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IN THE COURT OF COMMON PLEAS OF CHESTER COUNTY, PA
CIVIL ACTION – LAW

LORALEE WEST, BARBARA AND RONALD MATTSON, PETER AND KATHRYN MORRIS, CHRISTOPHER AND JENNIFER FRANKLIN, PATRICIA AND FRANCIS GREY, BRIAN AND DEBRA LORTIE, AND BRIAN AND DANA McELWEE, Plaintiffs, v. WAYNESBOROUGH COUNTRY CLUB OF CHESTER COUNTY, Defendant.	Docket No. 2023-02023-IR

AMICI CURIAE BRIEF IN SUPPORT OF PLAINTIFFS' OPPOSITION TO DEFENDANT'S MOTION FOR JUDGMENT ON THE PLEADINGS

INTRODUCTION AND SUMMARY OF ARGUMENT

This case implicates twin environmental harms that flow from the same conduct. The first is noise pollution from the sound of gunshots ringing out in a residential neighborhood. Plaintiffs' pleadings and briefing have amply addressed that injury. The second and more insidious is lead contamination resulting from the vast number of shotgun pellets that infect the waterways that run through the range and downstream into neighboring properties and connected waterways. That injury is the focus of this *amicus* brief. The Court can—and should—consider both harms when adjudicating this case.

As Plaintiffs have explained, the Waynesborough Country Club's ("Club's") trap range regularly subjects the surrounding environment to a barrage of shotgun-blast noise that causes a public nuisance, constitutes a trespass, and warrants injunctive relief. This noise not only shatters the tranquility that drew Plaintiffs and other residents to the neighborhood, and for which they paid a premium when buying their homes. It also negatively affects wildlife, which are known to change their behavior and suffer stress-related maladies when exposed to loud and prolonged noise. *See, e.g.*, Christine Erbe et al., *The Effects of Noise on Animals*, in 1 *Exploring Animal Behavior Through Sounds* 459–93 (2022), https://bit.ly/4aaByCZ.

Worse yet, as Plaintiffs' pleadings note, the steady and repeated discharge of standard shotgun ammunition deposits a large amount of lead into the Club's trap range. This lead presents a serious threat of contamination, potentially harming people, wildlife, and property values. *See* Complaint ¶¶ 67–76.

It is well established that lead exposure is harmful, and expended ammunition is a major source of such lead. Studies and experience have shown that wildlife routinely suffer health decline and death after consuming lead shot, leading to knock-on effects up the food chain as the lead-contaminated animal is consumed by predators or scavengers. Scientists have observed that

the lead fired from shotguns can dissolve when exposed to water, potentially contaminating ground and surface water resources on which both people and animals rely. The Club's trap range unavoidably exposes nearby residents and wildlife to these risks. And its proximity to flowing surface water may expose a much larger population to the lead that its activities are introducing into the ecosystem.

There is no question that this constitutes an actionable nuisance. Indeed, Pennsylvanians have constitutionalized their "right to . . . pure water, and to the preservation of the natural . . . values of the environment." Pa. Const. art. 1, § 27. And the myriad of environmental and health risks posed by the Club's trap range risks depriving the Plaintiffs of those crucial rights.

To protect against these harms and safeguard the rights of the Plaintiffs and their neighbors, this Court should issue the injunctive relief that the Plaintiffs request. *See First Phila Prep. Charter Sch v Commonwealth Dep't of Educ* , 179 A.3d 128, 132 n.2 (Pa. Commw. Ct. 2018). At the very least, it should deny the Club's motion for judgment on the pleadings. *See Front St. Dev. Assocs , L.P v. Conestoga Bank*, 161 A.3d 302, 307 (Pa. Super. Ct. 2017).

ARGUMENT

I. Lead Exposure Is Harmful.

At this point in history, there is no doubting that lead is dangerous. In adults, excessive lead exposure can cause a host of medical problems, including decreased kidney function, reproductive problems, and hypertension, among others. *See* U.S. Environmental Protection Agency, *Learn about Lead*, EPA (Feb. 7, 2024), https://bit.ly/4dpBkLh. For children, the effect is even worse. Heightened lead levels can lower a child's IQ, slow growth, cause anemia, and lead to behavioral and learning problems, among other problems. *See id.*; *see also, e.g., Dombrowski v. Gould Elecs., Inc* , 85 F. Supp. 2d 456, 476–78 (M.D. Pa. 2000) (finding company liable for lead-caused learning disabilities in children). And *in utero* exposure can damage a child's organs,

cause premature birth, or even lead to miscarriage. *See Learn About Lead*, *supra*; *see also* Dylan Matthews, *Lead Poisoning Could Be Killing More People Than HIV, Malaria, and Car Accidents Combined*, Vox (Sept. 14, 2023), https://bit.ly/3wlALS1 ("The authors [of a scientific research paper] estimate that some 5.5 million people die prematurely due to lead exposure every year, and that the problem as a whole imposes a social cost of $6 trillion a year.").

Lead also harms the environment at large. Lead's "toxic effects" are "broadly similar in all vertebrates," which means wildlife suffer from lead exposure much as humans do. Deborah J. Pain et al., *Effects of Lead from Ammunition on Birds and Other Wildlife A Review and Update*, 48 Ambio 935, 936 (2019), https://bit.ly/44pOmEy. For example, exposed birds suffer from anemia, lethargy, muscle wastage, loss of balance, ocular lesions, paralysis, and even death. *Id* at 936, 945. Exposed fish similarly suffer "a large range of toxic effects," including damage to their cardiovascular, endocrine, and central nervous systems. Ju-Wook Lee et al., *Toxic Effects of Lead Exposure on Bioaccumulation, Oxidative Stress, Neurotoxicity, and Immune Responses in Fish: A Review*, 68 Env't Toxicology & Pharmacology 101, 101 (2019), https://bit.ly/3wngUlo. And lead is harmful to plants as well. Excessive exposure has been tied to reduced seed germination, stunted growth, and impaired photosynthetic capacity, as well as other "toxic effects." Bertrand Pourrut et al., *Lead Uptake, Toxicity, and Detoxification in Plants*, 213 Rev. Env't Contamination & Toxicology 113, 114 (2011), https://bit.ly/3QvSdKj.

In short, the science is clear: Lead exposure harms both people and the environment. It is thus critical to avoid the unnecessary and excessive release of lead into the environment.

II. Ammunition Is A Major Source Of Environmental Lead.

One significant source of environmental lead is ammunition. *See, e.g.*, Jon M. Arnemo et al., *Health and Environmental Risks from Lead-based Ammunition: Science Versus Socio-Politics*, 13 EcoHealth 618, 618 (2016), https://bit.ly/3QtroGz. A typical 12-gauge shotgun shell used in

trap shooting contains about one ounce of lead shot, all of which is flung into the environment with each pull of the trigger. *See* Complaint ¶ 72; Don Currie, *The Right Load*, Nat'l Skeet Shooting Ass'n/Nat'l Sporting Clays Ass'n, https://bit.ly/3UIRtUL (last visited May 6, 2024). A typical trap shooter will pull the trigger dozens of times during a day at the range. *See Shotgun Sports*, Nat'l Shooting Sports Found., https://bit.ly/4dmN5SJ (last visited May 6, 2024) (explaining that "[a] round of trap consists of 25 targets per shooter"). And a typical trap range hosts dozens of shooters per day—resulting in hundreds of pounds of lead released into the environment. *See* Complaint ¶ 71 (estimating 225 pounds per shooting event at the Club).

That lead then travels beyond the shooting range. Birds often mistake pellets for food or gizzard stones and consume them. *See* N. De Francisco et al., *Review. Lead and Lead Toxicity in Domestic and Free Living Birds*, 32 Avian Pathology 3, 3 (2003), https://bit.ly/4dqxstj. The birds then fly away, carrying the shot off site. In the weeks that follow, the ingested lead dissolves, accumulates in vital organs, and poisons the bird. *See id.* at 3, 5–6. The bird either dies from lead poisoning or, weakened by it, falls prey to another animal. *See id.* at 5–6. Predators and scavengers eat the bird and may in turn be poisoned by the bioaccumulated lead. *See id.* For example, bald eagles are a "species of particular concern" for the Pennsylvania Game Commission because they frequently consume meat contaminated with shot or bullet fragments made of lead. *Lead Poisoning*, Pa. Game Comm'n, https://bit.ly/3y6Snl9 (last visited May 6, 2024); *see also, e.g.*, Krishna Ramanujan, *Bald Eagle Rebound Stunted by Poisoning from Lead Ammunition*, Cornell Lab of Ornithology (Apr. 4, 2022), https://bit.ly/3QtTMbO. The lead then travels up the food chain and, eventually, enters the broader environment. *See* De Francisco et al., *supra*, at 3–6; Pain et al., *supra*, at 940 (describing lead poisoning in mammalian scavengers and predators).

And where, as here, there are waterways within range of the shot, water carries lead downstream to interconnected waterways and sources of drinking water. Lead shot is small. The typical size 8 pellet weighs less than 1/400 of an ounce. *See, e.g.*, *Shotshell Science*, Fed. Premium, https://bit.ly/3UtBp8d (last visited May 6, 2024). Flowing water and stormwater runoff can easily push such small, round pellets over significant distances. *See* U.S. Environmental Protection Agency, *Best Management Practices for Lead at Outdoor Shooting Ranges*, at I-2–I-3. (June 2005), https://bit.ly/4b3d4gl ("EPA BMPs") ("Lead bullets, bullet particles or dissolved lead can be moved by storm water runoff"). Lead shot is also soft. That means not all pellets maintain their structural integrity once fired. Instead, "significant quantities of fine particulate lead" are peeled off from the pellets by the force of the blast, the collision of the pellets in the barrel, and the impact of the pellets with the ground or a berm. James R. Craig et al., *Lead Distribution on a Public Shotgun Range*, 41 Env't Geology 873, 881 (2002), https://bit.ly/3UIidop. Lead dust could then disperse through the air settling over a wide area. Because of its relatively large surface area, particulate lead also dissolves more quickly in rain and groundwater than the pellets. *Id.*; *see also* Donald W. Hardison et al., *Lead Contamination in Shooting Range Soils from Abrasion of Lead Bullets and Subsequent Weathering*, 328 Sci. of the Total Env't 175, 183 (2004), https://bit.ly/4aa83kS (noting that fine lead is "rapidly" converted to lead minerals that "may pose a risk to groundwater"). And that lead-contaminated water may then flow through and from the range, carrying the dissolved lead into ground and surface water resources. *See, e.g.*, EPA BMPs, *supra*, at I-2–I-3 ("Dissolved lead can migrate through soils to groundwater."); De Francisco et al., *supra*, at 4 ("lead particles can reach other areas due to erosion or to runoff"); Jane Houlihan & Richard Wiles, *Lead Pollution at Outdoor Firing Ranges*, Env't Working Grp. (Apr. 30, 2001), https://bit.ly/4bqEZXv ("[T]he nation's firing ranges represent a major potential source of lead in

water and wildlife, and a potential liability to nearby property owners who may find themselves living next to a hazardous waste site or who might be victims of lead drifting onto their property.").

Additionally, "lead particles do not naturally biodegrade in soil as do some contaminants." Mark A. S. Laidlaw et al., *Lead Exposure at Firing Ranges—A Review*, Env't Health 16, 17 (2017), https://bit.ly/3y36eZR. So if not properly remediated or reduced, "lead contaminated surfaces can result in lead exposures for *hundreds of years*." *Id.* (emphasis added).

Given these risks, scientists have long called for the reduction or elimination of lead-based ammunition. *See, e.g.*, Robert Byrne, *Review of the Legal and Regulatory History of Lead in Hunting*, Wildlife Soc. Bulletin, June 2023, at 2–4, https://bit.ly/3Ww7FKu; *Health Risks from Lead-Based Ammunition in the Environment: A Consensus Statement of Scientists* (Mar. 22, 2013), https://bit.ly/3JK9rjl (signed by 30 scientists). Lawmakers have considered the hazard significant enough to demand intervention despite the opposition of entrenched hunting, sporting, and manufacturing interests. For example, the federal government prohibited hunting waterfowl with lead shot to reduce the incidence of lead poisoning in those animal populations, despite fierce opposition from some hunters and manufacturers. *See* Byrne, *supra*, at 3. In 2019, the California legislature entirely prohibited the use of lead ammunition while hunting. *See id.* at 5. And the New York legislature is currently considering a bill that would prohibit using lead ammunition on state game lands or within land contributing to the New York City water supply. *See* S. Bill S4976A, 2023 Leg., Reg. Sess. (N.Y. 2023), https://bit.ly/3xW68mv.

III. The Club's Use Of Lead Shot On Its Range Poses Health And Environmental Harms.

This Court cannot ignore the science—or the undeniable impact that the Club's shooting activities have on the environment. The Club's trap range (which is co-located on its golf course driving range, *see* Complaint ¶ 65) increases the risk that Chester County wildlife and current and future residents will be exposed to significant lead contamination. That irreparable injury favors

granting the Plaintiffs' injunction. At the least, the risk of lead contamination justifies denying the Club's motion for judgment on the pleadings and setting this case for trial.

First, the Club's use of lead shot poses acute risks to Chester County wildlife. The Club's trap range sits in the middle of its golf course on the driving range, along a stream and adjacent to a woodlot and several water hazards. *See* Complaint ¶¶ 15, 65 & Exhibit A at 1–2. And the pleadings explain that the lead shot from the Club's trap shooting activities reaches that stream—which, in turn, feeds into Waynesborough Run, Crum Creek, and eventually the Springton Reservoir. *See id.* ¶ 68 & Exhibit D (demonstrating that the "shot fall zone" for the Club's trap shooting activities would include the stream under acceptable trap shooting standards, including those established by the National Rifle Association and the Amateur Trapshooting Association). The Club's environment attracts waterfowl and other birds. A golf course provides them predator-free fields in which to graze, surface water on which to rest, and woodlands in which to retreat. Unfortunately, the trap range also provides those birds with a constantly replenished supply of lead pellets to eat and stock their gizzards. And once that lead is consumed, the resident and migrating bird populations can suffer lead poisoning, die, and spread the lead they absorbed into the Chester County food chain. *See supra* Section II. If the shooting continues, wildlife mortality is likely to rise as well. *See* De Francisco et al., *supra*, at 3–6; *see also* EPA BMPs, *supra*, at III-8 (instructing ranges to "[a]void vegetation that attracts birds and other wildlife to prevent potential ingestion of lead by wildlife"); Pennsylvania Department of Environmental Protection, Bureau of Environmental Cleanup and Brownfields, *Best Management Practices for Lead at Outdoor Ranges*, Sept. 5, 2015, https://bit.ly/4a7z3kS ("Pa. BMPs") (recommending the "[e]limination of features which may attract wildlife to contaminated shot areas").

This is especially troubling, given where the Club's trap range is located. To further its bird conservation efforts, the National Audubon Society designates certain "essential habitat[s]" as "Important Bird Areas" in need of special protection. *Important Bird Areas*, Nat'l Audubon Soc., https://bit.ly/3JHPqKq (last visited May 6, 2024). The Club lies within the Upper Ridley/Crum Important Bird Area. *See Explore Important Bird Areas*, Nat'l Audubon Soc., https://bit.ly/3UJZetA (last visited May 6, 2024). Thus, the Club's trap range is introducing a fatal toxin into an ecosystem that the world's premier bird-conservation organization has designated as essential to protect.

Second, the lead contaminates the groundwater on which local residents rely. Most of the neighboring residents draw water from wells located on their properties. Complaint ¶ 74. Rain will dissolve lead off the pellets and "fine particulate lead" deposited on the range by the shooters. *See* Craig et al., *supra*, at 881; Houlihan & Wiles, *supra*, at 4. That rain will then cause the affected stormwater to leach lead until it reaches groundwater. And so long as there is lead on the ground, there is a risk that the lead-contaminated soil will introduce lead into the groundwater. *See* EPA BMPs, *supra*, at I-2 ("Dissolved lead can migrate through soils to groundwater."); Hardison et al., *supra*, at 183 (noting "risk [of] groundwater contamination in shooting range soils"). As a result, nearby residents may end up piping lead contamination into their homes with each turn of the faucet knob.

Third, the lead contaminates surface water that will then flow miles from the Club. The Pennsylvania Department of Environmental Protection has *specifically advised* that "[r]outine shooting (shot drop areas) *should not occur over streams*" and other surface water resources. Pa. BMPs, *supra* (emphasis added). Yet a stream flows directly through the impact area at a range of about 600 feet from the shooting position, cutting across the trap range well inside the bounds of

the shot fall zone areas recommended by the relevant governing bodies. *See* Complaint Exhibits A & D; *id.* ¶ 67 (stream "600 feet" from point of discharge). Shot of the size typically used for trap shooting can carry over 600 feet when shot at an upward angle, which is normal in trap shooting. *See Shotshell Ballistics for 7 ½, 8, & 9 Shot· Maximum Distance, Angle, and Height of Travel*, Nat'l Rifle Ass'n, https://bit.ly/3wmvCsW (last visited May 6, 2024) (placing max range for 7 ½ shot at 664 feet and max range for 8 shot at 632 feet). Some of the lead shot and fine particulate matter will thus inevitably fall into the stream, especially given that the stream appears to cut across the range downhill from the point at which the trap shooters are shooting the lead shot. *See* Complaint Exhibit A. And just as flowing water will dissolve lead off the surface of a lead pipe, *see, e g.*, *Lead in Drinking Water from Household Plumbing*, City of Raleigh (Feb. 1, 2023), https://bit.ly/3JKUCxd (lead particles may dissolve within "several hours"), flowing stream water will dissolve lead off submerged shot. The wildlife that depends on that stream will suffer.

So too will many humans. The stream running through the trap shooting range flows into a neighboring property and converges with Waynesborough Run, which flows through several of the neighboring properties, many of which get their water from on-lot drinking wells. Complaint ¶ 68. From there, the water flows into Crum Creek, which also supplies groundwater for residential wells. *Id.* And Crum Creek flows into Springton Reservoir, which supplies drinking water to communities throughout the region. *See, e.g.*, Pa. Nat. Heritage Program, *Crum Creek Floodplain and Reservoir* at 1–2 (2011), https://bit.ly/4b5glff; CRC Watersheds Ass'n, *Crum Creek Watershed*, https://bit.ly/3JNjgwS (last visited May 6, 2024). In other words, lead fired at the Club's range could eventually contaminate drinking water located many miles away, merely through the natural process of dilution and water flow. Not only do these harms pose an intolerable risk to the environment, local wildlife, and the health of the Club's neighbors, but they also appear

to violate the Club's mortgage covenants with its lender. *See* Complaint ¶ 73 ("Defendant's mortgage agreements with WSFS . . . explicitly 'prohibit the use, generation, manufacture, storage, treatment, disposal, release or threatened release of any Hazardous Substances' on the Country Club's Property.").

Finally, even if the Club has a system in place to try to mitigate the deleterious effect of lead, the typical mitigation options would not address the concerns here. For example, the Club might try to reclaim at least some lead pellets from the soil through raking, screening, vacuuming, or soil washing. *See* EPA BMPs, *supra*, at III-11–III-15. But lead reclamation is expensive, *see, e.g.*, *id* at III-13, and ranges typically do not rake, screen, vacuum, or soil wash after every shooting event. Indeed, they might only do so once every few years. *See* Zach Snow, *Outdoor Range Lead Reclamation—A Process that Can Pay Dividends*, Nat'l Shooting Sports Found. (Oct. 24, 2018), https://bit.ly/3ws1bBB. Thus, lead pellets will lie on the ground for at least weeks or months (or longer) before any reclamation effort is made. In that time, some lead pellets will be consumed by birds or carried off by water into the broader environment, with a portion of the lead pellets embedded into the grass and soft soil of the trap range, eventually leaching into the groundwater. Moreover, reclamation efforts are no panacea. Even professional lead reclamation companies claim to recover only 75% to 95% of the lead in the soil. *See* EPA BMPs, *supra*, at III-13. In other words, hundreds of pounds of lead pellets might remain in the soil at the end of each season even *after* reclamation. *See* Complaint ¶¶ 71 (estimating 225 pounds of lead discharge per afternoon shooting event at the Club). This is because the lead discharge is the result of no less than 3,600 shots during a typical afternoon event at the Club, with each number-8 shotgun shell containing approximately one ounce of lead and over 400 lead pellets. *Id.* ¶¶ 71–72. This translates to well over a million lead pellets contaminating the soil, streams, and groundwater per

event. *Id.* ¶ 72.[1] Consequently, with a trap shooting season running several months, there is no feasible way reclamation efforts would eliminate the Club's environmental damage.

Likewise, the spreading of lime over the ground, *see* EPA BMPs, *supra*, at III-5–III-6, is only a half-measure that cannot eliminate all the harm caused by environmental lead poisoning. Lime does not stop waterfowl and other birds from consuming lead pellets, nor does it reduce a pellet's toxicity once consumed. Further, lime does not neutralize lead pellets that fall or flow into the stream that runs through the trap range. And lime does not completely stop the lead from dissolving into surface and groundwater. The risk of contamination therefore remains despite these potential mitigation efforts.

* * *

Lead is a poison. And the Club's shooting activities are dispersing significant quantities of that poison into the stream and local ecosystem within the trap range—which, in turn, infects animals, groundwater, and surface water sources with widespread downstream impact. According to the relevant science, natural forces, wildlife, and waterflow carry that poison out of the trap range and into the surrounding environment. Thus, the residents who live around the Club are right to be worried about the risks. This Court should not permit the Club's lead-based nuisance to persist.

CONCLUSION

For the reasons explained in this brief, and for the reasons argued by the Plaintiffs, *amici* respectfully urge this Court to deny the Defendant's motion for judgment on the pleadings and to grant the injunctive relief requested in Plaintiffs' pleadings.

[1] 3,600 shots x 400 lead pellets per shot = 1.44 million lead pellets

Respectfully Submitted,

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