer LLC (DPE) Facility in LaPlace, Louisiana, May 25, 2016 through July 16, 2020* (2020), *available at* https://www.epa.gov/sites/production/files/2020-09/documents/final_epa_community_ambient_air_monitoring_data_summary_report_9-24-20_with_attachment.pdf

[79] *Id.*

In early 2020, EPA transitioned from the TO-15 monitoring method to use of "SPod" monitoring stations as part of its "Continuous Air Monitoring Program" – a program that, though designed in a way that would not capture all chloroprene emissions, including levels at or below EPA's 0.2 µg/m3 maximum level of acceptability, nevertheless documented in its Initial Phase ambient chloroprene levels as high as 4.684 µg/m^3.[80] In contrast with the TO-15 method which collects air samples on a defined schedule, SPods collect air samples only when triggered by a "plume" of total volatile organic compounds (VOC), which may include chloroprene."[81] Data from 2020 SPods shows frequent spikes in chloroprene concentrations[82] - leaving the affected residents still wondering whether monitors are missing the full picture of the chloroprene in the air around them.

Indeed, a review of the monitoring data shows some of the highest measurements of chloroprene came when the SPods were manually triggered to collect a sample, which EPA did whenever a monitor had not triggered in seven days.[83] That these samples – some over 7,500 times the 0.002 µg/m^3 health protective value[84] – came from monitors that were not being automatically triggered by plumes points to much higher emissions of this highly carcinogenic chemical going unaccounted for by the SPod monitoring. This program appears to be less concerned with monitoring the exposure to concentrations of chloroprene of nearby residents than pinpointing the specific sources of emissions within the Denka/Dupont facility itself.

Additionally, EPA plans to continue its monitoring only until Denka completes a schedule turnaround.[85] Originally, the EPA planned to end its monitoring program in December 2020, but has subsequently extended it by 60 days at least once.[86] Once the EPA Continuous Air Monitoring Program ceases, Denka will be the only monitor operator and has stated it will continue monitoring ambient air quality in the surrounding area through 2021.[87]

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[80] U.S. EPA, *Initial Phase Report: Continuous Air Monitoring for Chloroprene Concentrations near the Denka Performance Elastomer LLC (DPE) Facility in Laplace, Louisiana, March 2020 through August 2020* (2020), *available at* https://www.epa.gov/sites/production/files/2020-10/documents/initial_phase_report_continuous_air_monitoring_101620.pdf.

[81] U.S. EPA, *Quality Assurance Project Plan for SPod Monitoring at the Denka Performance Elastomer Facility in Laplace, Louisiana* 20 (2020), *available at* https://www.epa.gov/sites/production/files/2020-03/documents/spod_monitoring_qapp_final_3-_2020_address_redacted_002.pdf.

[82] *See* U.S. EPA, *Continuous Air Monitoring Summary Results for Chloroprene March 10, 2020 - March 25, 2021* (2021), *available at* https://www.epa.gov/sites/production/files/2021-05/documents/continuous-monitoring-summary-march-10-2020-through_march-25-2021.pdf.

[83] *See id.*

[84] *See e.g., id.* (one sample manually collected on 12/02/2020 at the Chad Baker monitor recorded a chloroprene concentration of 15.239 µg/m^3).

[85] *See* Letter from Ken Brown, Regional Administrator, U.S. EPA Region 6, to Dr. Chuck Carr Brown, Secretary, LDEQ (Dec. 16, 2020) (attached as Appendix IV).

[86] *See id.*

[87] *See Denka Volunteers to Continue Air Quality Monitoring Through 2021*, L'OBSERVATEUR (Sept. 5, 2020, 7:22 AM), https://www.lobservateur.com/2020/09/05/denka-volunteers-to-continue-air-quality-monitoring-through-2021/#puzzle,1741,1615063712346.

The current status of State chloroprene monitoring in St. John is unclear because, as of February 2021, EPA continued to reporting Continuous Air Monitoring Results, but had not communicated any change of plans to the community.[88] In any event, EPA's reliance on unreliable monitoring and its plan to turn over responsibility to the polluter itself illustrate the increasing inadequacy of the State's monitoring program. Accurate, continuous, and transparent monitoring is critical to the protection of people living near Denka/Dupont. Relinquishing monitoring oversight to Denka threatens accurate data collection, particularly in light of EPA findings on DuPont and Denka's years-long failure to meet chloroprene monitoring and related requirements when it had responsibility for them in the past.[89]

iii. LDEQ has failed to protect against chloroprene air pollution, actively disregarding EPA's minimal guidance and allowing Denka to operate under expired permits.

LDEQ has failed to protect the residents of St. John, including the beneficiaries, by imposing ineffectually high pollution controls on chloroprene emissions and the Denka/DuPont facility. First, LDEQ established a Louisiana state chloroprene ambient air standard of 857 $\mu g/m^3$ (more than 4,000 times EPA's limit of acceptability and 400,000 times EPA's health protective level).[90] Notably, it is unclear what LDEQ's basis is for this chloroprene standard, if any, as the agency does not include chloroprene on its only public document describing the reasons for its toxic air pollutant emission standards.[91] Furthermore, in 2017, LDEQ entered into an administrative order on consent (AOC) with Denka that set an emissions reduction goal of 85% compared to the facility's 2014 chloroprene emissions—a level still far exceeding EPA's 0.2 ug/m^3 limit of acceptability.[92] To illustrate the inadequacy of the 85% goal: as of 2019, Denka reported 84.6% emissions reduction from 2014 levels;[93] nonetheless, 46.5% of EPA's air monitoring samples recorded ambient chloroprene levels greater than 0.2 $\mu g/m^3$, with an average level at least five times that (see Table 1). These reductions are wholly insufficient to safeguard community health.

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[88] U.S. EPA, *Continuous Air Monitoring Summary Results for Chloroprene*, March 10, 2020-March 2, 2021 (2021), *available at* https://www.epa.gov/sites/production/files/2021-04/documents/continuous-monitoring-summary-march-10-2020-through_march-02-2021_0.pdf (last visited May 7, 2021)

[89] *See* U.S. EPA, Nat'l Enforcement and Investigation Center, *Focused Clean Air Act Compliance Investigation* (NEIC Project No. VP1216, 25-52 (October 2016). A copy of this report (with redactions by Denka) is *available at* https://www.desmogblog.com/wp-content/uploads/files/Web-Final-CBI-Redacted-NEIC-CAA-Compliance-Investigation-Denka-2016.pdf.

[90] La. Admin. Code tit. 33 § 5112 (2021) (Table 51.2).

[91] *See* "Toxics Air Review List," https://deq.louisiana.gov/resources/category/air-toxics-program, *available on* LDEQ's website https://deq.louisiana.gov/assets/docs/Air/TAPchangeswithreasonsforchange.pdf (last visited May 6, 2021).

[92] LDEQ, Administrative Order on Consent, AE-AOC-17-00011, 2 (Jan. 6, 2017), *available at* https://deq.louisiana.gov/assets/docs/Denka/DENKA_AdministrativeOrderOnConsentAOCJan2017.pdf.

[93] *See Annual Certified Emissions Data 1991-Present*, LDEQ (updated Feb. 8, 2021; last visited Mar. 3, 2021), https://deq.louisiana.gov/assets/docs/Air/EmissionsInventory/ERIC/All_Certified_Emissions.xlsx (reporting that in 2014, DuPont emitted 257,625.39 pounds of chloroprene, and in 2019, Denka emitted 39,596.81 pounds of chloroprene).

Even EPA has acknowledged the ineffectiveness of this AOC, telling St. John residents, "They've made their 85 percent (goal). It's just not sufficient to get to the 0.2 . . . . I don't even want to pretend that's a satisfying answer."[94]

LDEQ further harms the beneficiaries by allowing Denka to operate under expired Clean Air Act operating permits, consequently avoiding protections to the community, such as public comment and judicial review. Denka currently operates under expired permits for its Chloroprene,[95] Neoprene,[96] and HCl Recovery Units,[97] all of which emit chloroprene. Denka submitted applications for permit renewal for all three units,[98] but LDEQ has not issued new permits or even published proposed renewals for public notice and comment.[99] In addition, delaying consideration of permits allows LDEQ to avoid its public trust duty—*i.e.*, its obligation under the Louisiana Constitution, "before granting approval of proposed action affecting the environment, to determine that adverse environmental impacts have been minimized or avoided as much as possible consistently with the public welfare."[100] If LDEQ cannot make that determination, it cannot approve the permit renewal. Here, because the adverse environmental impacts of the Denka/DuPont facility have not been minimized or avoided, LDEQ would have to require greater protection for the community in order to allow the facility to continue operations.

Finally, LDEQ has generally failed to adequately address the needs and concerns of the community. Indeed, at a public meeting in 2016, LDEQ Secretary Chuck Carr Brown dismissed St. John residents' concerns about monitoring spikes as "fear mongering" and told the community to "forget" EPA's recommendation of 0.2 $\mu g/m^3$.[101]

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[94] Nick Reimann, *Government Unlikely to Ever Enforce Emission Threshold for St. John Plan, EPA Official Says*, NOLA.COM (Feb. 25, 2019, 7:00 PM), https://www.nola.com/news/environment/article_db0b4887-b67c-53e6-8767-339cb0e249fb.html

[95] LDEQ, Part 70 Operating Permit No. 3000-V5 (2014) (expired Apr. 26, 2017), LDEQ Electronic Document Management System (EDMS) Doc. ID No. 9456485.

96 LDEQ, Part 70 Operating Permit No. 2249-V9 (2017) (expired May 15, 2019), EDMS Doc. ID No. 10591494.

97 LDEQ, Part 70 Operating Permit No. 206-V4 (2017) (expired Jun. 18, 2020), EDMS Doc. ID No. 10524994.

[98] Title V Permit Renewal/Modification/Reconciliation Application: Chloroprene Unit, St. John the Baptist Parish, AI No. 199310, Title V Permit No. 3000-V5 (Oct. 26, 2016), EDMS Doc. ID No. 10386907; Title V Permit Renewal/Modification/Reconciliation Application: Neoprene Unit, St. John the Baptist Parish, AI No. 199310, Title V Permit No. 2249-V9 (Jul. 26, 2018), EDMS Doc. ID No. 11249049; Title V Permit Renewal/Modification/Reconciliation Application: HCl Recovery Unit, St. John the Baptist Parish, AI No. 199310, Title V Permit No. 206-V4 (Nov. 19, 2019), EDMS Doc. ID No. 11954047.

[99] *See* LDEQ EDMS, https://edms.deq.louisiana.gov/app/doc/querydef.aspx, Agency Interest (AI) No. 199310 (last visited May 8, 2021).

[100] *Save Ourselves, Inc. v. La. Env't Control Comm'n*, 452 So.2d 1152, 1157 (La. 1984).

[101] Stephen Hemelt, *Chloroprene Emissions Concern Many; State Official Addresses 'Fear Mongering,' Cancer Questions*, L'Observateur (Dec. 14, 2016, 12:11 AM), https://www.lobservateur.com/2016/12/14/chloroprene-emissions-concern-man-state-official-addresses-fear-mongering-cancer-questions/#puzzle,1706,1614537570455 ("'Regarding the .2 number, if you could all forget that, you would be better off because there is no standard,' Brown told School Board members.")

In short, by establishing an ineffectually high state ambient air quality standard, setting patently unprotective goals for emissions reductions, and allowing Denka to operate under expired Clean Air Act permits, LDEQ's regulatory failures allow the ongoing threat to the life and health of the beneficiaries.

iv. The Biden administration's executive orders lack the substance and urgency necessary to protect the beneficiaries.

The new U.S. presidential administration acknowledged the ongoing crisis in Cancer Alley in a speech when President Joe Biden unveiled a series of executive orders intended to address environmental issues.[102] However, the language of the pertinent order, the *Executive Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*, does not actually reference "Cancer Alley" by name or address the health threats to residents of St. John.[103] A resident of St. John directly affected by emissions from the Denka/DuPont facility expressed his worries over the government following through with its plans, saying that "the distance between seeing Mr. Biden address our problems directly, and anything actually coming to fruition, is a long gap."[104]

This executive order states a policy "to improve public health and protect our environment … ensure access to clear air and water [and] … limit exposure to dangerous chemicals … [and] hold polluters accountable, including those who disproportionately harm communities of color and low-income communities" by poor air and water quality."[105] However, it does not articulate a specific plan or timeline to relieve these communities of their burden, deal with the petrochemical industry, or bind the state of Louisiana or its agencies to act.[106] Further, the order does not address Denka, chloroprene, or the communities of St. John by name.[107] And while the order states that EPA "should … consider[ ] … proposing new regulations to establish comprehensive standards of performance and emission guidelines for methane and volatile organic compound emissions from existing operations in the oil and gas sector . . . ,"[108], it does not create any obligation for the State to regulate chloroprene, let alone an obligation that did not already exist. In light of EPA's long standing failure to set protective standards under its current

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[102] Tristan Baurick, *Biden Utters the Words 'Cancer Alley,' But Will He Help Louisiana's Chemical Corridor?*, Nola.com (Jan. 28, 2021, 6:06 PM), https://www.nola.com/news/environment/article_0ced9da4-61b1-11eb-af00-fb2987cd8fb2.html.
[103] *See* Exec. Order No. 13990, 86 Fed. Reg. 7037 (Jan. 20, 2021), *also available at* https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-protecting-public-health-and-environment-and-restoring-science-to-tackle-climate-crisis/.
[104] Robert Taylor, *The US Ignored Louisiana's 'Cancer Alley' For Decades. Will Biden Finally Take Action?*, The Guardian (Feb. 1, 2020, 6:00 AM), https://www.theguardian.com/commentisfree/2021/feb/01/us-louisiana-cancer-alley-biden-climate-orders.
[105] Exec. Order 13990 § 1, 86 Fed. Reg. 7037 (Jan. 20, 2021).
[106] *Id.* §§ 2 – 8.
[107] *See id.* §§ 1 – 8.
[108] *Id.* § 2(c)(i).

authority and its failure even to review the chloroprene standard as required by current law,[109] there is no reason to believe that the procedural mechanisms outlined in the order will now protect this particular community at all, let alone in a timeframe that urgency requires. Thus, the order holds little promise for emission reductions from the Denka/DuPont facility or regulation of chloroprene.

D. Beneficiaries and Advocates in St. John Have Used Myriad Domestic Avenues to Obtain Relief but Are Consistently Dismissed by the Pertinent Authorities.

Beneficiaries, individually or as members of the Concerned Citizens, a community group dedicated to ensuring health and safety of its community in the face of polluting industries, have spent nearly a decade fighting for chloroprene emission reductions through grassroots organizing, intercessions with industry and government officials, and various litigation attempts. In 2019, members of the Concerned Citizens helped organize the March Against Death Alley, which saw community members walk nearly 100 miles over two weeks from Reserve to the state Capitol in Baton Rouge, Louisiana.[110] Among the marchers' demands was for the State to "[e]ither curb production at Denka to stay under the EPA-recommended limit for chloroprene emissions or shut [the Denka/DuPont facility] down."[111]

The Concerned Citizens also attempted to confer with Denka's parent company directly. In June 2019, two members of the Concerned Citizens traveled to Tokyo, Japan with the UNHR to confront Denka's officials and shareholders.[112] Denka's parent company denied responsibility for the operations of its U.S. subsidiary and issued a press statement that its subsidiary "has operated the plant in strict compliance with the currently prevailing legal regulations and emission standards."[113] Notably, not only has Denka continued to pollute at dangerous levels with apparent indemnity, but Denka has also spent the last four years petitioning and lobbying for EPA to contradict its own science and increase the limit of acceptability for chloroprene

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[109] *See* U.S. EPA Office of Inspector General, *EPA Should Conduct New Residual Risk and Technology Reviews for Chloropreneand Ethylene Oxide-Emitting Source Categories to Protect Human Health*, Report No. 21-P-0129 (May 6, 2021), *available at* https://www.epa.gov/sites/production/files/2021-05/documents/_epaoig_20210506-21-p-0129.pdf.

[110] *See* Jamiles Lartey & Oliver Laughland, *'They've Been Killing Us For Too Long': Louisiana Residents March in Coalition Against 'Death Alley'*, The Guardian (May 30, 2019, 7:00 PM), https://www.theguardian.com/us-news/2019/may/30/toxic-america-louisiana-residents-march-against-polluting-plant .

[111] *Our Demands*, Coalition Against Death Alley (last visited Mar. 2, 2021), https://www.enddeathalley.org/demands.

[112] *See* U. Network for Hum. Rights., *Louisiana Residents Confront Denka Co. Ltd. at AGM over Toxic Air Emissions* (Jun. 20, 2019), *available at* https://static1.squarespace.com/static/5b3538249d5abb21360e858f/t/5d0f611445897f000103251e/1561288981503/Press+release_denka_english_PDF.pdf.

[113] *See id.*; Denka, Statement Regarding NATA's Toxicity Assessment on the Areas Surrounding Denka's U.S. Subsidiary and Initiatives Being Undertaken to Reduce Environmental Burden, 1 (June 19, 2019), https://www.denka.co.jp/eng/storage/news/pdf/238/20190619_statement_en.pdf.

exposure.[114] In other words, Denka has no intention of reducing chloroprene emissions to health-protective levels until the U.S. government establishes an enforceable emission standard.

Concerned Citizens and its members have also directed efforts at U.S. and Louisiana state government entities. The community has attempted to work closely with Louisiana state agencies in finding a solution, but LDEQ has routinely dismissed concerns about chloroprene, evidenced by the positions taken by its Secretary, Chuck Carr Brown.[115] Members of the Concerned Citizens have also approached their U.S. congressional representatives, to no avail.[116] Most recently, in November 2019, two members of the Concerned Citizens traveled to Washington, D.C. for an arranged meeting with then-Democratic Representative Cedric Richmond (now Senior Advisor to President Biden).[117] The Concerned Citizens members understood from Representative Richmond that he had written letters to Denka, but Denka denies having received any correspondence.[118] Regardless, the meeting did not spark any changes in chloroprene emissions. While in Washington, D.C., the Concerned Citizens members also visited EPA's headquarters and urged the agency to, among other requests, continue State monitoring and compel Denka to reduce emissions such that ambient chloroprene levels in St. John do not exceed, at a maximum, 0.2 $\mu g/m^3$.[119] EPA has not met any of these requests. Indeed, the Concerned Citizens have already paved the road for EPA to receive this Commission's direction by filing a Petition for Emergency Action and Petition for Rulemaking with the agency.[120]

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[114] *See, e.g.*, *Denka Performance Elastomer LLC (DPE) Request for Correction 17002 (chloroprene)* (2018), available at https://www.epa.gov/sites/production/files/2018-08/documents/rfr_final_draft_7-23-2018_n3630830x7a3a0.pdf . (Denka's request for the EPA-derived IUR value to be increased, the cancer classification be downgraded from "likely" to "suggestive," and for upper limit of acceptability of 0.2 $\mu g/m^3$ to be withdrawn); Emily Holden & Oliver Laughland, *Revealed: Denka Lobbied to Undermine Science Behind 'Likely' Cancer-Causing Toxin*, The Guardian (Dec. 19, 2019, 5:00 AM), https://www.theguardian.com/us-news/2019/dec/19/denka-lobbied-likely-cancer-causing-toxin-undermine-science (noting that Denka's consultants testified at a congressional meeting criticizing EPA's chloroprene review).

[115] *See* Hemelt, *supra* note 101 (noting Secretary Brown's accusation that residents of St. John were "fear mongering" and his assertion the community should "forget" about EPA's recommended protective 0.2 $\mu g/m^3$ level).

[116] *See* Oliver Laughland & Emily Holden, *Why Is This Top Democrat Absent from the Fight Against Toxic Pollution in Cancer Alley?*, The Guardian (Dec. 12, 2019, 6:00 AM), https://www.theguardian.com/us-news/2019/dec/12/louisiana-democrat-cedric-richmond-cancer-town.

[117] *Id.*

[118] *Id.*

[119] U. Network for Human Rights, *Concerned Citizens of St. John Parish Meet with EPA in Washington, D.C.*, (Nov. 21, 2019), https://www.humanrightsnetwork.org/press/2019/11/20/concerned-citizens-of-st-john-parish-meet-with-epa-in-washington-dc.

[120] *See* Petition for Emergency Action under the Clean Air Act, 42 U.S.C. § 7603 *et seq.*, to Abate the Imminent and Substantial Danger to St. John the Baptist Parish, Louisiana Residents from Toxic Air Pollution and Petition for Rulemaking under the Clean Air Act, 42 U.S.C. § 7412, to Set Health-Protective Air Toxics Emissions Standards, *available at* https://earthjustice.org/sites/default/files/files/ccsj_petition_for_emergency_action_petition_for_rulemaking_05-06-2021_1.pdf.

Finally, community members have also sought relief through the legal system from Denka, DuPont, LDEQ, and the Louisiana Department of Health, still to no avail.[121] In short, residents of St. John have time and again brought the dire situation in their community to the attention of the pertinent authorities and pled for relief. Despite these efforts, the State has taken little to no action to protect residents while chloroprene emissions remain exorbitantly above EPA's limit of acceptability, and even further above EPA's health-protective value limit.

V. Precautionary Measures Are Necessary to Prevent Irreparable Harm to the Lives and Health of the Beneficiaries from a Serious and Urgent Situation.

The serious and urgent situation in St. John caused by the U.S. and Louisiana government's failure to control chloroprene emissions from the Denka/DuPont facility necessitates that the Commission order precautionary measures for immediate State intervention to prevent further irreparable harm. The Rules of Procedure of the Inter-American Commission on Human Rights provide for precautionary measures in "serious and urgent situations presenting a risk of irreparable harm to persons . . . ."[122] Here, the serious and urgent situation exists because the State is allowing Denka/Dupont to pollute at levels that expose St. John residents to chloroprene concentrations thousands of times higher than EPA's health protective value of 0.002 $\mu g/m^3$ and a hundred times higher than EPA's 0.2 $\mu g/m^3$ limit of acceptability (see Table 1), plainly justifying the imposition of precautionary measures. Despite this matter being brought before the pertinent authorities, the State has failed to protect the beneficiaries their rights to health, life, and personal integrity. Precautionary measures are warranted due to the serious and urgent threat of irreparable harm that toxic pollutants pose to beneficiary residents' life, health, and well-being.

A. Seriousness

The State's failure to control chloroprene emissions in St. John constitutes a serious situation because it gravely impacts St. John residents' rights to health, life, and personal integrity. A "'serious situation' refers to a grave impact that an action or omission can have on a protected right . . . ."[123] Despite now acknowledging the seriousness of the situation in Cancer Alley at the highest level of the U.S. government,[124] the State has failed to act to relieve St. John of its disproportionate, toxic burden, thus gravely impacting the beneficiaries' internationally

[121] *See, e.g.*, *Taylor v. Denka*, 332 F. Supp 3d 1039, 1044, 1046 (E.D. La. 2018) ("seeking, among other things, injunctive relief in the form of abatement of chloroprene releases such that the concentration of chloroprene does not exceed the 0.2 µg/m3 threshold"); *Butler v. Denka Performance Elastomer, LLC*, No. 18-6685, 2020 WL 2747276, at *1 (E.D. La. May 27, 2020) (seeking, among other things, injunctive relief in the form of emissions abatement).
[122] IACHR Rules of Procedure, *supra* note 2, at Tit. II, Ch. II, Art. 25(1).
[123] *Id.* at Art. 25(2)(a).
[124] *See* discussion *supra* subpart IV.C.iv (discussing President Biden's explicit mention of Cancer Alley—though not St. John in particular—for his executive order targeting environmental justice, and why the order is too vague and will take too long to create meaningful change or be an effective solution to the immediate life-threatening risk inflicted on residents of St. John).

recognized rights to health, life, and personal integrity. Specifically, the U.S. government's failure to establish a protective and enforceable national standard for chloroprene and compel a reduction of emissions from the Denka/DuPont facility constitutes an omission that seriously threatens the St. John residents' rights to health, life, and personal integrity.

i. The extent and severity of the risk posed by the high ambient chloroprene levels to the people living near the Denka/Dupont facility constitute a serious situation.

The decades-long chronic exposure to chloroprene at levels far exceeding EPA's limit of acceptability poses a serious threat to the beneficiary residents' rights to health, life, and personal integrity. Chloroprene is an exceptionally toxic chemical with a more carcinogenic impact than other hazardous air pollutants for which EPA has established National Emission Standards such as benzene and vinyl chloride.[125] The Commission has noted that "not only do high levels of exposure to toxic or dangerous substances in themselves represent a threat to the rights to life, personal integrity, and health, but also that the chronic and permanent exposure to low levels of these substances."[126] Here, people living near the Denka/Dupont facility have endured chronic exposure to levels of chloroprene orders of magnitude above the protective levels recommended by the U.S. EPA for more than fifty years. Today, Census Tract 708 has the highest cancer risk from air pollution of all census tracts in the United States and EPA itself attributes 85% of this risk to chloroprene exposure.[127] The chronic exposure to high levels of chloroprene, an immensely toxic and dangerous substance, suffered by beneficiary residents poses a clear threat to their rights to health, life, and personal integrity.

ii. The inadequacy of the State's "positive" actions in conjunction with its negative actions and omissions increases the seriousness of the situation for the people living near the Denka/Dupont facility.

The seriousness of the situation in St. John remains despite any nominal "positive" measures the State has claimed to have taken. Although the Commission recognizes that the seriousness of a situation of risk may be impacted by "the measures that the State is reportedly taking . . . insomuch as to relieve or cure the effects that the contamination could have on the beneficiaries'

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[125] *See* discussion *supra* subpart IV.B.i., fn. 41-42.
[126] *Inhabitants of the areas near the Santiago River regarding Mexico*, Precautionary Measure No. 708-19, Inter-Am. Comm'n H.R., Resolution No. 7/20, ¶ 33 (Feb. 5, 2020) (citing Special Report on the implications of human rights of the ecologically rational managing and elimination of dangerous waste and substances, UN Doc. A/HRC/36/41, July 20, 2017, ¶ 14 ("Although cases of acute poisoning and high levels of intoxication present an unquestionable violation of the right to physical integrity, the right also extends to protection against chronic, low-level exposure to toxic substances.")).
[127] *See* discussion *supra* subpart IV.B.i.

health or in order to eliminate or reduce the sources of risk in their origin,"[128] it has also explained that such a positive action 'may not be enough'[129] and that 'protective measures must be adequate and effective; that is, the measures implemented, by their nature, must face the risk to the point that it ceases.'[130]

In the present case, the State's limited action to address the health emergency directly caused by Denka's chloroprene emissions is nowhere near "enough," particularly given the State's many omissions or failures to end the risk. LDEQ's purported control of the situation in St. John largely hinges on the AOC it issued requiring Denka to reduce its chloroprene emissions by 85% from 2014 levels. However, an 85% emissions reduction target is ineffective to protect the lives and health of the beneficiaries because it still results in community chloroprene concentrations that are on average nearly six times higher, and at times more than 100 times higher, than EPA's 0.2 $\mu g/m^3$ limit of acceptability. Even EPA has acknowledged that the 85% reduction target is insufficient.[131] Similarly, the Louisiana state chloroprene ambient standard established by LDEQ is so incredibly high (more than 4,000 times EPA's limit of acceptability and 400,000 times EPA's health protective level) that it is effectively not a standard at all.

Even discounting the clear inadequacy of these measures, the State's omissions and failures to act within its purview to protect the beneficiaries far outweigh any nominal "positive" actions it may boast. For example, EPA has failed to perform multiple nondiscretionary duties, including reviewing and revising the Hazardous Air Pollutant standard that applies to Neoprene Production sources. Despite classifying chloroprene as a "likely human carcinogen,"[132] EPA has failed to ensure the relevant standard "provide[s] an ample margin of safety to protect public health" as is statutorily required.[133] Furthermore, LDEQ has failed to respond or renew Denka's Clean Air Act operating permits, allowing the Denka/DuPont facility to operate under expired permits for four years.

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[128] *Inhabitants of the areas near the Santiago River regarding Mexico*, Precautionary Measure No. 708-19, Inter-Am. Comm'n H.R., Resolution No. 7/20, ¶ 32 (Feb. 5, 2020) (granting precautionary measures).
[129] *Membros dos Povos Indigenas Yanomami e Ye'kwana em relação ao Brazil* [Members of the Yanomami and Ye'kwana Indigenous Peoples regarding Brazil], Precautionary Measures No. 563-20, Resolution, Inter-Am. Comm'n H.R., Resolution No. 35/20 ¶ 48 (noting "informações fornecidas pelo Estado mostram que certas ações foram tomadas em certas aldeias ... que em si mesmas são positivas, mas podem não ser suficientes" and granting precautionary measures).
[130] *Id.* at ¶ 49 ("Nesse sentido, a Comissão recorda que as medidas de proteção devem ser adequadas e eficazes; isto é, as medidas implementadas, por sua natureza, devem enfrentar o risco a ponto que ele cesse.").
[131] Nick Reimann, *Government Unlikely to Ever Enforce Emission Threshold for St. John Plant, EPA Official Says*, NOLA.com (Feb. 25, 2019, 7:00 PM) ("'They've made their 85 percent (goal). It's just not sufficient to get to the 0.2.' [David Gray, EPA deputy administrator for the region that includes Louisiana] said, 'I don't even want to pretend that's a satisfying answer.'").
[132] U.S. EPA, *Table 1. Prioritized Chronic Dose-Response Values for Screening Risk Assessments* (Jun. 18, 2018), https://www.epa.gov/sites/production/files/2014-05/documents/table1.pdf
[133] 42 U.S.C. § 7412(f)(2).

Finally, EPA has failed to exercise the full extent of its emergency powers under the Clean Air Act to protect the public health and welfare.[134] The beneficiaries' chronic and excessive exposure to toxic air pollution constitutes an imminent and substantial danger under the law, which gives EPA the power to set pollution controls and compel Denka/Dupont to cease operations at least until safe community chloroprene concentrations can be achieved. Yet, EPA has failed to take any action under this authority to protect the lives and health of the beneficiaries.

In short, the State has largely failed to implement the necessary measures to relieve, cure, or sufficiently mitigate the effects of the toxic air conditions in St. John and the nominal "positive" actions it has taken are far from "enough." The current chloroprene levels in St. John gravely impact the beneficiaries' life and health.

B. Urgency

The ongoing environmental contamination in St. John, EPA's plan to terminate State monitoring, and the community's vulnerability to additional health threats establish an urgent and imminent threat to the lives and health of beneficiary residents. An "'urgent situation' refers to risk or threat that is imminent and can materialize, thus requiring immediate preventative or protective action."[135] The State-endorsed and -authorized contamination of St. John's air constitutes an urgent situation due to the health impacts and environmental contamination it has already had and will continue to have. Moreover, the additional threat of the COVID-19 pandemic and EPA's plan to cease State monitoring of community chloroprene concentrations in St. John has increased the urgency of the situation and the need for precautionary measures.

i. The ongoing contamination of St. John's air and the resultant health impacts constitute an urgent situation.

There is an imminent threat to the beneficiaries' rights to health, life, and personal integrity due to Denka's continued chloroprene emissions at levels far exceeding EPA's limit of acceptability. Where inhabitants of the areas near the Santiago River, Mexico's most polluted body of surface water, were suffering adverse health impacts from prolonged exposure to contamination, the Commission noted that the urgency requirement was met "due to the continuous environmental contamination situation, taking into account the available information regarding health issues and deaths over the years, along with the lack of measures regarding adequate medical assistance."[136]

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[134] 42 U.S.C. § 7603.
[135] IACHR Rules of Procedure, *supra* note 2, at Tit. II, Ch. II, Art. 25(2)(b).
[136] *Inhabitants of the areas near the Santiago River regarding Mexico*, Precautionary Measures No. 708-19, Inter-Am. Comm'n H.R., Resolution No. 7/20, ¶ 39 (Feb. 5, 2020) (requesting that Mexico adopt precautionary measures where contamination of the Santiago River was disproportionately threatening the health of populations near the river).

On those two factors, the Commission considered that precautionary measures were urgently required "to prevent the impact on [the beneficiaries'] right to life, personal integrity and health" – even pending proof of the connection between the health issues and the alleged contamination.[137]

Here the ongoing presence of air contamination is well-documented, as are the source of the contamination and the adverse health impacts of the people living nearby Denka/Dupont. As the UNHR peer-reviewed study found that *1)* "cancer prevalence among residents within 2.5 kilometers surveyed is significantly higher than what is considered likely for a U.S. population with the same race, sex, and age makeup," *2)* such "prevalence … is associated with proximity to the Denka facility … [and] *3)* levels of chloroprene linked health symptoms among the survey sample—including among children—are high and also associated with proximity to the Denka facility. [138] Indeed, on "other adverse health outcomes linked to chloroprene exposure," the study found "high proportions of respondents regularly experience cardiac symptoms, difficulty breathing, headaches, eye irritation, respiratory symptoms, skin irritation, and fatigue."[139]

Moreover, given the negative impacts of chloroprene exposure on the human immune system,[140] the State's failure to provide adequate medical assistance is apparent from the disproportionate death rate of the people living in St. John. In April 2020, St. John was reported to have the highest death rate from COVID-19 in the United States.[141] The continuous nature of this environmental contamination, which has negatively impacted beneficiaries' health and poses an imminent threat to their health and lives, constitutes an urgent situation.

ii. EPA violated an internationally-recognized duty when it terminated ambient air quality monitoring in St. John, amplifying the urgency of the situation.

EPA's plan to discontinue community chloroprene monitoring in St. John amplifies the urgency of the situation. Following the United Nations' guidance, the Commission has stated that, "[i]n order to protect human rights threatened [by exposure to toxic substances], States have, among other obligations, the duty to generate, collect, evaluate and update adequate information . . . ."[142]

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[137] *Id.*
[138] Nagra, *et al.*, *supra* note 11, 22.
[139] *Id.* at 23.
[140] *See* U.S. EPA, *Chloroprene Hazard Summary*, *supra* note 12.
[141] Ashley Killough & Ed Lavandara, *This Small Louisiana Parish has the Highest Death Rate per Capita for Coronavirus in the Country*, CNN (Apr. 16, 2020, 1:39 AM), https://www.cnn.com/2020/04/15/us/louisiana-st-john-the-baptist-coronavirus/index.html.
[142] *Id.*, at ¶ 24.

Here, although the State has perfunctorily fulfilled this duty (if only by utilizing inadequate monitoring technology),[143] its incremental weakening its programs and its plan to cease all State monitoring illustrates the urgent need for intervention and precautionary measures. After years of relying on DuPont and Denka's unreliable monitoring (which EPA later faulted in numerous ways), EPA began its own monitoring with a methodology that only collected samples every third day (and eventually every sixth day). This methodology was inadequate because ambient chloroprene levels in St. John are variable and should be continuously monitored to account for spikes.[144]

Then, EPA's purported "fix" implemented SPod monitors that were equally, if not more, inadequate. EPA purported that these SPods would provide "continuous air monitoring." Instead, the SPod monitors, which rely on a triggering event of total VOCs concentrations to capture any sample (as opposed to being keyed to detectable levels of chloroprene), may not trigger when ambient chloroprene levels are high. Indeed, many of the higher ambient chloroprene levels recorded under this EPA monitoring protocol were only captured because the SPods had failed to register a triggering event for more than seven days, so samples were taken manually – revealing ambient levels as much as 75 times higher than EPA's 0.2 $\mu g/m^3$ limit of acceptability and over 7,500 times higher than the health protective value of 0.002 $\mu g/m^3$. In short, among other inadequacies, such monitoring can, at best, only capture levels that constitute a "plume," and, in practice, appeared to regularly fail to capture ambient chloroprene at highly elevated and dangerous levels.

Now, EPA plans to breach its duty under international law by ceasing State monitoring in St. John altogether.[145] By relinquishing oversight of air quality monitoring in St. John, the U.S. government will further remove itself from the serious and urgent situation in St. John, undermining any chance for renewed public engagement or protection. EPA's use of inadequate monitoring technology, incremental weakening of its monitoring programs, and plan to cease State monitoring of chloroprene concentrations in St. John amplifies the urgency of the situation for the beneficiaries and necessitates the imposition of precautionary measures by the Commission.

iii. The beneficiaries' increased vulnerability to health threats, such as COVID-19, as a result of chloroprene exposure constitutes an imminent risk.

Finally, the urgency for the people living near the Denka/Dupont facility is compounded by the increased risk of residents contracting—and dying from—COVID-19 and other illnesses due to their heightened vulnerability as a result of chronic chloroprene exposure. The Commission has

[143] *See* discussion *supra* subpart IV.C.ii.
[144] *Id.*
[145] *Id.*

considered the urgency requirement satisfied where a community is faced with a threat to which it has a particular vulnerability.[146] For example, the COVID-19 pandemic disproportionately impacted certain indigenous peoples in Brazil, constituting an urgent situation for the Yanomami and Ye'kwana Indigenous people who were at increased vulnerability from malnutrition and lack of access to medical care.[147] Similarly, here chronic exposure to chloroprene is an urgent situation that increases vulnerability to COVID-19. In the United States, Black-American communities located near industrial facilities have been disproportionately impacted by the virus throughout the pandemic.[148] In particular, many of the illnesses associated with chloroprene exposure, such as cancer, respiratory illness, diabetes, and kidney diseases, are pre-existing conditions that made the community extremely vulnerable to COVID-19.[149]

The COVID-19 pandemic has demonstrated the dangers that the air pollution in St. John pose beyond the direct health impacts associated with chloroprene exposure. Absent State intervention, continued exposure to chloroprene makes the people living near the Denka/Dupont facility more vulnerable to chronic illness and future health threats, thus amplifying the urgency of the situation. In sum, the ongoing environmental contamination and corresponding health risks, EPA's failure to adequately monitor community chloroprene concentrations, and increased vulnerability to health threats resultant from chloroprene exposure establish an urgent situation.

C. Irreparable harm

Threats to an individual's rights to health, life, and personal integrity innately constitute a situation of irreparable harm. For purposes of precautionary measures, "'irreparable harm' refers to injury to rights which, due to their nature, would not be susceptible to reparation, restoration or adequate compensation."[150] The Commission has found that "the possible impact on the rights to life, personal integrity and health constitute, by their own nature, the maximum situation of irreparable harm."[151] Moreover, the Commission has found the irreparability requirement satisfied where the threat arises from the acts or omissions of the State.[152] Therefore, the

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[146] *See Membros dos Povos Indigenas Yanomami e Ye'kwana em relação ao Brazil* [Members of the Yanomami and Ye'kwana Indigenous Peoples regarding Brazil], Precautionary Measure 563-20, Inter-Am. Comm'n H.R., Resolution No. 35/20 ¶ 52 (Jul. 17, 2020).
[147] *Id*; *see* Flávia Milhorance, *Covid Deaths of Yanomami Children Fuel Fears for Brazil's Indigenous Groups*, The Guardian (Feb. 8, 2021, 5:00 AM), https://www.theguardian.com/global-development/2021/feb/08/covid-deaths-yanomami-children-indigenous.
[148] *See* discussion *supra* subpart IV.D.iii.
[149] *See People with Certain Medical Conditions*, CDC website, https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html (last visited May 6, 2021).
[150] IACHR Rules of Procedure, *supra* note 2, at Tit. II, Ch. II, Art. 25(2)(c).
[151] *Inhabitants of the areas near the Santiago River regarding Mexico*, Precautionary Measure No. 708-19, Inter-Am. Comm'n H.R., Resolution No. 7/20, ¶ 40 (Feb. 5, 2020); .
[152] *Membros dos Povos Indigenas Yanomami e Ye'kwana em relação ao Brazil* [Members of the Yanomami and Ye'kwana Indigenous Peoples regarding Brazil], Precautionary Measures, Inter-Am. Comm'n H.R., Resolution No. 35/20 ¶ 53 (Jul. 17, 2020).

situation in St. John meets the irreparability requirement because EPA's failure to set an enforceable national emission or air quality standard for chloroprene and LDEQ's failure to compel Denka to reduce emissions such that the ambient chloroprene levels in the parish remain below the EPA's 0.2 $\mu g/m^3$ limit of acceptability threatens the beneficiaries' rights to health, life, and personal integrity.

Any threat to an individual's right to health presents a risk of irreparable harm, but this is especially true where the adverse health impacts are as serious and enduring as those associated with chloroprene exposure. The historical and present levels of chloroprene exposure have irreparably harmed—and continue to irreparably harm—the beneficiaries by causing cancer and non-cancer illnesses which have no suitable remedy. Chloroprene exposure has been associated with severe health impacts including cancer, cardiac symptoms, and respiratory difficulties.[153] Studies have shown people living near the Denka/Dupont facility to have high incidences of chloroprene-related illnesses.[154] These impacts are especially acute for children.[155] The hundreds of students currently attending school just three blocks from the Denka/DuPont facility at Fifth Ward Elementary, and the hundreds before them, permanently face an increased risk of developing cancer and other serious illnesses because they are forced to live and play in a toxic environment. There is no adequate reparation, restoration, or compensation for the illnesses related to chloroprene exposure. Thus, by failing to control Denka's chloroprene emissions, the State causes irreparable harm to the individual beneficiaries. In conclusion, the State's actions and omissions have inflicted, and continue to inflict, irreparable harm on the life and health of beneficiary residents requiring the immediate order of precautionary measures.

VI. Conclusion

This Commission should direct precautionary measures because the United States government's failure to protect against dangerous emissions of the toxin chloroprene from the Denka/Dupont facility places nearby residents, including members of Concerned Citizens, the beneficiaries of this request, in a serious and urgent situation that threatens their rights to health, life, and personal integrity. These residents face an extremely high risk of cancer and other chronic illnesses from the Denka/DuPont facility's emissions of chloroprene and the resulting ambient chloroprene air levels far outside EPA's own 0.2 $\mu g/m^3$ limit of acceptability - and even further beyond EPA's recommended ambient air limit of 0.002 $\mu g/m^3$. Despite the patent adverse health effects of chloroprene exposure, the United States refuses to exercise its authority via EPA to regulate the chloroprene emissions from Denka/Dupont or to adequately monitor the unacceptably high levels of chloroprene in the air this community breathes every day. Until the United States takes action, residents of St. John will continue to bear the burdens of hazardous

[153] Nagra, *et al.*, *supra* note 11, at 22.
[154] *See id.* at 22-23.
[155] *See id.* at 23.

air and illness at the discretion of an industry that time and again shows it does not value the lives of those in its community.

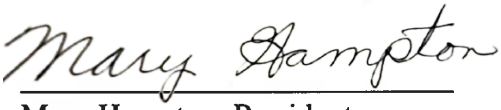
VII. Request for Precautionary Measures

For the foregoing reasons, Petitioners respectfully request that the Inter-American Commission immediately direct that the United States implement precautionary measures to protect the rights of the members of Concerned Citizens of St. John and the other people living near the Denka/Dupont facility from irreparable harm as a result of Denka/Dupont's chloroprene emissions, including:

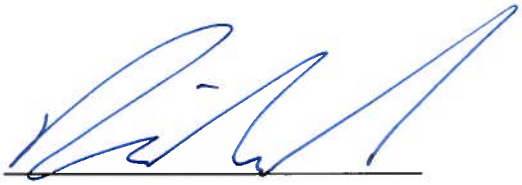
1. Establish a clear, enforceable, and health-protective national emission or air quality standard such that ambient air does not contain chloroprene at air levels higher than 0.002 $\mu g/m^3$;
2. Compel Denka Performance Elastomer LLC to cease operations at its facility in St. John the Baptist Parish until an enforceable chloroprene level is set, or at least reduce its chloroprene emissions such that ambient chloroprene levels in St. John the Baptist Parish do not exceed the EPA's 0.2 $\mu g/m^3$ limit of acceptability in the interim and 0.002 $\mu g/m^3$ permanently;
3. Continue monitoring the ambient chloroprene concentrations in St. John the Baptist Parish with technology that is both continuous and sensitive enough to detect dangerous levels of chloroprene;
4. Relocate Fifth Ward Elementary School away from the Denka Performance Elastomer LLC facility fence line;
5. Provide the residents of St. John the Baptist Parish accurate data on hospitalizations of St. John the Baptist Parish residents due to health effects associated with chloroprene exposure, including asthma and other respiratory disease.
6. Provide the affected residents of St. John the Baptist Parish with medical and/or health services for symptoms associated with chloroprene exposure and free chloroprene testing;
7. Immediately take all actions necessary to guarantee the health and safety of the people living near the Denka/Dupont facility in St. John the Baptist Parish;
8. Any other action this Commission deems appropriate.

Respectfully submitted,

Robert Taylor, Executive Director
Concerned Citizens of St. John



Mary Hampton, President
Concerned Citizens of St. John



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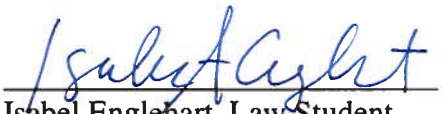

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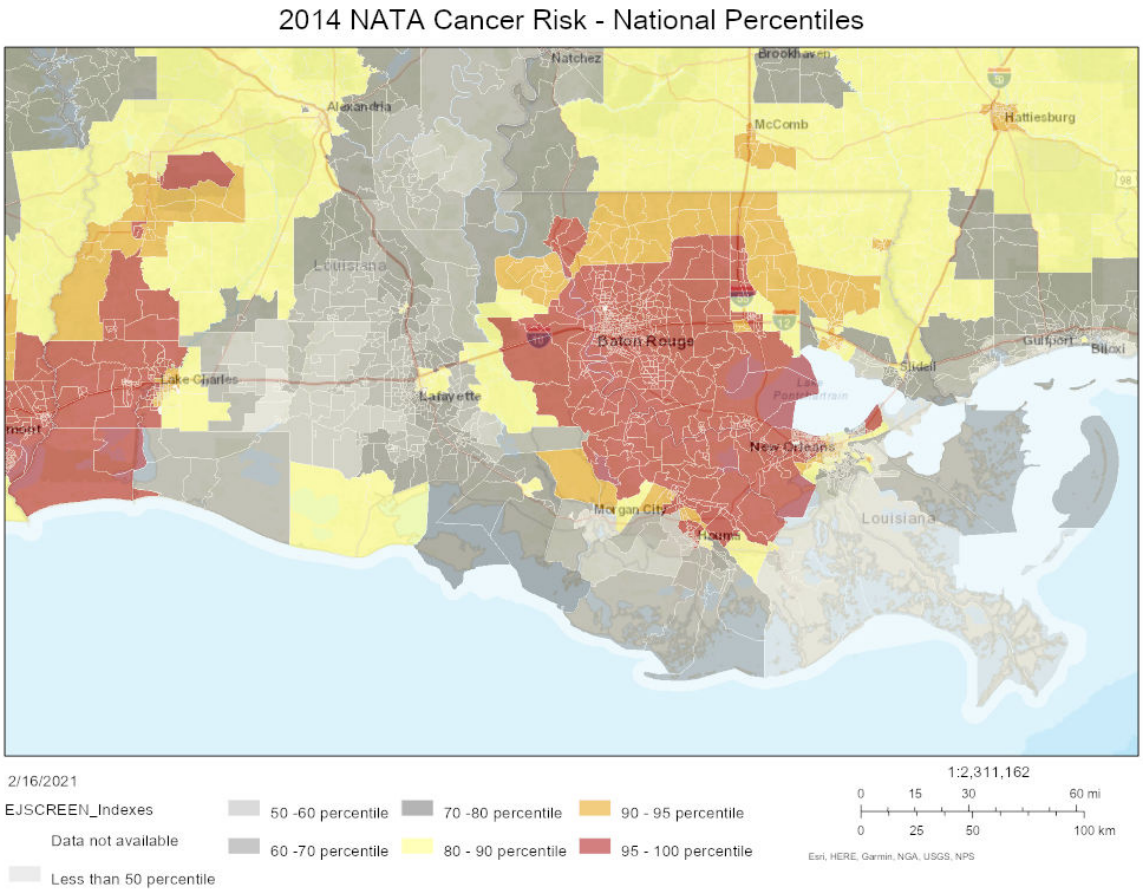
Table 1. Summary Statistics of EPA's Chloroprene Air Monitoring Data[156]

Year	Maximum Concentration Detected ($\mu g/m^3$)	Mean Concentration (Lower Bound) ($\mu g/m^3$)	Mean Concentration (Upper Bound) ($\mu g/m^3$)	Proportion of Samples Greater Than 0.2 $\mu g/m^3$
2016	153.0	7.3289	7.3387	68.6%
2017	151.0	3.7076	3.7190	53.5%
2018	98.7	2.1262	2.1393	47.8%
2019	27.2	1.1558	1.1737	46.5%
2020	22.6	0.7175	0.7349	35.46%

[156] Nagra, *et al*., *supra* note 11, at 20.

Figure 1. Cancer risk attributable to air pollution in south Louisiana, USA, based on the EPA's 2014 National Air Toxics Assessment ("NATA"). Red shading indicates census tracts where the pollution-related cancer risk is higher than 95% of the American population.[157]

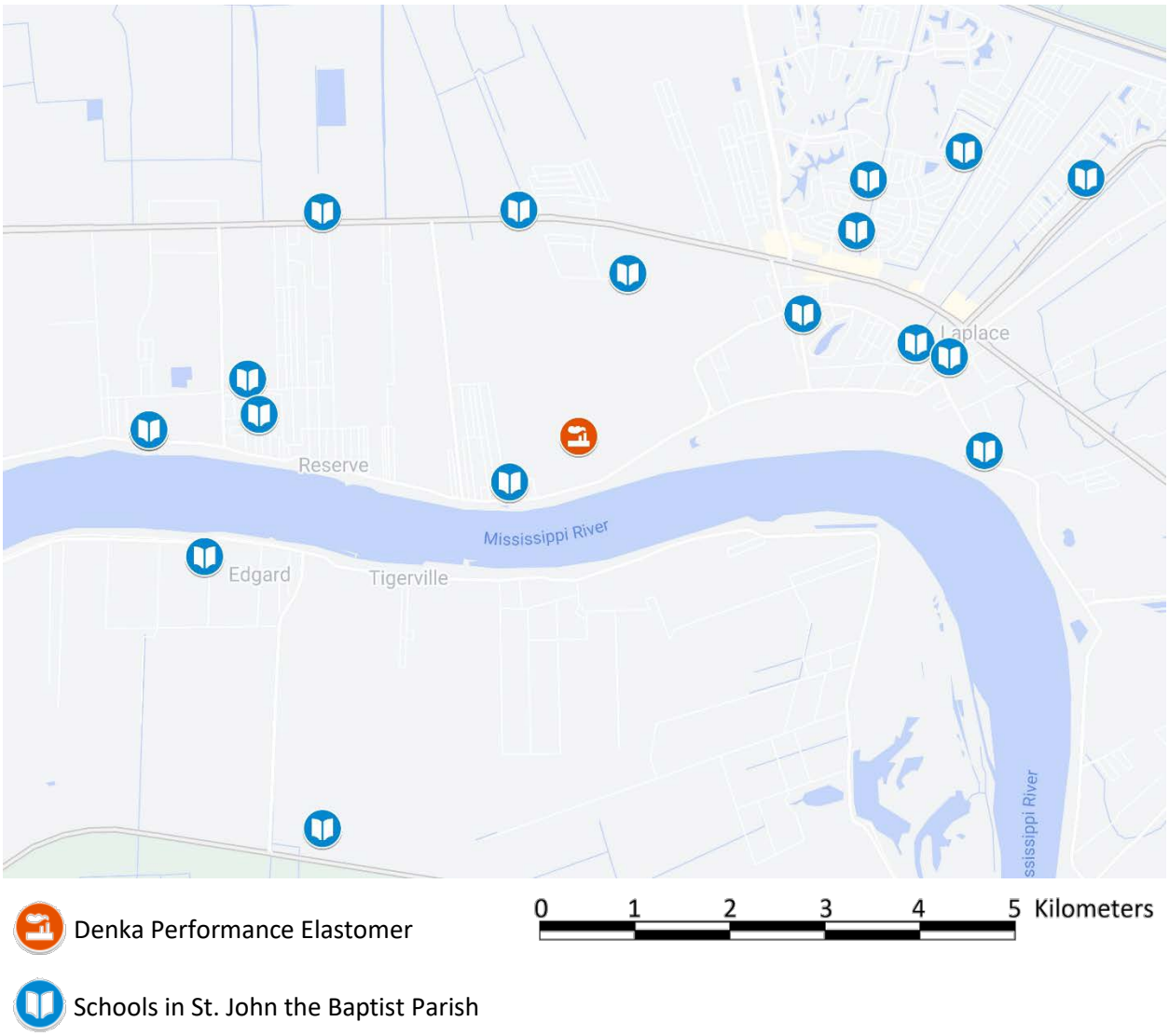


[157] Accessed via EJScreen on Feb. 16, 2021, https://ejscreen.epa.gov/mapper/.

Figure 2. EPA Community Air Monitoring Locations in St. John the Baptist Parish.[158]

[158] U.S. EPA, *Ambient Air Sampling/Monitoring Plan for Chloroprene in the Area Near Denka Performance Elastomer Pontchartrain Facility, LaPlace, Louisiana (Formerly the DuPont Neoprene Facility, Pontchartrain Works)* 2 (2016), https://www.epa.gov/sites/production/files/2016-07/documents/final_ambient_air_monitoring_plan_for_dpe_laplace_la_may_2016.pdf.

Figure 3. Schools Near the Denka/DuPont facility.[159]



[159] LA. Dep't of Health, *A Reference Document for the Preliminary Assessment of Chloroprene Levels in St. John the Baptist Parish: Evaluation of Potential Health Risks for Elementary School Students Based on Early Sampling Results Following Emissions Reductions* 7 (2018), https://ldh.la.gov/assets/oph/Center-EH/DENKA/PreliminaryChloropreneReport.pdf.

U.S. Census Tracts Facing the Highest Air Toxics Cancer Risk[1]

	State	County	Census Tract	Population	Total Cancer Risk (per million)	Total Cancer Risk Attributable to Chloroprene (per million)	Percent of Total Cancer Risk Attributable to Chloroprene
1	LA	St. John the Baptist	708	2,537	1,505.1167	1,279.4944	85.01
2	LA	St. Charles	601	1,937	808.7227	57.1719	7.07
3	LA	St. John the Baptist	709	3,115	616.6193	366.0218	59.36
4	PA	Lehigh	059	1,571	596.4609	0.0002	0.00
5	CO	Jefferson	109	2,310	525.5596	0.0000	0.00
6	LA	St. John the Baptist	707	4,348	511.3240	221.2903	43.28
7	LA	St. John the Baptist	710	2,840	490.2785	134.8894	27.51
8	WV	Kanawha	134	2,222	366.6597	0.0000	0.00
9	LA	St. John the Baptist	711	3,398	363.1912	142.5008	39.24
10	TX	Harris	431	4,629	348.2016	0.0002	0.00
11	PA	Lehigh	001	3,661	346.5181	0.0002	0.00
12	LA	St. John the Baptist	705	6,229	329.2657	127.9095	38.85
13	LA	St. John the Baptist	701	2,685	303.0079	55.4512	18.30
14	LA	St. John the Baptist	703	6,258	296.3112	70.4009	23.76
15	TX	Harris	432	4,944	296.1831	0.0002	0.00
16	LA	St. John the Baptist	704	4,381	286.5417	70.6506	24.66
17	LA	St. Charles	627	4,753	284.5145	35.3076	12.41
18	IL	DuPage	459	3,411	281.8075	0.0002	0.00
19	TX	Jefferson	109	4,592	274.5195	0.0001	0.00
20	PR	Anasco	105	5,979	274.3779	0.0000	0.00
21	LA	St. Charles	625	2,988	273.2695	33.8048	12.37
22	IL	DuPage	458	3,838	263.4419	0.0002	0.00
23	PA	Lehigh	092	3,768	256.0550	0.0002	0.00
24	WV	Kanawha	104	1,700	249.4002	0.0000	0.00
25	WV	Kanawha	001	1,361	248.6375	0.0000	0.00
26	LA	St. John the Baptist	702	7,323	245.4885	46.1575	18.80
27	PA	Lehigh	059	6,436	242.0999	0.0002	0.00
28	TX	Jefferson	108	5,007	237.0866	0.0001	0.00
29	PA	Lehigh	001	4,150	236.0991	0.0002	0.00
30	TX	Jefferson	107	3,393	231.5501	0.0001	0.00

31	TX	Harris	517	3,407	224.4594	0.0002	0.00
32	TX	Harris	433	4,763	223.5143	0.0002	0.00
33	LA	St. John the Baptist	706	2,810	220.6919	37.8491	17.15
34	TX	Jefferson	104	2,993	219.4674	0.0001	0.00
35	NM	Dona Ana	017	5,842	214.5543	0.0001	0.00
36	GA	Newton	003	8,377	214.0706	0.0001	0.00
37	MO	Cape Girardeau	804	6,908	195.9457	0.0000	0.00
38	LA	Iberville	532	7,758	183.3697	0.2948	0.16
39	WV	Kanawha	135	2,953	181.7702	0.0000	0.00
40	CO	Jefferson	111	6,135	177.4738	0.0000	0.00
41	TX	Harrison	206	3,622	166.0596	0.0000	0.00
42	TX	Harris	430	7,423	162.8309	0.0002	0.00
43	PA	Lehigh	057	4,488	159.4492	0.0002	0.00
44	IL	Lake	626	4,367	156.9248	0.0001	0.00
45	TX	Harris	433	4,452	155.5736	0.0002	0.00
46	TX	Jefferson	109	3,538	151.2064	0.0001	0.00
47	PA	Lehigh	093	3,246	150.2199	0.0002	0.00
48	TX	Webb	017	6,486	148.4271	0.0000	0.00
49	PA	Lehigh	096	7,344	147.0287	0.0002	0.00
50	TX	Jefferson	070	3,723	144.4192	0.0001	0.00

[1]Summarizing information from the U.S. EPA's *2014 NATA: Assessment Results*, which provides national cancer risk data by pollutant in spreadsheet at https://www.epa.gov/sites/production/files/2018-08/nata2014v2_national_cancerrisk_by_tract_poll.xlsx).

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"Waiting to Die": Toxic Emissions and Disease Near the Denka Performance Elastomer Neoprene Facility in Louisiana's Cancer Alley

Ruhan Nagra, Robert Taylor, Mary Hampton, and Lance Hilderbrand

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ABSTRACT

Background: Residents of census tract 708 in St. John Parish, Louisiana, face the highest nationwide cancer risk from air pollution due to chloroprene emissions from the Denka Performance Elastomer facility. The University Network for Human Rights worked with residents of this predominantly Black community in Cancer Alley to design and implement a survey-based health study of the area. The study aimed to (1) assess the relationship between household proximity to the facility and reported illness, and (2) advance the advocacy objectives of the community.
Methods: The survey area consisted of households within a 2.5-km radius of the Denka facility. Sixty percent of the households within 1.5 km of the facility (''Zone 1'') and 20% of the households between 1.5 and 2.5 km from the facility (''Zone 2'') were randomly sampled. Survey implementers collected information on cancer diagnoses about all residents of each surveyed household. Information on chloroprene-linked medical symptoms was collected about respondents (those who took the survey) only.
Results: Cancer prevalence among the survey sample is (1) significantly higher than what is considered likely using Monte Carlo simulations based on Surveillance, Epidemiology, and End Results prevalence data ($p = 0.0306$); and (2) associated with proximity to the facility, with significantly higher-than-likely prevalence in Zone 1 ($p = 0.0032$) and lower prevalence in Zone 2. Levels of medical symptoms among respondents are high and also associated with proximity to the facility.
Discussion: Our findings highlight the need for action to compel Denka to reduce chloroprene emissions to Environmental Protection Agency-recommended limits.
Conclusion: Our findings are consistent with Cancer Alley communities' lived experiences of the debilitating health consequences of the area's industrial emissions. The burden of proof must shift to polluting industries.

Keywords: environmental justice, environmental racism, industrial corridor, Cancer Alley, health disparities, community-engaged research

INTRODUCTION

Cancer Alley and the Denka neoprene facility

Louisiana's heavily industrialized corridor between New Orleans and Baton Rouge has long been known as ''Cancer Alley.'' More than 200 chemical plants and refineries are concentrated in this 210-kilometer stretch of land along the Mississippi River, mostly in or near historically Black communities where many residents can trace their lineage to ancestors who were enslaved in the area.[1]

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A preliminary version of this study was posted on the University Network for Human Rights website at: https://drive.google.com/file/d/1Ie93SHF-GrgFfN61PqwXrGh1Ay4lWqMD/view

[1]Trymaine Lee. ''Cancer Alley: Big Industry, Big Problems.'' *MSNBC*. <www.msnbc.com/interactives/geography-of-poverty/se.html>. (Last accessed September 30, 2020).

Since the late 1970s, many Cancer Alley residents have attributed cancer and other illness in their communities to toxic industrial pollution[2] and sought to use regulatory and legal challenges as well as grassroots struggle to compel industry to reduce emissions.[3]

In the past several years, Environmental Protection Agency (EPA) data have bolstered suspicions about the link between air pollution and negative health outcomes in Cancer Alley.[4] According to the most recent EPA National Air Toxics Assessment (NATA), 7 of the 10 U.S. census tracts with the highest cancer risk from air pollution are in Cancer Alley, including the tract with the highest nationwide risk—tract 708 in the town of Reserve in St. John the Baptist Parish.[5]

Nationally, the average estimated risk of developing cancer from air pollution is 32 per million people; in Louisiana's census tract 708, the estimated cancer risk from air pollution is 1505 per million people—47 times the national average.[6] The vast majority of this risk, moreover, is attributed to a single chemical, chloroprene, emitted by the Denka Performance Elastomer neoprene facility. EPA attributes 85% (1279 per million people) of the cancer risk from air pollution in census tract 708 to chloroprene emissions, 12% (187 per million people) to ethylene oxide emissions, and 3% (38 per million people) to all other pollutants.[7] The Denka facility is the only source of chloroprene emissions in St. John Parish[8] and the only producer of chloroprene and neoprene in the United States.[9]

The neoprene facility, owned by DuPont until its sale to Japanese company Denka Performance Elastomer in November 2015, has been pumping chloroprene into the neighboring Black community since 1969.[10] Residents of the community had long felt that there was too much illness in the area—far beyond what could be considered normal.[11] As one resident told us, ''We're just sitting here, waiting to die.''[12]

EPA's Integrated Risk Information System (IRIS) classified chloroprene as a ''likely human carcinogen'' in 2010. Reflecting this new IRIS assessment of chloroprene toxicity, the 2011 NATA (published in December 2015) estimated highly elevated cancer risk from air pollution near the Denka facility. Upon learning about EPA's estimate of their cancer risk in July 2016, residents of Reserve formed a community group called Concerned Citizens of St. John the Baptist Parish (''Concerned Citizens''). Concerned Citizens has demanded a significant reduction in chloroprene emissions from the Denka facility, such that air concentration of the chemical does not exceed 0.2 $\mu g/m^3$—the maximum chloroprene air concentration that would keep cancer risk from air pollution within EPA's ''upper limit of acceptability'' (100 per million people).[13] Concerned Citizens' ongoing struggle for environmental justice has gained increasing traction and national media coverage.[14]

[2]Barbara Allen. ''Cradle of a Revolution? The Industrial Transformation of Louisiana's Lower Mississippi River.'' *Technology and Culture* 47 (2006): 115–116.

[3]Ibid: 116–117. In the Great Louisiana Toxics March of 1989, hundreds of Cancer Alley residents walked from Baton Rouge to New Orleans over a 10-day period. Thirty years later, in 2019, the Coalition Against Death Alley—a coalition of community groups across Cancer Alley and their allies—marched from the town of Reserve to the state capitol in Baton Rouge, demanding environmental justice. Jamiles Lartey and Oliver Laughland. '''They've been killing us for too long': Louisiana residents march in coalition against 'death alley.''' *The Guardian*, 30 May 2019. <https://www.theguardian.com/us-news/2019/may/30/toxic-america-louisiana-residents-march-against-polluting-plant>. (Last accessed February 10, 2021).

[4]EPA's 2011 and 2014 National Air Toxics Assessment (NATA) data showed elevated cancer risks from air pollution in a number of Cancer Alley census tracts. According to the 2014 NATA, for example, of the 109 U.S. census tracts where the probability of developing cancer from air pollution is higher than EPA's upper limit of acceptable risk (100 per million people), 31 are in Cancer Alley. In addition, EPA's Risk-Screening Environmental Indicators model shows very high estimated levels of cancer-causing pollutants in Cancer Alley, according to a recent analysis. Lylla Younes, Al Shaw, and Claire Perlman. ''In a Notoriously Polluted Area of the Country, Massive New Chemical Plants Are Still Moving In.'' *ProPublica*, 30 October 2019. <https://projects.propublica.org/louisiana-toxic-air/>. (Last accessed February 10, 2021).

[5]U.S. Environmental Protection Agency. 2014 National Air Toxics Assessment. August 2018. <https://www.epa.gov/national-air-toxics-assessment/2014-nata-assessment-results#nationwide>. (Last accessed February 10, 2021). We consider Cancer Alley to include the following 11 parishes (i.e., counties) of Louisiana: Ascension, East Baton Rouge, Iberville, Jefferson, Orleans, Plaquemines, St. Bernard, St. Charles, St. James, St. John the Baptist, and West Baton Rouge.

[6]Ibid.

[7]Ibid.

[8]Louisiana Department of Environmental Quality. ''Annual Certified Emissions Data 1991-present.'' April 2020 <https://www.deq.louisiana.gov/page/eric-public-reports>. (Last accessed February 10, 2021).

[9]Jamiles Lartey and Oliver Laughland. ''Cancer and chemicals in Reserve, Louisiana: the science explained.'' *The Guardian*, 6 May 2019. <https://www.theguardian.com/us-news/2019/may/06/cancertown-chemicals-reserve-louisiana-science>. (Last accessed February 10, 2021).

[10]Sharon Lerner. ''The Plant Next Door.'' *The Intercept* (March 2017). <https://theintercept.com/2017/03/24/a-louisiana-town-plagued-by-pollution-shows-why-cuts-to-the-epa-will-be-measured-in-illnesses-and-deaths/>. (Last accessed February 10, 2021).

[11]Ibid.

[12]''Gloria Dumas.'' YouTube video, 2:46, excerpts of interview conducted by University Network for Human Rights, posted by ''University Network for Human Rights.'' 2019. <https://www.youtube.com/watch?time_continue=63&v=F77MvXt6y88&feature=emb_logo>. (Last accessed February 10, 2021).

[13]U.S. Environmental Protection Agency. ''Preliminary Risk-Based Concentration Value for Chloroprene in Ambient Air.'' May 2016. <https://www.epa.gov/sites/production/files/2016-06/documents/memo-prelim-risk-based-concentrations050516.pdf>. (Last accessed February 10, 2021).

[14]Sharon Lerner. ''When Pollution Is a Matter of Life and Death.'' *New York Times*, 22 June 2019. <https://www.nytimes.com/2019/06/22/opinion/sunday/epa-carniogens.html>. (Last accessed February 10, 2021); Jamiles Lartey and Oliver Laughland. '''Almost every household has someone that has died from cancer,''' *The Guardian*, 6 May 2019. <https://www.theguardian.com/us-news/ng-interactive/2019/may/06/cancertown-louisana-reserve-special-report>. (Last accessed February 10, 2021); Rebecca Hersher. ''After Decades of Air Pollution, a Louisiana Town Rebels Against a Chemical Giant.'' *NPR*, 6 March 2018. <https://www.npr.org/sections/health-shots/2018/03/06/583973428/after-decades-of-air-pollution-a-louisiana-town-rebels-against-a-chemical-giant>. (Last accessed February 10, 2021); Victor Blackwell, Wayne Drash, and Christopher Lett. ''Toxic tensions in the heart of 'Cancer Alley''' *CNN*, 20 October 2017. <https://www.cnn.com/2017/10/20/health/louisiana-toxic-town/index.html>. (Last accessed February 10, 2021).

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Table 1. Summary Statistics of Environmental Protection Agency's Chloroprene Air Monitoring Data

Year	*Maximum concentration detected (μg/m³)*	*Mean concentration (lower bound) (μg/m³)*	*Mean concentration (upper bound) (μg/m³)*	*Proportion of samples >0.2 μg/m³ (%)*
2016	153.0	7.3289	7.3387	68.6
2017	151.0	3.7076	3.7190	53.5
2018	98.7	2.1262	2.1393	47.8
2019	27.2	1.1558	1.1737	46.5
2020	22.6	0.7175	0.7349	35.4

In January 2017, Denka signed a voluntary agreement with the Louisiana Department of Environmental Quality to reduce its emissions.[15] Although chloroprene air concentrations have dropped since then, EPA's monitoring data have continued to show concentrations well in excess of 0.2 μg/m^3 in the neighborhoods around the Denka facility: in 2020, 35% of air samples exceeded the 0.2 μg/m^3 threshold and the mean chloroprene air concentration was 0.7 μg/m^3—more than three times the threshold (Table 1).

Although EPA's estimates of air pollution-related cancer risk have been critical in elevating the long-standing concerns of Cancer Alley residents, these risk estimates have not compelled adequate action to protect human health. As discussed further hereunder, although building upon risk estimates with health studies to determine observed levels of negative health outcomes is valuable, such studies should not be necessary to compel action to protect human health. Once EPA has determined that residents of certain areas may face unacceptably high health risks, strong and swift action is not only warranted but obligatory.[16]

Genesis and goals of our community-engaged research project

The University Network for Human Rights (UNHR) is a nonprofit organization that works closely with communities affected by rights abuse to amplify and advance their struggles through community-led interdisciplinary research, documentation, and advocacy. The authors of this study—UNHR researchers and leaders of Concerned Citizens of St. John Parish—first met in fall 2017.[17] Concerned Citizens then convened several joint community meetings with UNHR researchers to discern residents' most pressing concerns and advocacy priorities. Residents discussed at length their anecdotal evidence of abnormally high levels of cancer and other illness in the community. Multiple people reported, for example, that in almost every household on the streets closest to the Denka facility, someone had cancer or had died of cancer. Residents felt that, to have an impact, this anecdotal evidence needed to be supplemented with quantitative data collected through a household health survey of the area near the plant.

After community members identified a survey-based household health study as one of their priorities, UNHR researchers began working closely with Concerned Citizens to develop a community-engaged research plan for implementation of the study. The goals of the study were (1) to determine the overall health status of a large sample of residents living in the area of the Denka facility, (2) to assess the relationship between household proximity to the Denka facility and reported illness, and (3) to advance the advocacy objectives of Concerned Citizens by collecting and analyzing data that might be useful in the group's efforts to compel Denka to adhere to the EPA's 0.2 μg/m^3 guideline for maximum chloroprene air concentration.

The survey instrument focused on chloroprene-linked health outcomes, in particular, because (1) the vast majority of the cancer risk from air pollution near the Denka facility is due to chloroprene emissions, (2) these emissions can be attributed to the Denka facility since it is the only source of chloroprene emissions in St. John Parish, and (3) the study was motivated by community members' concern about their exposure to chloroprene, which EPA had recently brought to their attention after the release of the 2011 NATA.

METHODS

Epidemiologists and statisticians at Stanford University provided input and guidance to ensure use of proper actuarial processes, study design methods, and

[15]Louisiana Department of Environmental Quality. "Administrative Order on Consent." (Jan 2017). <https://www.deq.louisiana.gov/assets/docs/Denka/DENKA_AdministrativeOrderOnConsentAOCJan2017.pdf>. (Last accessed February 10, 2021).

[16]According to the precautionary principle, one of the most significant developments in modern international environmental law, decision makers must take action to protect the environment and public health when there is scientific uncertainty. Principle 15 of the 1992 Rio Declaration on Environment and Development states, for example: "In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation." United Nations General Assembly, "Annex 1: Rio Declaration on Environment and Development." *Report of the United Nations Conference on Environment and Development*. 12 August 1992, <https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_CONF.151_26_Vol.I_Declaration.pdf>. (Last accessed February 10, 2021).

[17]At the time, Ruhan Nagra was a clinical instructor at Stanford Law School's Human Rights Clinic. She transitioned employment to the University Network for Human Rights in fall 2018 and has continued this work in that capacity.

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survey implementation principles and techniques. As a field epidemiology investigation, the study was (1) initiated in response to what community members described as a public health crisis in the area near the Denka facility, and (2) conducted in the field, through survey-based collection of residents' health information.[18] Stanford University's Research Compliance Office has determined that no IRB review would have been required ''[b]ecause the goal of this project was advocacy for a specific issue in a specific situation and not generalizable research.''

Survey instrument

To guide the development of our survey instrument (Appendix A1), we used peer-reviewed studies based on similar household health surveys.[19] The survey instrument was designed to collect certain health and other information—including age, sex, part- or full-time residency status, cancer and other medical diagnoses, and child health—about all residents of a household. Additional information was collected about respondents (those who took the survey) only, including race/ethnicity and medical symptoms.

Many symptoms and diagnoses were included in the survey instrument because of their link to chloroprene exposure, according to EPA's *Toxicological Review of Chloroprene*. Other symptoms and diagnoses were included after community members identified them as particular sources of concern in focus group sessions held in February 2018.

In addition to cancer diagnoses, the following chloroprene-linked health symptoms were included in the survey instrument: headache, dizziness, fatigue, shortness of breath, rapid heart rate, heart palpitations, chest pain, and irritation of the eyes, nose, throat, and skin.[20] In light of community members' particular concern about health impacts on children as well as evidence suggesting that children are more susceptible than adults to the toxic effects of chloroprene exposure,[21] we also collected survey data on two specific symptoms in children: headaches and nosebleeds. Community members cited both of these symptoms as common in children who live and/or attend school in the area near the Denka facility. (In addition, as noted, headaches are linked to chloroprene exposure.)

Finally, the survey instrument included questions on the frequency and strength of chemical odors in the area as well as residents' level of concern about pollution in their community.

A draft survey instrument was piloted with five residents of the area in February 2018 and modified accordingly for clarity and efficiency of data collection.

Study design

The geographic scope of the study was the area within a 2.5-km radius of the Denka facility. In Figure 1, the outer circle circumscribes the entire survey area and the inner circle circumscribes the area within 1.5 km of the facility. The facility—with a red dot at its center—can be seen at the center of the survey area. In the map on the right, gray dots represent households. Residents of the orange-colored census tract (708) face the nation's highest cancer risk from air pollution, according to EPA. Residents of the yellow-colored census tract (709) face the third-highest nationwide risk.

We ultimately surveyed 60% of households (267 out of 445) within the 1.5-km radius of the plant (''Zone 1,'' as shown in Fig. 1) and 20% of households (271 out of 1376) located between 1.5 and 2.5 km from the plant (''Zone 2''). Households were randomly sampled. After obtaining addresses by census block online, we used a census batch geocoder to geocode the addresses. We determined that there are 445 total households in Zone 1 and 1376 total households in Zone 2, according to 2010 census information. We designed our protocol to ensure that we would randomly survey at least 250 households in Zone 1 (56% of the Zone 1 total) and at least 250 households in Zone 2 (18% of the Zone 2 total). Assuming a survey response rate of $\sim$50%, we used the R random number generator to generate a randomly ordered list of all 445 households in Zone 1 (predicting that we would need to attempt to survey all 445 households to achieve our target number of 250 surveys in Zone 1). We also used the R random number generator to randomly select (and randomly order) 500 addresses in Zone 2 (predicting that we would need to attempt to survey at least 500 households to achieve our target number of 250 surveys in Zone 2). Once we had attempted to survey all 500 households on our Zone 2 list at least twice without reaching the target number of surveys (250), we generated a randomly ordered list of all remaining households in Zone 2. To reach our target number of surveys for each zone, we attempted to survey almost every household in Zone 2 and every household in Zone 1. Thus, the survey response rate is equivalent to the percentage of households ultimately surveyed in each zone.

Study protocol

One day before the start of survey implementation, a team of community members and UNHR researchers distributed flyers throughout the survey area. The flyers informed residents about the upcoming health survey, its goals, and the possibility that their household might be randomly selected for participation. The flyers also stated that residents' participation in the survey was entirely voluntary.

[18]Richard A. Goodman, James W. Buehler, and Michael Gregg. ''Field epidemiology defined.'' *Field Epidemiology* (2008): 3–15. doi: 10.1093/acprof:oso/9780195313802.001.0001.

[19]Peter M. Rabinowitz, Ilya B. Slizovskiy, Vanessa Lamers, Sally J. Trufan, Theodore R. Holford, James D. Dziura, Peter N. Peduzzi, Michael J. Kane, John S. Reif, Theresa R. Weiss, and Meredith H. Stowe. ''Proximity to Natural Gas Wells and Reported Health Status: Results of a Household Survey in Washington County, Pennsylvania.'' *Environmental Health Perspectives* 123 (2015): 21–26.

[20]U.S. Environmental Protection Agency. ''Toxicological Review of Chloroprene.'' September 2010. <https://www.epa.gov/sites/production/files/2016-10/documents/chloroprene.pdf>. (Last accessed February 10, 2021). These conditions can affect people both short- and long-term following exposure to chloroprene.

[21]Ibid.

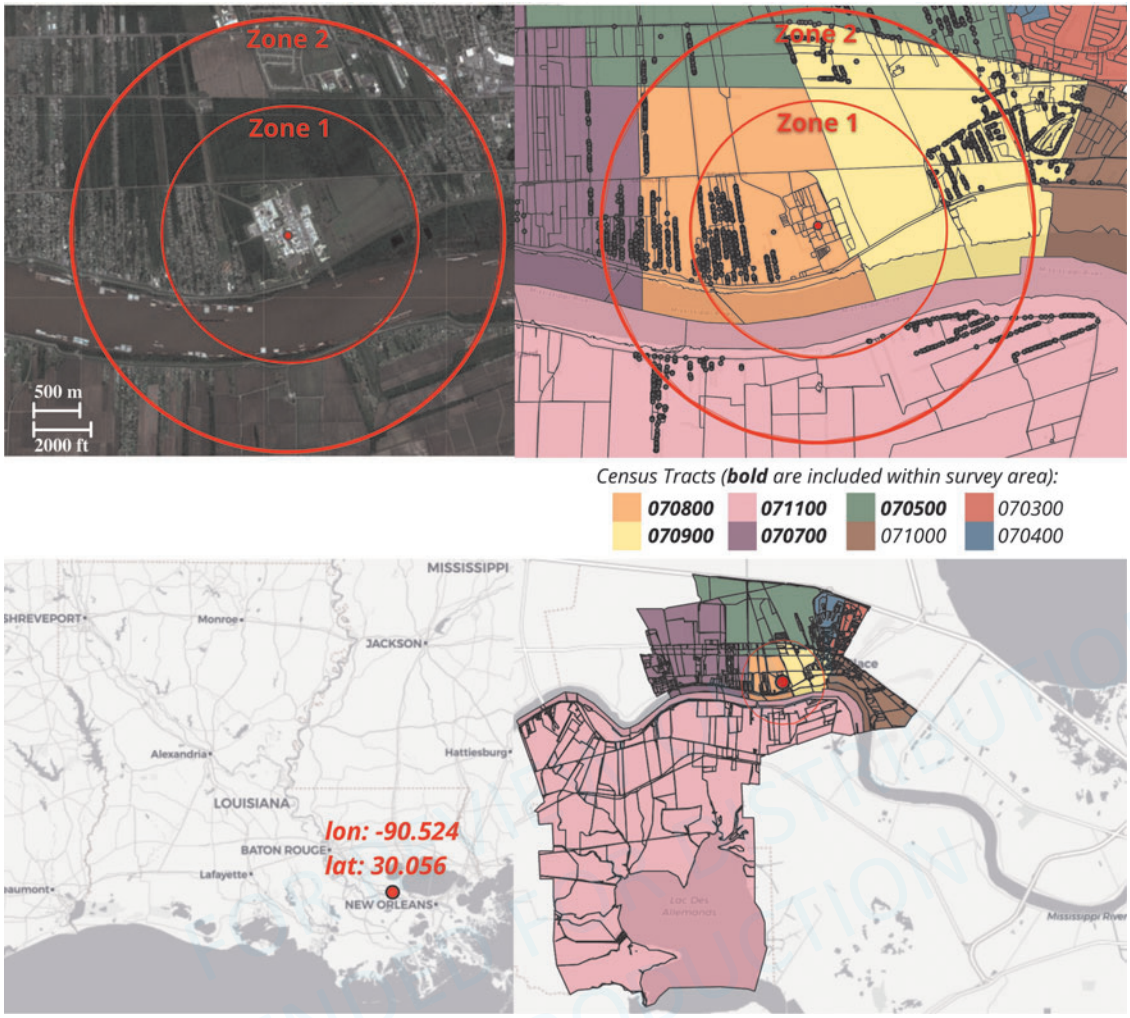

FIG. 1. Maps of survey area.

After undergoing intensive training and practice in survey implementation principles and techniques under the supervision of Stanford University experts, a team of 14 Stanford undergraduates implemented the survey over 9 days (March 22–30, 2018). The survey area was divided into seven geographic subareas for ease of survey implementation (i.e., so that survey implementers could be assigned to a subarea for a given period of time rather than having to walk long distances from household to household across the entire survey area). Survey implementers almost always worked in pairs. Each day, each pair of survey implementers was assigned to one of the seven geographic subareas and provided with a list of households in their subarea. The list was randomized, but to reduce time spent walking between households, the route efficiency was optimized for each set of 20 addresses. Survey implementers attempted to survey each of the 20 route-optimized households twice before moving on to the next set of 20. The following day, survey implementers made a third attempt to survey households that had been attempted twice the previous day, before moving on to the next set of households. Survey implementers generally did not visit a household more than three times. If a household member declined to participate in the survey, implementers did not attempt to survey that household again. Households were surveyed from ~9 am to 7 pm each day.

For each household surveyed, one household member (the ''respondent'') provided health and demographic information about themself and every other person living in the household. We use the term ''residents'' to refer to everyone for whom data were collected (i.e., respondents plus all other household members).

Survey implementers obtained verbal informed consent from each respondent before proceeding. Upon encountering a potential respondent, survey implementers introduced themselves and conveyed the purpose of the survey. They explained that participation in the survey was voluntary; that, if the potential respondent chose to participate, neither their name nor the names of any of their household members would be recorded; that any information provided would remain strictly confidential and would not be shared outside our research team; and that the overall results of the study would be made public but no one's identity or identifying health information

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would be disclosed. If the respondent verbally consented to participate in the survey, one of the survey implementers asked the survey questions, while the other recorded the respondent's answers on a paper survey.

After completion of survey implementation, the data from each survey were manually entered into an electronic REDCap instrument.

Data analysis

Monte Carlo analyses of cancer prevalence. We used Monte Carlo simulations in RStudio to analyze our data on cancer prevalence among residents surveyed. We simulated a population in the United States with the same race, sex, and age demographics as the survey sample. Using 10,000 simulations, we generated probability distributions of cancer prevalence in the simulated population based on the National Cancer Institute's 2015 Surveillance, Epidemiology, and End Results (SEER) data for 23-year cancer prevalence (see Appendix A2 for code abstract).[22] ''Simulated'' cancer prevalence refers to the probability distribution of outcomes generated by these 10,000 simulations. We then compared 23-year cancer prevalence in the survey sample (''observed'' cancer prevalence) with the 23-year cancer prevalence values that are likely—based on SEER data broken down by race, sex, and age—in a demographically similar U.S. population (see Appendix Table A1 for the race/sex/age breakdown of the survey sample with corresponding SEER prevalence data for each demographic). We determined the probability (p-value) that a simulated population with the same race, sex, and age makeup as the survey sample would have a cancer prevalence as high or higher than that observed in the survey sample. We considered results significant when $p < 0.05$.[23]

For every resident in the survey sample, we had a corresponding resident—of the same race, sex, and age—in the simulated population. Each member of the simulated population was assigned a value of 0 (no cancer diagnosis in the previous 23 years) or 1 (one or more cancer diagnoses in the previous 23 years). The probability that a simulated resident in a certain race/sex/age group would be assigned 0 or 1 was based on SEER data. For example, according to SEER data, 23-year cancer prevalence among Black men between the ages of 60 and 69 years is about 12.8%. In the simulated population, every Black male in his 60s was randomly assigned a value of 1 with probability $p = 12.8\%$ (otherwise, a value of 0 with probability $1 - p = 87.2\%$). Each simulated resident was assigned a value of 0 or 1 in this manner, using the SEER cancer prevalence data for that resident's race/sex/age group. The process was then repeated 9999 times to generate a total of 10,000 simulations. This enabled us to compare the observed cancer prevalence outcome in the survey sample to a distribution of cancer prevalence outcomes in the simulated population. Race, sex, and age were considered in our Monte Carlo analyses because SEER data are broken down by these three demographic variables. Other demographic variables (such as socioeconomic status) could not be considered because we lacked comparable national cancer prevalence data for other variables.

We ran Monte Carlo simulations for cancer prevalence in the overall survey area as well as by spatial zone. After separately determining cancer prevalence probabilities closer to the Denka facility (in Zone 1) and farther away from the facility (in Zone 2), we were able to determine whether or not there is an association between cancer prevalence among the survey sample and proximity to the Denka plant.

We ran Monte Carlo simulations both with and without a smoking exclusion criterion. This exclusion criterion removed all residents who live in households where anyone smokes on a daily basis. Since corresponding residents were also removed from the simulated population, the smoking exclusion criterion impacted the range of simulated outcomes as well as the survey outcome.

Age-adjusted cancer prevalence by spatial zone. In addition to Monte Carlo analyses, crude survey data on cancer prevalence in each zone were age-adjusted to the U.S. Standard Population in the year 2000 so that the survey data by zone could be directly compared with SEER's national cancer prevalence (which is also age-adjusted to the 2000 U.S. Standard Population). Survey data were age-adjusted both with and without a smoking exclusion criterion.

Health symptoms and pollution data. We did not use Monte Carlo simulations for health symptoms and pollution data because we lacked comparable national data by demographic group. Survey data on the following symptoms and pollution questions are presented by spatial zone: (1) headaches and nosebleeds in children; (2) chest pain and heart palpitations; (3) wheezing and difficulty breathing; (4) headaches, dizziness, and lightheadedness; (5) eye pain/irritation and watery eyes; (6) cough, sneezing, and sore/hoarse throat; (7) skin rash/irritation and itchy skin; (8) fatigue/lethargy; (9) chemical odors; and (10) concern about pollution.

RESULTS

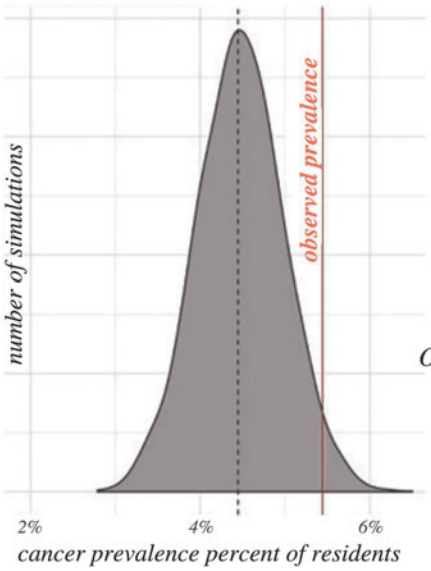
Analysis of EPA's chloroprene air monitoring data

Since 2016, EPA has collected chloroprene air concentration data from six monitoring sites surrounding the Denka facility.[24] Using these data, we calculated annual

[22] A.M. Noone, N. Howlader, M. Krapcho, D. Miller, A. Brest, M. Yu, J. Ruhl, Z. Tatalovich, A. Mariotto, D.R. Lewis, H.S. Chen, E.J. Feuer, and K.A. Cronin (eds). *SEER Cancer Statistics Review, 1975–2015*. (National Cancer Institute, 2018). <https://seer.cancer.gov/archive/csr/1975_2015/results_merged/sect_02_all_sites.pdf>. (Last accessed February 10, 2021).

[23] A lower p-value indicates a smaller probability that the observed difference is due to chance; in other words, the lower the p-value, the more likely that the observed difference is a true difference.

[24] U.S. Environmental Protection Agency. ''DENKA Air Monitoring Summary Sheet.'' September 2020. <https://www.epa.gov/sites/production/files/2020-10/documents/r6_summary_through_september_26_2020.pdf>. (Last accessed February 10, 2021).



Simulated Cancer Prevalence

Statistic	Value
Minimum	2.8%
1st Quartile	4.1%
Median	4.4%
3rd Quartile	4.8%
Maximum	6.5%

Observed cancer prevalence: **5.4%**
p-value: **0.0343**

FIG. 2. Simulated and observed 23-year cancer prevalence.

mean concentrations in two different ways (Table 1): in our ''lower bound'' method, we replaced entries listed as ''ND'' (concentration not detected) with values of 0 μg/m^3 and kept all values below the method detection limit (0.0417 μg/m^3) as they are. In our ''upper bound'' method, we substituted 0.0417 μg/m^3 for each ''ND'' entry and for each value below 0.0417 μg/m^3.

In 2020, the maximum chloroprene air concentration detected was 22.6 μg/m^3, 113 times the 0.2 μg/m^3 threshold. The lower and upper bound mean concentrations that year—0.7175 and 0.7349 μg/m^3, respectively—were both more than three times the threshold. 35.4% of air samples collected in 2020 had a chloroprene concentration that exceeded 0.2 μg/m^3.

Analyses of cancer prevalence

Of the 1640 total residents in the survey sample, eliminations from the data set were made as follows for the analyses of cancer prevalence: 98 part-time residents (defined as those who live in the household for only 1–5 days of the week, inclusive) were eliminated from the data set. Eight residents for whom we did not have all three pieces of necessary demographic information—race, sex, and age—were eliminated from the data set. Twenty-one residents who reported a race/ethnicity for which there is no SEER analogue (and, therefore, no comparable national cancer prevalence statistic) were eliminated from the data set. Finally, since we used SEER's 23-year cancer prevalence statistics, we eliminated the six residents whose only cancer diagnosis happened in 1994 or earlier (>23 years before the health survey).

After all eliminations, the numbers of residents included in the cancer prevalence analyses were 777 in Zone 1 (from 262 households) and 730 in Zone 2 (from 263 households), for a total of 1507 (from 525 households).

Although race information was collected for respondents only, we assumed—for purposes of the cancer prevalence analyses only—that all residents of a household shared the race of the respondent. If a particular respondent was eliminated from the data set (due to one of the aforementioned elimination criteria), all members of the respondent's household were eliminated from the data set as well (since the other household members' race depended on the respondent's race).

Monte Carlo analyses of cancer prevalence across survey area. In a probability distribution of 10,000 simulations, the median value for 23-year cancer prevalence in a population with the same race, sex, and age demographics as the survey sample was 4.4% (Fig. 2). In other words, half of the simulations yielded cancer prevalence values <4.4% and half of the simulations yielded cancer prevalence values >4.4%. The median is, therefore, an approximation of the cancer prevalence outcome that is most likely in a simulated population with the same demographic makeup as the survey sample.[25] In Figure 2, the median is represented by the dotted vertical line in the distribution.

The percentage of survey residents who reported at least one cancer diagnosis in the previous 23 years (''observed cancer prevalence'') was 5.4%, significantly higher than indicated by Monte Carlo simulations based on SEER prevalence data ($p = 0.0343$) (Fig. 2). This p-value indicates the probability that a simulated population with the same demographic makeup as the survey sample would have a cancer prevalence greater than or equal to that of the survey sample. In Figure 2, the survey sample cancer prevalence is represented by the solid red

[25]The table in Figure 2 also provides: (1) minimum, that is, the lowest cancer prevalence value in the probability distribution; (2) first quartile, that is, the cancer prevalence value at which 25% of the simulations yielded lower values and 75% of the simulations yielded higher values; (3) third quartile, that is, the cancer prevalence value at which 75% of the simulations yielded lower values and 25% of the simulations yielded higher values; (4) maximum, that is, the highest cancer prevalence value in the probability distribution.

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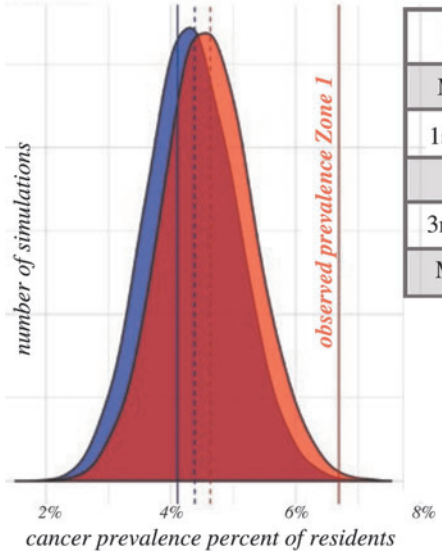

Simulated Cancer Prevalence

Statistic	Zone 1 value	Zone 2 value
Minimum	2.2%	1.5%
1st Quartile	4.1%	3.8%
Median	4.6%	4.4%
3rd Quartile	5.1%	4.8%
Maximum	7.3%	7.5%

Observed cancer prevalence:
Zone 1: **6.7%**; Zone 2: **4.1%**
p-value:
Zone 1: **0.0033**; Zone 2: **0.6527**

FIG. 3. Simulated and observed 23-year cancer prevalence by zone.

vertical line in the distribution. The greater the distance between the solid red line (survey sample cancer prevalence) and the dotted line (approximation of most likely cancer prevalence), the more unusual the cancer prevalence in the survey sample.

When the smoking exclusion criterion was applied, the median value for cancer prevalence in the probability distribution for the simulated population was 4.5% (Appendix Fig. A1). The percentage of survey residents who reported a cancer diagnosis in the previous 23 years was 5.4%, significantly higher than indicated by Monte Carlo simulations based on SEER prevalence data ($p = 0.0306$) (Appendix Fig. A1).

Monte Carlo analyses of cancer prevalence by spatial zone. In probability distributions of 10,000 simulations by spatial zone, the median value for cancer prevalence in Zone 1 was 4.6% and the median value for cancer prevalence in Zone 2 was 4.4% (Fig. 3). In other words, in Zone 1 half of the simulations yielded cancer prevalence values <4.6% and half of the simulations yielded cancer prevalence values >4.6%, and in Zone 2 half of the simulations yielded cancer prevalence values <4.4% and half of the simulations yielded cancer prevalence values >4.4%. The median is, therefore, an approximation of the cancer prevalence outcome that is most likely in a simulated population with the same demographic makeup as the survey sample for each zone.[26] In Figure 3, the red distribution shows the range of cancer prevalence values likely for a simulated population with the same demographic makeup as the Zone 1 survey sample, and the blue distribution shows the range of cancer prevalence values likely for a simulated population with the same demographic makeup as the Zone 2 survey sample. Because there is not a significant difference in the range of simulated cancer prevalence outcomes for Zone 1 and Zone 2, the two distributions overlap significantly. The median for Zone 1 is represented by the dotted red vertical line, and the median for Zone 2 is represented by the dotted blue vertical line.

The percentage of survey residents in Zone 1 who reported a cancer diagnosis was 6.7%, significantly higher than indicated by Monte Carlo simulations based on SEER prevalence data ($p = 0.0033$) (Fig. 3). This p-value indicates the probability that a simulated population with the same demographic makeup as the Zone 1 survey sample would have a cancer prevalence greater than or equal to that of the survey sample. The percentage of survey residents in Zone 2 who reported a cancer diagnosis was 4.1% (Fig. 3). In Figure 3, Zone 1 cancer prevalence is represented by the solid red vertical line, and Zone 2 cancer prevalence is represented by the solid blue vertical line. The greater the distance between the solid line (survey sample cancer prevalence for zone) and dotted line of corresponding color (approximation of most likely cancer prevalence for zone), the more unusual the survey sample cancer prevalence for that zone.

When the smoking exclusion criterion was applied, the median value for cancer prevalence in the Zone 1 probability distribution was 4.6% and the percentage of Zone 1 survey residents who reported a cancer diagnosis was 7.0%, significantly higher than indicated by Monte Carlo simulations based on SEER prevalence data ($p = 0.0032$) (Appendix Fig. A1). The median value in the Zone 2 probability distribution was 4.5% and the percentage of Zone 2 survey residents who reported a cancer diagnosis was 4.3% (Appendix Fig. A1).

[26]The table in Figure 3 also provides: (1) minimum, that is, the lowest cancer prevalence value in each probability distribution; (2) first quartile, that is, the cancer prevalence value for each distribution at which 25% of the simulations yielded lower values and 75% of the simulations yielded higher values; (3) third quartile, that is, the cancer prevalence value for each distribution at which 75% of the simulations yielded lower values and 25% of the simulations yielded higher values; and (4) maximum, that is, the highest cancer prevalence value in each probability distribution.

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Age-adjusted cancer prevalence by spatial zone. Age-adjusted cancer prevalence among residents surveyed in Zone 1 was 5.0139%, 44% higher than SEER's age-adjusted national cancer prevalence of 3.4851%. When the smoking exclusion criterion was applied, age-adjusted Zone 1 prevalence was 5.1421%, 48% higher than the national prevalence of 3.4851%. Age-adjusted cancer prevalence among residents surveyed in Zone 2 was 3.5308%. When the smoking exclusion criterion was applied, age-adjusted Zone 2 prevalence was 3.5112%.

Race/ethnicity, health symptoms, and pollution data

The race/ethnicity, health symptoms, and pollution data presented hereunder were collected for survey respondents only, with the exception of data pertaining to children in the household. After part-time respondents were eliminated from the data set, the sample size for race/ethnicity, symptoms, and pollution data was 263 in Zone 1 and 259 in Zone 2 (a total of 522). Data on headaches and nosebleeds in children were collected from survey respondents, who were asked about the health of any children in their households. After part-time children were eliminated from the data set, the sample size for child health data was 186 in Zone 1 and 220 in Zone 2 (a total of 406).

Race/ethnicity data. The overwhelming majority of respondents in the survey area (80.7%) identified as Black. 15.7% of respondents identified as white, and 3.6% identified as another race/ethnicity or did not provide race/ethnicity information. Black respondents were not distributed evenly throughout the survey area. In Zone 1, a higher proportion of respondents identified as Black than in Zone 2 (93.2% vs. 68.0%). Conversely, 4.9% of Zone 1 respondents and 26.6% of Zone 2 respondents identified as white. 1.9% of Zone 1 respondents and 5.4% of Zone 2 respondents identified as another race/ethnicity or did not provide race/ethnicity information.

Health symptoms data. More than 40% of children in households surveyed in Zone 1 (40.3%) reportedly suffer from headaches. This proportion dropped to 28.6% in Zone 2. More than one-fifth of children in households surveyed in Zone 1 (21%) reportedly suffer from nosebleeds. This proportion dropped slightly in Zone 2, to 18.2%. Nearly 40% of Zone 1 respondents (37.3%) reported that they experienced chest pain, heart palpitations, or both at least 1 day per week in the past month. This proportion dropped to 27.8% in Zone 2. Approximately one-third of Zone 1 respondents (33.5%) reported that they experienced wheezing and/or difficulty breathing at least 2 days per week in the past month. This proportion dropped to 24.3% in Zone 2. More than half of Zone 1 respondents (50.6%) reported that they experienced headaches, dizziness, and/or lightheadedness at least 2 days per week in the past month. This proportion dropped to 37.5% in Zone 2. Nearly half of Zone 1 respondents (44.5%) reported that they experienced eye pain/irritation and/or watery eyes at least 2 days per week in the past month. This proportion was roughly the same in Zone 2 (43.6%). More than 40% of Zone 1 respondents (41.1%) reported that they experienced cough, sneezing, and/or sore/hoarse throat at least 4 days per week in the past month. This proportion dropped to 33.6% in Zone 2. More than one-third of Zone 1 respondents (34.6%) reported that they experienced skin rash/irritation and/or itchy skin at least 2 days per week in the past month. This proportion dropped slightly in Zone 2, to 30.5%. Nearly 30% of Zone 1 respondents (29.3%) reported that they experienced fatigue/lethargy at least 4 days per week in the past month. This proportion dropped to 22.8% in Zone 2.

Pollution data. Approximately half of Zone 1 respondents (49.4%) reported that they smell chemical odors while inside their homes ''at least a few times per month.'' This proportion dropped to 31.3% in Zone 2. More than half of Zone 1 respondents (51.7%) reported that they smell chemical odors while outside their homes ''at least a few times per week.'' This proportion dropped to 42.1% in Zone 2. More than three-fourths of Zone 1 respondents (76.4%) reported that they smell chemical odors while outside their homes ''at least a few times per month.'' This proportion dropped to 67.2% in Zone 2. 84.0% of Zone 1 respondents reported that they are ''extremely concerned'' about pollution in their community. This proportion dropped to 63.7% in Zone 2.

DISCUSSION

To our knowledge, this is the first study conducted in Cancer Alley that evaluates the potential link between household proximity to a particular industrial facility and reported adverse health outcomes. Our analysis yielded three major findings. First, cancer prevalence among the survey sample is significantly higher than what is considered likely using Monte Carlo simulations based on SEER prevalence data. Second, cancer prevalence among the survey sample is associated with proximity to the Denka facility, with significantly higher-than-likely prevalence in the zone closer to the facility and lower prevalence in the zone further from the facility. Third, levels of chloroprene-linked health symptoms among the survey sample—including among children—are high and also associated with proximity to the Denka facility.

Across the survey area as a whole, cancer prevalence among residents surveyed is significantly higher than what is considered likely for a U.S. population with the same race, sex, and age makeup. Removing residents who live in households where anyone smokes on a daily basis does not alter this result. When cancer prevalence among the survey sample is analyzed by spatial zone, prevalence in the zone closer to the Denka facility (Zone 1) is more statistically significant (with a p-value 10 times lower) than prevalence in the survey area as a whole. Prevalence in Zone 1 is higher than prevalence in Zone 2, further from the facility. Again, applying the smoking exclusion criterion does not alter this result.

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Our findings on other adverse health outcomes linked to chloroprene exposure show that high proportions of respondents regularly experience cardiac symptoms, difficulty breathing, headaches, eye irritation, respiratory symptoms, skin irritation, and fatigue. In virtually every case, respondents who live closer to the Denka facility (Zone 1) are affected in higher proportions than respondents who live further away (Zone 2).

Our findings on child health show that >40% of children in surveyed households in Zone 1 suffer from headaches, an outcome linked to short- and long-term chloroprene exposure. Since the beginning of their struggle for environmental justice, Concerned Citizens of St. John Parish has advocated for the health and well-being of the children in their community. In particular, Fifth Ward Elementary School—located less than a third of a mile from the Denka facility—has been a focal point of activism.[27]

A strength of the study was the random sampling design, which reduced the possibility of selection bias. Race data from survey samples in Zones 1 and 2 were representative of the respective larger areas: according to American Community Survey data, Zone 1 is 95% Black and 5% white (compared with 93% Black and 5% white in the survey sample) and Zone 2 is 71% Black and 27% white (compared with 68% Black and 27% white in the survey sample).[28] Additional strengths of the study included the spatial analysis of the data, that is, the use of geographic zones by proximity to the facility; the consideration of confounding variables such as smoking, age, sex, and race; the value of field epidemiology, that is, data collection in the field to investigate concerns about community health; and the strong partnership and relationship of trust between researchers and community members, which facilitated the design of a robust survey instrument (including through the use of focus groups) and collection of a large amount of data. Survey respondents were neither aware that the study design relied on the use of geographic zones nor aware of the zone in which their residence was located, reducing the possibility of awareness bias.

A limitation of the study was the reliance on self-reported health information provided by a single household member about all members of the household. On the one hand, respondents may have underreported other household members' health conditions. On the other hand, awareness bias in respondents who were concerned about air pollution, their own health, or household members' health may have increased reporting of adverse health outcomes. Other limitations included the use of only two comparison groups, limiting the ability to conduct statistical tests; the lack of reliable statistics to enable robust comparison of symptoms data; and potential confounding factors that were not considered, such as inclusion of multiple household members who share an indoor environment and may share genetics. In addition, our use of proximity to the facility was an indirect measure of exposure to air emissions; more precise measures of exposure include air monitoring and biomonitoring of individuals. Finally, stigma associated with illness—especially cancer—in the community may have led to a nonresponse bias that favored healthier individuals and households.

None of our findings came as a surprise to community members; rather, the study findings were consistent with community members' lived experiences. Community members view the health study as a useful tool to advance their struggle for clean air. Simultaneously—5 years after discovering that they face the highest likelihood in the country of developing cancer from air pollution—residents are weary of hearing and reading about adverse health outcomes and pollution in their community and believe that it is long past time for action. More than sufficient evidence of chloroprene toxicity and community suffering has been collected to justify action; now, the state must compel Denka Performance Elastomer to reduce emissions so that chloroprene air concentration does not exceed EPA's maximum guideline of 0.2 $\mu g/m^3$.

CONCLUSION

EPA's estimate of cancer risk alone should have been enough to warrant swift and decisive action. As valuable as they are, health studies such as this one should not be necessary to compel decision makers to act to protect public health. Consistent with the precautionary principle in environmental science—which maintains that "when an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically"—action to protect public health in St. John should be taken on the basis of EPA's estimate of cancer risk in the parish.[29] Producing definitive scientific proof of a cause-and-effect relationship between chloroprene emissions and cancer in the area of the Denka facility would be virtually impossible—a feature of scientific uncertainty that polluting industries have long exploited to maintain their potentially toxic activities. Communities across Cancer Alley should not have to bear the burden of proof to achieve environmental justice. It is long past time for this burden to shift to Denka and other industries that are threatening human and environmental health.

ACKNOWLEDGMENTS

We extend our deepest gratitude to the St. John Parish residents who participated in this study. James Cavallaro, Executive Director of the University Network for Human Rights, played an instrumental role in the survey

[27]Nick Reimann. "St. John School Board panel suggests study on moving students from school near chemical plant." *The Advocate*, 27 August 2019. <https://www.nola.com/news/education/article_275fc7d2-c83a-11e9-8fa9-87f1f4a3225a.html>. (Last accessed February 10, 2021).

[28]The EPA's EJSCREEN tool was used to generate maps of Zones 1 and 2 and download 2013–2017 American Community Survey data for each zone.

[29]David Kriebel, Joel Tickner, Paul Epstein, John Lemons, Richard Levins, Edward L. Loechler, Margaret Quinn, Ruthann Rudel, Ted Schettler, and Michael Stoto. "The Precautionary Principle in Environmental Science." *Environmental Health Perspectives* 109 (2001): 871.

implementation process and provided constructive feedback throughout the data analysis phase. Elan Dagenais provided invaluable assistance with data analysis. Finally, we thank our 14 survey implementers: Ravi Chandra, Neha Chetry, Julia Daniel, Vance Farrant, Hattie Gawande, Yu Jin Lee, Sarah Maung, Kinsey Morrison, Keith Nobbs, Lorenzo de la Puente, Noam Shemtov, Hannah Smith, Mauranda Upchurch, and Alisha Zhao.

AUTHOR DISCLOSURE STATEMENT

No competing financial interests exist.

FUNDING INFORMATION

This study was designed and implemented while the first author was an instructor at Stanford University. As such, all hard costs of survey implementation were assumed by Stanford University. When the first author transitioned employment to co-found the University Network for Human Rights, the study was in the data analysis phase and no additional hard costs were incurred.

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Appendices

APPENDIX A1

Stanford University

Community Health Survey
St. John the Baptist Parish

Participant ID#: _____
Data Collector 1: _____
Data Collector 2: _____
Date: _____Time: _____

First, I'd like to ask some basic questions about you and each member of your household. We won't record names, just first initials.

Initial	**Age** (years)	**Sex** (M/F)	**Blood relative?** (Y/N)	**Part- or full-time resident***	**School (if 18 or under)**
			N/A (self)		

*A part-time resident is someone who lives in the household for 1–5 days of the week (inclusive)

(*Appendix continues* →)

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Now I'm going to ask you some basic questions about yourself, where you live, and where you used to live.

1. What is your race/ethnicity? (check all that apply)	☐ Asian ☐ Black or African American ☐ Hispanic/Latina/Latino/Latinx ☐ Native American ☐ Native Hawaiian and Other Pacific Islander ☐ White ☐ Other: _____
2. How long have you lived in this home?	☐ Less than one year ☐ ___ year(s)
3. Where did you live before moving to this home? (*city and state*)	
4. How long did you live in your previous home?	☐ Less than one year ☐ ___ year(s)

5. Now I'm going to ask you some questions about your medical history and the medical histories of others in your household. I'm going to go through a list of medical conditions. For each medical condition, I'll ask you whether a doctor or another health care provider has ever told you or anyone else in your household that you or they have the condition, and if so, what year you or they were told that. (*For the survey respondent, write yes or no, and year if relevant and known. For household members, provide the initial of every household member who has received the diagnosis, as well as year of diagnosis, if known.*)

	Yourself? (*yes/no, year*)	**Household members?** (*if yes, initial and year*)
a. ADHD?		
b. Allergies?		
c. Asthma?		
d. Anemia?		
e. Birth defects? Which one(s):		
f. Bronchitis?		
g. Congestive heart failure?		
h. Diabetes, other than during pregnancy?		
i. Heart disease?		
j. High blood pressure?		
k. Hyperthyroidism?		
l. Hypothyroidism?		
m. Learning difficulties?		
n. Nodules or a mass on the liver?		
o. Nodules or a mass on the lung(s)?		
p. Rapid pulse or rapid heartrate?		
q. Sinus infection?		

(*Appendix continues* →)

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6. Now I'm going to ask about all members of your household and whether or not they had cancer, beginning with yourself. Please tell me the month and year of diagnosis, if possible. If members of your household had cancer and died, we will ask you about them afterward.

Type of cancer	**Yourself?** (*yes/no, month & year*)	**Household members?** (*if yes, initial and month & year*)
a. Bladder cancer		
b. Brain cancer		
c. Breast cancer		
d. Colon cancer		
e. Esophageal cancer		
f. Kidney cancer		
g. Leukemia		
h. Liver cancer		
i. Lung cancer		
j. Lymphoma		
k. Melanoma		
l. Oral cancer		
m. Ovarian cancer		
n. Pancreatic cancer		
o. Prostate cancer		
p. Sarcoma		
q. Skin cancer		
r. Spleen cancer		
s. Thyroid cancer		
t. Uterine cancer		
u. Other (*specify*):		

Now I'm going to ask you a few questions about others in your household and family.

7a. Has anyone in this household had cancer and died in the past 20 years?

☐ Yes
If YES, who? (*use first initial*): _____
☐ No
☐ Don't know

If YES to 7a…
7b. What kind of cancer did that person have? (*initial: type of cancer*)
7c. What was that person's relationship to you? (*initial: relationship*)
7d. Were they a blood relative? (*initial: Y/N/IDK*)
7e. What was their sex? (*initial: M/F*)
7f. How old were they when they died? (*initial: age at death*)
7g. What year did they die? (*initial: year*)

(*Appendix continues* →)

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8a. Has anyone in your immediate family had cancer and died, who we haven't already talked about? This includes your parents, siblings, spouse, and children.

☐ Yes
If YES, who? (*use first initial*): _____
☐ No
☐ Don't know

If YES to 8a…
8b. What kind of cancer did that person have? (*initial: type of cancer*)
8c. What was that person's relationship to you? (*initial: relationship*)
8d. Were they a blood relative? (*initial: Y/N/IDK*)
8e. What was their sex? (*initial: M/F*)
8f. How old were they when they died? (*initial: age at death*)
8g. What year did they die? (*initial: year*)
8h. Did they live in St. John the Baptist Parish? (*initial: Y/N/IDK*)
If YES to 8h:
8i. What city? (*initial: city*)

9a. Has anyone in this household ever had a miscarriage?

☐ Yes
If YES, who? (*use first initial*): _____
☐ No
☐ Don't know

If YES to 9a…
9b. When did the miscarriage(s) happen? (*initial: year*)
9c. At what stage(s) of pregnancy did the miscarriage(s) happen? (*initial: week or month*)
9d. Did that person live in St. John the Baptist Parish at the time of the miscarriage(s)? (*initial: Y/N/IDK*)
If YES to 9d:
9e. What city? (*initial: city*)

10a. Has anyone in this household ever had a stillbirth (loss at 20+ weeks)?

☐ Yes
If YES, who? (*use first initial*): _____
☐ No
☐ Don't know

If YES to 10a…
10b. When did the stillbirth(s) happen? (*initial: year*)
10c. Did that person live in St. John the Baptist Parish at the time of the stillbirth(s)? (*initial: Y/N/IDK*)
If YES to 10c:
10d. What city? (*initial: city*)
11a. Do any children in the household suffer from nosebleeds?
If YES to 11a…
11b. Who suffers from nosebleeds? (*Use initials*)
11c. In the past month, how many nosebleeds did they have? (*Write number next to initials*)

12a. Do any children in the household suffer from headaches?
If YES to 12a…
12b. Who suffers from headaches? (*Use initials*)
12c. In the past month, how many headaches did they have? (*Write number next to initials*)

(*Appendix continues* →)

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Now I'm going to ask you some questions about yourself.

13. How would you rate your current overall health?	☐ Very good ☐ Good ☐ Fair ☐ Poor ☐ Very Poor
14a. In the past 12 months, have you visited a doctor or other health care provider for treatment or consultation about a medical condition?	☐ Yes ☐ No
If YES, to 14a… **14b.** Approximately how many times?	

15. In the past month, how often did you experience the following symptoms?

	Never	1 day per week	2–3 days per week	4–5 days per week	6–7 days per week
a. Achiness					
b. Chest pain					
c. Cough					
d. Difficulty breathing					
e. Dizziness					
f. Eye pain or irritation					
g. Fatigue/lethargy					
h. Headaches					
i. Heart palpitations*					
j. Itchy skin					
k. Joint pain					
l. Light headedness					
m. Nosebleeds					
n. Skin rash or irritation					
o. Sneezing					
p. Sore/hoarse throat					
q. Watery eyes					
r. Weakness					
s. Wheezing					
t. Other: _____					

*Palpitations are when you feel like your heart is beating too hard, too fast, skipping a beat, or fluttering.

Now I have a few questions about the environment near your home.

16. How concerned are you about pollution in your community?	☐ Not at all concerned ☐ Slightly concerned ☐ Moderately concerned ☐ Extremely concerned
17. How often do you smell chemical odors while inside your home?	☐ Never ☐ A few times per year ☐ A few times per month ☐ A few times per week ☐ Daily
18. How often do you smell chemical odors while outside your home?	☐ Never ☐ A few times per year ☐ A few times per month ☐ A few times per week ☐ Daily

(*Appendix continues* →)

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The next few questions I'm going to ask are about whether or not you work or have ever worked at an industrial facility. The reason we ask these questions is to get a sense of any potential exposure to chemicals as a result of your workplace.

19a. Does your job involve working on the property of an industrial facility or plant? (*It doesn't matter whether you're employed by the facility itself, by a contractor of the facility, or by a servicing company – only whether you work on the site of an industrial facility.*)	☐ Yes ☐ No ☐ Don't know
If YES to 19a…	
19b. How long have you worked on the property of an industrial facility?	☐ Less than one year ☐ ___ year(s)
19c. Approximately how many hours per week do you work on the property of an industrial facility?	
If NO to 19a…	
19d. Has your job ever involved working on the property of an industrial facility or plant? (*It doesn't matter whether you were employed by the facility itself, by a contractor of the facility, or by a servicing company – only whether you worked on the site of an industrial facility.*)	☐ Yes ☐ No ☐ Don't know
If **YES** to 19d…	
19e. How long did you work on the property of an industrial facility?	☐ Less than one year ☐ ___ year(s)
19f. Approximately how many hours per week did you work on the property of an industrial facility?	

Now I'm going to ask you a few short questions about tobacco use.

20. How often does anyone smoke inside your home? Would you say daily, weekly, monthly, less than monthly, or never?	☐ Daily ☐ Weekly ☐ Monthly ☐ Less than monthly ☐ Never ☐ Don't know
21a. Altogether, have you smoked at least 100 or more cigarettes, cigars, or other tobacco products in your entire lifetime?	☐ Yes ☐ No ☐ Don't know
If YES to 21a…	
21b. For how many years have you smoked?	☐ Less than one year ☐ ____year(s)
21c. How many days per week did you smoke in the last month?	☐ 7 days per week ☐ 2 to 6 days per week ☐ 1 or fewer days per week
22. Finally, are there any other relevant health or environmental issues that we haven't talked about that you think we should know?	

Thank you for your time!

(*Appendix continues* →)

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APPENDIX A2

Code Abstract

```
```{r}
# 'residents' refers to the dataframe containing one row per resident represented in the survey.

# the lookup() function returns the corresponding SEER prevalence stat for the given race/age/sex input.

# This arbitrary seed has been set for all Monte Carlo calculations.
set.seed(140637)
# setting loop to repeat simulation 10,000 times.
for(i in 1:10000) {
sim <- c() # creating/resetting an empty vector to store the next simulated values.

# setting loop to run calculation for each resident (i.e., each row in 'residents' dataframe).
for(j in 1:nrow(residents)) {
# retrieving relevant SEER prevalence stat as a decimal.
x <- lookup(residents$race[j], residents$age[j], residents$sex[j])

# assigning a resident a simulated binary cancer diagnosis (1, cancer; 0, no cancer) using their SEER stat (x) as probability.
sim[j] < - sample(c(0,1), size = 1, replace = TRUE, prob = c(1-x, x))
}
# the vector of simulated resident cancer diagnoses are saved to be compiled (cbind()) with the others.
}


# The final result gives a data frame with one row per resident, along with a column per simulation (10,000), each cell containing
# either 0 or 1 based on the sampled value. The sum of each column divided by the number of rows then gives the cancer prevalence
# for the simulation. These 10,000 simulated prevalences naturally give a normal distribution with the median simulated prevalence
# at its center. P-values are then calculated by the number of simulated prevalences >= the survey population's cancer prevalence,
# divided by the number of simulations (10,000).
```
```

(*Appendix continues* →)

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Appendix Table A1. Demographic Breakdown of Survey Population and Corresponding Surveillance, Epidemiology, and End Results Probabilities

Race	*Sex*	*Age*	*Total sample size*	*Zone 1 sample size*	*Zone 2 sample size*	*SEER probability (%)*
Black	M	0–9	85	49	36	0.0692
Black	M	10–19	104	48	56	0.1382
Black	M	20–29	82	54	28	0.2256
Black	M	30–39	65	37	28	0.4453
Black	M	40–49	65	40	25	1.1497
Black	M	50–59	89	58	31	4.1103
Black	M	60–69	84	54	30	12.8086
Black	M	70–79	46	23	23	24.8125
Black	M	80+	11	8	3	29.4374
Black	F	0–9	71	40	31	0.0634
Black	F	10–19	107	55	52	0.1352
Black	F	20–29	56	28	28	0.2442
Black	F	30–39	80	48	32	0.7119
Black	F	40–49	90	45	45	2.0842
Black	F	50–59	91	59	32	4.6132
Black	F	60–69	79	50	29	8.3256
Black	F	70–79	59	35	24	11.8842
Black	F	80+	28	20	8	12.1149
White	M	0–9	8	0	8	0.0947
White	M	10–19	10	0	10	0.2258
White	M	20–29	12	1	11	0.4143
White	M	30–39	10	1	9	0.7700
White	M	40–49	10	1	9	1.5339
White	M	50–59	14	1	13	3.8687
White	M	60–69	18	1	17	10.3809
White	M	70–79	9	3	6	21.9162
White	M	80+	7	1	6	29.0692
White	F	0–9	7	0	7	0.0909
White	F	10–19	10	0	10	0.2003
White	F	20–29	11	1	10	0.4296
White	F	30–39	14	0	14	1.1432
White	F	40–49	5	0	5	2.9117
White	F	50–59	9	2	7	5.9617
White	F	60–69	16	3	13	10.3736
White	F	70–79	15	5	10	15.3738
White	F	80+	5	2	3	16.9960
Hispanic	M	0–9	2	0	2	0.0842
Hispanic	M	10–19	4	1	3	0.1992
Hispanic	M	20–29	1	1	0	0.3187
Hispanic	M	30–39	2	0	2	0.5131
Hispanic	M	50–59	1	0	1	2.3494
Hispanic	M	80+	1	0	1	21.1148
Hispanic	F	0–9	6	1	5	0.0749
Hispanic	F	20–29	2	1	1	0.2970
Hispanic	F	30–39	2	0	2	0.7641
Hispanic	F	40–49	1	0	1	1.9653
Hispanic	F	50–59	2	0	2	4.1819
Hispanic	F	70–79	1	0	1	9.9048
Total			1507	777	730	

SEER, Surveillance, Epidemiology, and End Results.

(*Appendix continues* →)

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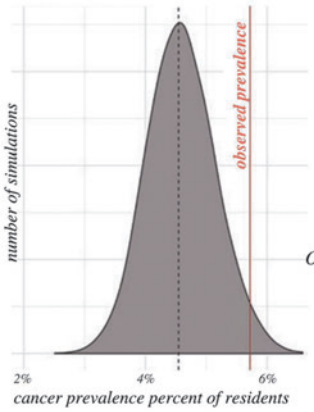
*Simulated and observed 23-year cancer prevalence**



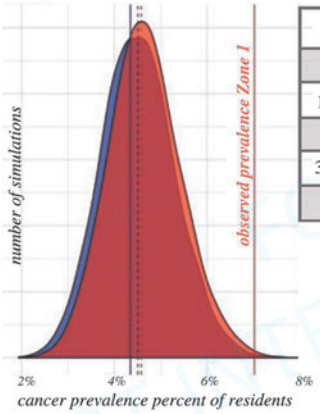
Simulated Cancer Prevalence

Statistic	Value
Minimum	2.5%
1st Quartile	4.2%
Median	4.5%
3rd Quartile	4.9%
Maximum	6.6%

Observed cancer prevalence: **5.4%**
p-value: **0.0306**

**after removing all residents who live in households where anyone smokes on a daily basis*

*Simulated and observed 23-year cancer prevalence by zone**



Simulated Cancer Prevalence

Statistic	Zone 1 value	Zone 2 value
Minimum	2.0%	1.9%
1st Quartile	4.1%	4.0%
Median	4.6%	4.5%
3rd Quartile	5.2%	5.0%
Maximum	8.1%	7.6%

Observed cancer prevalence:
Zone 1: **7.0%**; Zone 2: **4.3%**
p-value:
Zone 1: **0.0032**; Zone 2: **0.6139**

**after removing all residents who live in households where anyone smokes on a daily basis*

APPENDIX FIG. A1.

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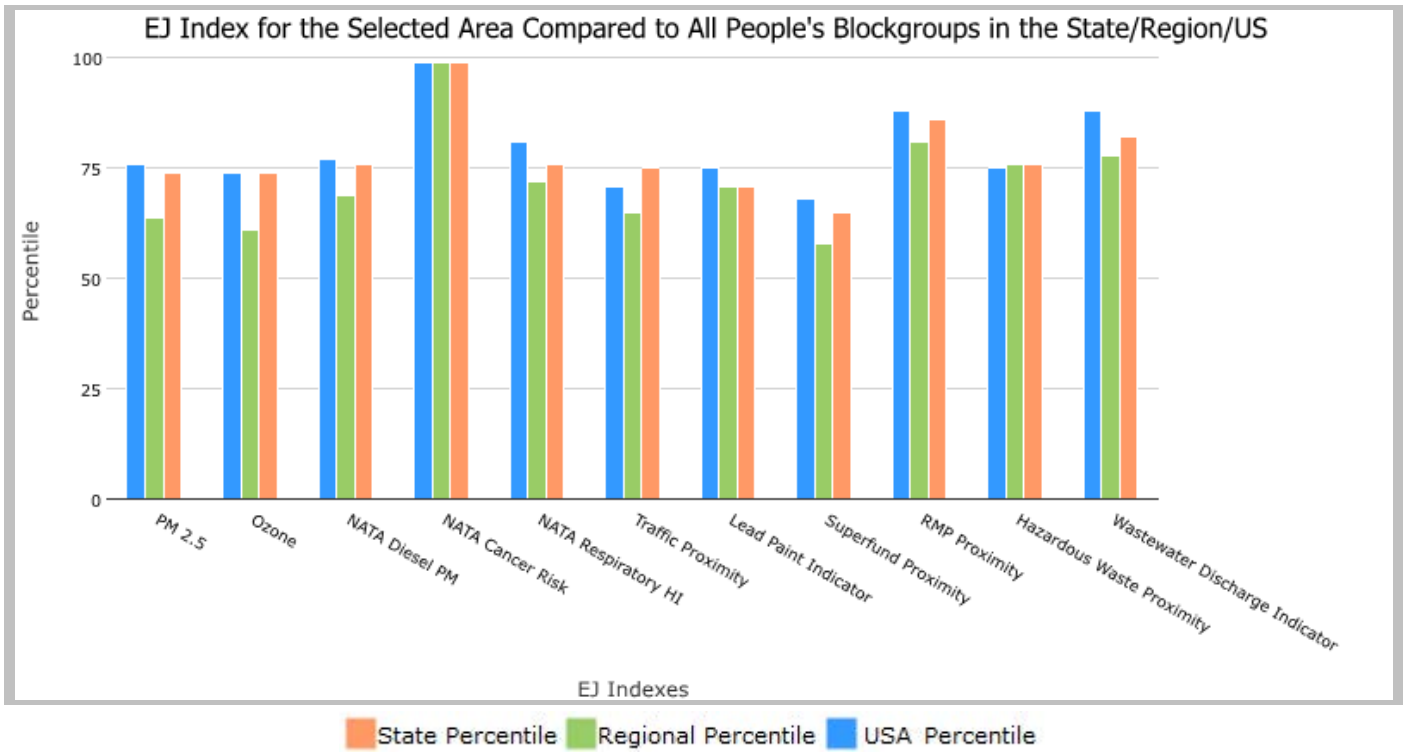
EJSCREEN Report (Version 2020)

County: St. John the Baptist Parish, LOUISIANA, EPA Region 6

Approximate Population: 43,446

Input Area (sq. miles): 409.85

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	74	64	76
EJ Index for Ozone	74	61	74
EJ Index for NATA* Diesel PM	76	69	77
EJ Index for NATA* Air Toxics Cancer Risk	99	99	99
EJ Index for NATA* Respiratory Hazard Index	76	72	81
EJ Index for Traffic Proximity and Volume	75	65	71
EJ Index for Lead Paint Indicator	71	71	75
EJ Index for Superfund Proximity	65	58	68
EJ Index for RMP Proximity	86	81	88
EJ Index for Hazardous Waste Proximity	76	76	75
EJ Index for Wastewater Discharge Indicator	82	78	88



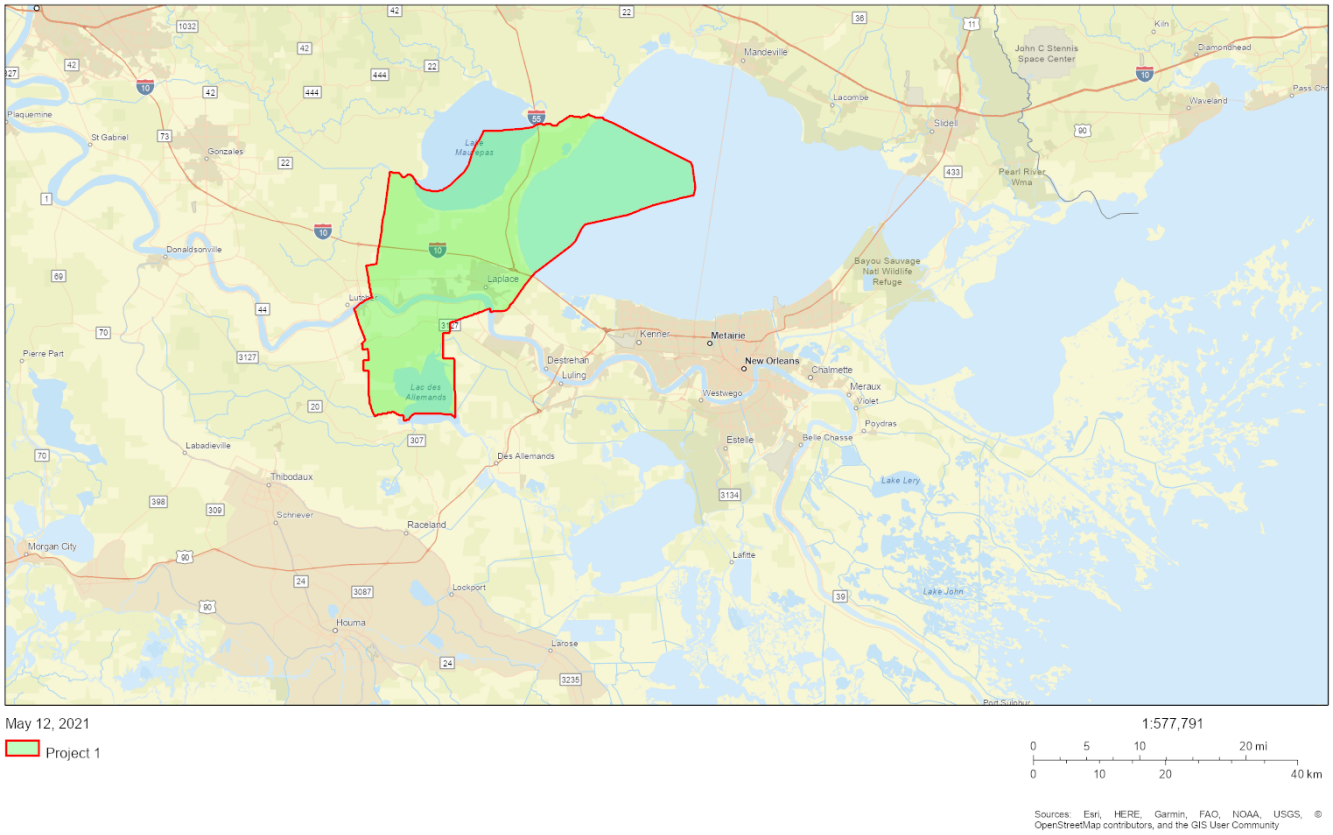
This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJSCREEN Report (Version 2020)

County: St. John the Baptist Parish, LOUISIANA, EPA Region 6

Approximate Population: 43,446

Input Area (sq. miles): 409.85



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	11

EJSCREEN Report (Version 2020)

County: St. John the Baptist Parish, LOUISIANA, EPA Region 6

Approximate Population: 43,446

Input Area (sq. miles): 409.85

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	8.85	8.91	53	8.95	30	8.55	59
Ozone (ppb)	36.3	36.2	62	41.8	17	42.9	14
NATA* Diesel PM (µg/m^3)	0.463	0.455	60	0.401	60-70th	0.478	60-70th
NATA* Cancer Risk (lifetime risk per million)	400	51	99	36	95-100th	32	95-100th
NATA* Respiratory Hazard Index	0.67	0.61	80	0.45	95-100th	0.44	90-95th
Traffic Proximity and Volume (daily traffic count/distance to road)	140	330	55	400	50	750	42
Lead Paint Indicator (% Pre-1960 Housing)	0.14	0.21	53	0.17	64	0.28	44
Superfund Proximity (site count/km distance)	0.022	0.086	25	0.081	30	0.13	19
RMP Proximity (facility count/km distance)	1.8	0.9	83	0.82	87	0.74	89
Hazardous Waste Proximity (facility count/km distance)	1.2	1.5	57	0.99	73	5	54
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0.0036	1.7	67	9.5	70	9.4	73
Demographic Indicators							
Demographic Index	51%	40%	69	44%	62	36%	74
People of Color Population	65%	41%	75	52%	63	39%	75
Low Income Population	37%	39%	49	37%	54	33%	63
Linguistically Isolated Population	2%	2%	70	6%	44	4%	53
Population With Less Than High School Education	14%	15%	51	16%	54	13%	66
Population Under 5 years of age	7%	7%	54	7%	49	6%	58
Population over 64 years of age	13%	15%	47	13%	57	15%	47

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1201 ELM STREET, SUITE 500
DALLAS, TEXAS 75270

Office of the Regional Administrator

December 16, 2020

Dr. Chuck Carr Brown, Secretary
Louisiana Department of Environmental Quality
Post Office Box 4314
Baton Rouge, Louisiana 70821-4314

RE: Extension of EPA's Continuous Air Monitoring Program near the Denka Performance Elastomer Facility in LaPlace, La.

Dear Dr. Brown,

The U.S. Environmental Protection Agency (EPA) thanks you and your staff for your support of EPA's air quality monitoring efforts in LaPlace, LA, including both the 2016-2020 community ambient air monitoring program and our ongoing Continuous Air Monitoring Program. This letter is to provide an update on our Continuous Air Monitoring Program and notify you that EPA will be extending the Continuous Air Monitoring Program for an additional 60 days to cover the rescheduled turn-around at the plant. This has been one of our original objectives, but the plant postponed their November 2020 turn-around until late January 2021.

As you are aware, EPA has been working with the community on issues related to air contaminants for many years and began a Continuous Air Monitoring Program in March 2020. The Continuous Air Monitoring Program was designed to help EPA understand the magnitude and frequency of occasional, but recurring, elevated chloroprene measurements or "spikes" that, as demonstrated by the Community Ambient Air Monitoring data, contribute significantly to the long-term chloroprene averages. Another objective of the Continuous Air Monitoring Program is to help identify unknown or under-characterized emissions sources or activities at the Denka Performance Elastomer, LLC facility.

The Initial Phase of the project lasted longer than initially anticipated—about six months—as a result of instrumentation quality checks and assessment, and refining of the triggering methodology used for canister sampling. The Operational Phase began in September 2020 and was scheduled to operate until December 2020, barring any unforeseen circumstances. However, to collect data during the plant turn-around now scheduled in late January 2021, we are extending the Operational Phase of the Continuous Air Monitoring Program for approximately 60 days.

The Initial Phase of the project resulted in the collection of 55 samples with an overall chloroprene average of 0.408 $\mu g/m^3$. As of October 29, 2020, the Operational Phase of the project resulted in the collection of 30 samples with an overall chloroprene average of 2.450 $\mu g/m^3$.

EPA will continue posting chloroprene sampling results from the Continuous Air Monitoring Program to the Denka Air Monitoring Data Summary Page: https://www.epa.gov/la/denka-air-monitoring-data-summary.

Thank you again for your support in these efforts to monitor air quality in LaPlace.

Sincerely,

Ken McQueen
Regional Administrator