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To Whom it May Concern:

The Children's Environmental Health Center at the Icahn School of Medicine at Mount Sinai [recommends against the use of gas-powered leaf blowers](#) (GLBs) to protect the health of residents and lawn care workers from the air and noise pollutants they produce.

AIRBORNE POLLUTANTS: GLBs are a major source of air pollutants that affect health both directly when inhaled and indirectly through acceleration of climate change. GLB combustion engines are extremely low efficiency; 30% of the gas and oil that they use is unburned and released directly to the atmosphere. GLBs emit and expose users to significant quantities of pollutants known to cause cancer or serious health problems including carbon monoxide, formaldehyde, benzene, nitrogen oxides, hydrocarbons, and fine particulate matter (PM_{2.5}). The California Air Resources Board (CARB) estimates that emissions released during the operation of a GLB for one hour are equivalent to driving a car for 15 hours or 1100 miles.¹ A 2011 study found gas-powered lawn and garden equipment collectively emit **27 million tons of pollutants** of VOCs, nitrogen oxides, carbon monoxide, and PM_{2.5} per year.² In addition to affecting respiratory health and increasing asthma risk and severity, these pollutants are associated with numerous health outcomes including **autism, cancer, heart disease, dementia, and shortened lifespan.**³

The handful of studies that have examined worker exposures to harmful emissions from GLBs and other small 2-stroke engines demonstrate unnecessary risk associated with the use of this equipment. Of 100,000 deaths estimated to result from human-generated PM_{2.5} each year, 1,400 are attributed to lawn and garden equipment use.⁴ Direct measurement of worker exposure through personal air monitoring during operation of GLBs finds exposures above EPA National Ambient Air Quality Standards (NAAQS) for both PM_{2.5} and carbon monoxide.⁵ Lastly, workers using 2-stroke engine chain saws with similar emissions to GLBs experience exposure to carcinogens at levels that increase cancer risk.⁶

GLBs are also a significant contributor to ground level ozone, an air pollutant linked to asthma and poor respiratory health that is frequently elevated particularly in suburban or urban environments.⁷ A recent study

¹<https://ww2.arb.ca.gov/resources/fact-sheets/sore-small-engine-fact-sheet>

² Banks and McConnell 2015 National Emissions from Lawn and Garden Equipment <https://www.epa.gov/sites/default/files/2015-09/documents/banks.pdf>.

³ Flanagan et al. 2023 Exposure to local, source-specific ambient air pollution during pregnancy and autism in children: a cohort study from southern Sweden. *Scientific Reports* 13:3848 <https://doi.org/10.1038/s41598-023-30877-5>

⁴ Thakrar et al. 2020 Reducing Mortality from Air Pollution in the United States by Targeting Specific Emission Sources. *Environ. Sci. Technol. Lett.* 2020, 7, 639–645.

⁵ Baldauf et al. 2006 Air contaminant exposures during the operation of lawn and garden equipment. *J. Exp. Sci. and Environ. Epi* (2006) 16, 362–370.

⁶ Frank N. Dost. Toxicology and potential health risk of chemicals that may be encountered by workers using forest vegetation management options. Part I, Risk to workers associated with exposure to emissions from power saws. ISBN 0-7726-4985-5

⁷<https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution>



of Colorado ozone sources conducted by the Public Interest Research Group (PIRG) estimated that gas-powered leaf blowers and other lawn maintenance equipment contribute to the production of almost half as much ozone as all automobiles in the state.⁸ **Restricting the use of this equipment would have a measurable impact on air pollution levels and positively affect health outcomes.**

In addition to direct emissions from fuel combustion, air released from GLBs can reach speeds of 200 mph, sending dust, pollen, pesticides, mold, and heavy metals in soil into the air where they can be breathed in. For the reasons highlighted above, the **American Lung Association Policy Position on Healthy Air** "...supports measures to reduce the air pollution impacts of combustion-based, fossil fuel-powered lawn mowers, leaf blowers and other small equipment, which contribute a significant share of the air pollution burden in parts of the U.S. The American Lung Association supports the transition to electric small equipment".⁹

NOISE: GLBs can expose users to greater than 100 decibels (dB), the equivalent to a jackhammer or a jet taking off, and well above the level at which chronic noise exposure leads to irreparable hearing loss. In fact, the Centers for Disease Control and Prevention guidance on noise utilizes GLBs to exemplify the noise level at which hearing loss can occur (see figure below). Risks are not limited to operators; manufacturer data and independent studies show that bystanders as far as 50 feet from an operating GLB may be exposed to 70 dB, higher than the World Health Organization (WHO) recommended guideline for general daytime outdoor noise levels of 55 dB or less.¹¹ Further, the low frequency sound produced by GLBs travels long distances and can penetrate walls and windows.^{10,11}

In addition to damaging hearing, noise exposure is linked to cardiovascular disease and dementia and affects quality of life by impairing communication and learning, reducing ability to accurately complete complex tasks, and increasing stress.^{12,13,14} For these reasons, the **American Public Health Association, WHO, and American Academy of Pediatrics consider noise a public health hazard.**^{15,16,17}

⁸<https://pirg.org/colorado/foundation/resources/small-machines-big-pollution/>

⁹<https://www.lung.org/policy-advocacy/public-policy-positions/public-policy-position-healthy-air>

¹⁰Walker & Banks 2017 Characteristics of Lawn and Garden Equipment Sound: A Community Pilot Study J Environ Toxicol Stud. Nov 3;1(1):10.16966/2576-6430.106. doi: 10.16966/2576-6430.106

¹¹Pollock C et al. 2018. Lawn and Garden Equipment Sound: A Comparison of Gas and Battery Electric Equipment. J Environ Toxicol Stud. 3(1):dx.doi.org/10.16966/2576-6430.118

¹²Tortorella et al. 2022. New determinants of mental health: the role of noise pollution. A narrative review. International Review of Psychiatry, 34:7-8, 783-796, DOI:10.1080/09540261.2022.2095200

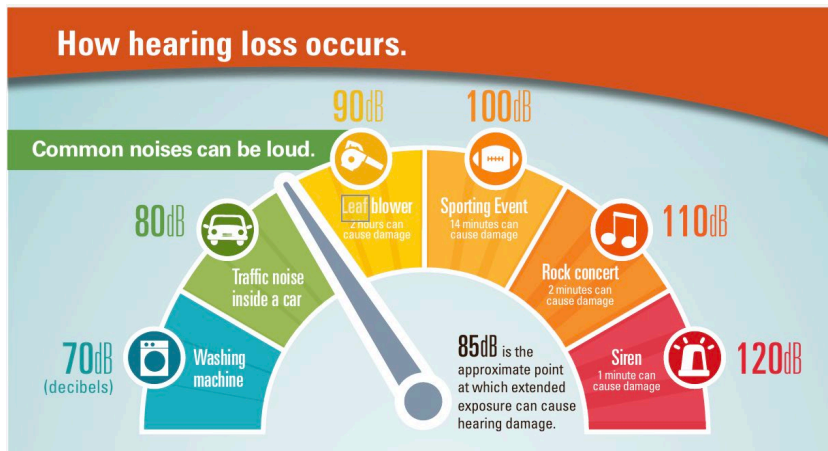
¹³Hadad et al. 2018 Annoyance to difference noise sources is associated with atrial fibrillation in the Gutenberg Health Study. Int. J. of Cardiology. 264:79-84. <https://doi.org/10.1016/j.ijcard.2018.03.126>

¹⁴Meng et al. Chronic Noise Exposure and Risk of Dementia: A Systematic Review and Dose-Response Meta-Analysis. Front Public Health. 2022; 10: 832881.doi: 10.3389/fpubh.

¹⁵<https://apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2022/01/07/noise-as-a-public-health-hazard>

¹⁶<https://www.who.int/publications/i/item/burden-of-disease-from-environmental-noise-quantification-of-healthy-life-years-lost-in-europe>

¹⁷Balk et al. 2023. American Academy of Pediatrics Policy Statement: Preventing Excessive Noise Exposure in Infants, Children, and Adolescents. Pediatrics 152 (5): e2023063752. <https://doi.org/10.1542/peds.2023-063752>.



Noise emitted from gas-powered leaf blowers reach levels that can damage hearing.

From CDC Vital Signs "Too Loud for Too Long", February 2017.¹⁸

Children's vulnerability to GLBs: As pediatric environmental health researchers and clinicians, we are particularly concerned about the impacts of pollution produced by GLBs on children's health. Children's rapidly developing lungs, ears, eyes, brains, and other organ systems are inherently more sensitive to environmental hazards than adults.¹⁹ Children breathe more air per pound of body weight per day than adults and thus inhale more pollutants that are emitted by this equipment. Fine particulates produced by high-powered GLBs penetrate deep into the lungs to exacerbate asthma and can enter the bloodstream to affect a wide range of bodily systems.²⁰ The American Academy of Pediatrics Policy Statement on Noise highlights the susceptibility of children to noise and urges policy-level action to reduce environmental noise.¹⁸

The burning of fossil fuels is associated with over 5 million excess deaths worldwide each year and an estimated tens of millions of Americans suffer negative health impacts of noise exposure including heart disease and hearing loss.^{21,22} Restricting the use of gas-powered leaf blowers is a major step towards protecting the health of children, families, and workers.

Thank you for your attention to this issue,

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¹⁸ <https://www.cdc.gov/vitalsigns/hearingloss/infographic.html>

¹⁹Bearer, CF. Neurotoxicology 21:925-934, 2000.

²⁰ Aithal et al. Air quality and respiratory health in children. Breathe. 2023 Jun 13;19(2):230040. doi: 10.1183/20734735.0040-2023.

²¹ Lelieveld et al. 2023. Air pollution deaths attributable to fossil fuels: observational and modelling study BMJ 2023; 383 doi: <https://doi.org/10.1136/bmj-2023-077784>.

²²Hammer et al. 2013. Environmental Noise Pollution in the United States: Developing an Effective Public Health Response. Environ Health Perspect. Dec 5;122(2):115-119. doi: 10.1289/ehp.1307272