



5 IS THE NEW 15:

A Case for Reducing the Action Level for Lead in New York State's Public School Drinking Water Program from 15 parts per billion (ppb) to 5 ppb

OVERVIEW

Lead is a poisonous heavy metal that can affect almost every organ and system in the human body, often with irreversible effects. Even at very low levels, lead can cause serious damage to the developing brains and nervous systems of babies and young children, who are most susceptible to these adverse effects.¹ Lead poisoning can decrease a child's cognitive capacity, cause behavioral problems, and limit their ability to concentrate — all of which affect their learning potential in school.² Children with these brain impacts are less likely to graduate from high school and more prone to delinquency, teen pregnancy, violent crime, and incarceration.³

LEAD'S IMPACT ON CHILDREN'S HEALTH



BRAIN

Impairs cell growth and restricts brain development



BEHAVIOR

Causes ADHD and hyperirritability



LEARNING

Difficulties with learning, focus and retention of information



HEART

Inhibits ability to make hemoglobin, causing anemia and high blood pressure later in life



BONES

Hinders bone development



STOMACH

Intense stomach pain and kidney inflammation

Children spend much of their time in school facilities, receiving most of their water intake from school fountains and sinks.⁴ This makes any level of lead in school drinking water of particular concern. Many buildings that house daycare facilities have older plumbing fixtures, fittings, pipes, and solder that contain high amounts of lead, which can leach into drinking water. The Environmental Protection Agency (EPA) estimates that drinking water can account for 20 percent or more of a person's total exposure to lead which is why reducing all points of contact — especially in schools— is critical.⁵

The EPA regulates lead in public drinking water under a set of regulations called the “Lead and Copper Rule.” Among other requirements, the rule relies on an “action level” that triggers remediation by local authorities. The action level, established by the EPA in 1991, is 15 parts per billion (ppb). According to the EPA, the lead action level is not a health-based number but a technical feasibility standard used “to measure the effectiveness of the corrosion control treatment in water systems.”⁶ Given that the EPA advises that there is no safe level of lead⁷ and that the Lead and Copper Rule applies to public drinking water supplies and not levels in school buildings, states can and should set more protective drinking water standards.

GOVERNMENTAL ACTION ACROSS THE COUNTRY AND GLOBE SINCE 2016

There is growing recognition among public health advocates that an action level of 15 ppb is outdated and that a lower level should be set.¹¹ Evidence suggests that lead levels below 15 ppb limits can be harmful, especially when the population consists primarily of children.¹² The American Academy of Pediatrics (AAP) recommends that lead concentrations in school drinking water should be less than 1 ppb.¹³ When comparing the EPA standard to the AAP recommendation, there is clearly room for improvement.

Lowering the level from 15 ppb to 5 ppb – in alignment with the Food and Drug Administration's criteria for what is acceptable in bottled water¹⁴ – appears to be gaining acceptance as a feasible standard to achieve from a regulatory and technical standpoint. As of late, both global and local governments have lowered their action levels to 5 ppb. In March 2019, Canada established a 5 ppb standard,¹⁵ following a 2018 European Union directive recommending that maximum lead levels in drinking water be dropped from 10 to 5 ppb.¹⁶

In February 2020, the joint committee governing the American National Standards for the National Sanitation Foundation (NSF) and the American National Standards Institute (ANSI) lowered the maximum allowable concentration of lead in treated drinking water to 5 ppb.¹⁷ Domestically, states such as Illinois¹⁸, Montana¹⁹, and the District of Columbia²⁰ have adjusted their action levels accordingly. The State of Vermont leads the nation's efforts, mandating a 4 ppb maximum for lead exposure.²¹

MEASURING THE IMPACT OF LOWERING NEW YORK STATE'S ACTION LEVEL TO 5 PPB

In order to understand the impact that lowering New York State's action level from 15 ppb to 5 ppb would have, NYLCVEF volunteer researchers collected and analyzed thousands of lab reports from nearly 90% of all New York State school districts containing data from the 2016 initial round of testing. The data collection and inputting process took nearly two years with assistance from several dozen volunteer researchers who cumulatively spent hundreds of hours reading thousands of pages of lab reports.

According to the 2016 New York State Health Department data, 47,887 outlets, or 12%, reported elevated lead concentrations.²² Reviewing the available data available to NYLCVEF researchers identified an additional 63,428 outlets that tested between 5 ppb and 15 ppb, representing 17.2% of additional outlets currently in use that would be in need of remediation under a more protective standard.

OUTLETS REPORTED IN 2016 BY NEW YORK STATE ABOVE 15 PPB THAT WERE REMEDIATED ²²	OUTLETS IDENTIFIED BY NYLCVEF BETWEEN 5 PPB -15 PPB IN NEED OF REMEDIATION UNDER THIS MORE PROTECTIVE STANDARD ²³
47,887	63,428
12.03% Statewide	17.2% Statewide

ECONOMIC ANALYSIS

Understanding the scope of the problem in economic terms is critical for future planning by lawmakers. NYLCVEF enlisted support from a graduate school team of researchers from Columbia University's School for Professional Studies to estimate the remediation costs associated with lowering the action level to 5 ppb. The researchers first identified the distribution of 63,428 outlets to determine which were faucets or fountains.²⁴ The estimates they generated were then based on 2016-2019 actual expenses for outlet type (i.e., faucet or fountain) and location (i.e., NYC versus Non-NYC).²⁵

Of note, the cost differential between remediating a faucet or fountain in New York City versus a Non-New York City district varied greatly. For example, the 2016-19 replacement cost for a faucet in a New York City school was \$1,688, versus \$173 in a non-New York City School. The replacement cost for a fountain in a New York City school was \$1,505, versus \$668 in a non-New York City School.

Even though 63,428 outlets were found between 5 ppb – 15 ppb, which represented an increase of 32% from the 47,877 outlets found above 15 ppb, the actual cost increase is estimated as closer to only 9%. This is accounted for by the distribution of the outlet type and its location compared to outlets above 15 ppb.²⁶

MEASURING COSTS

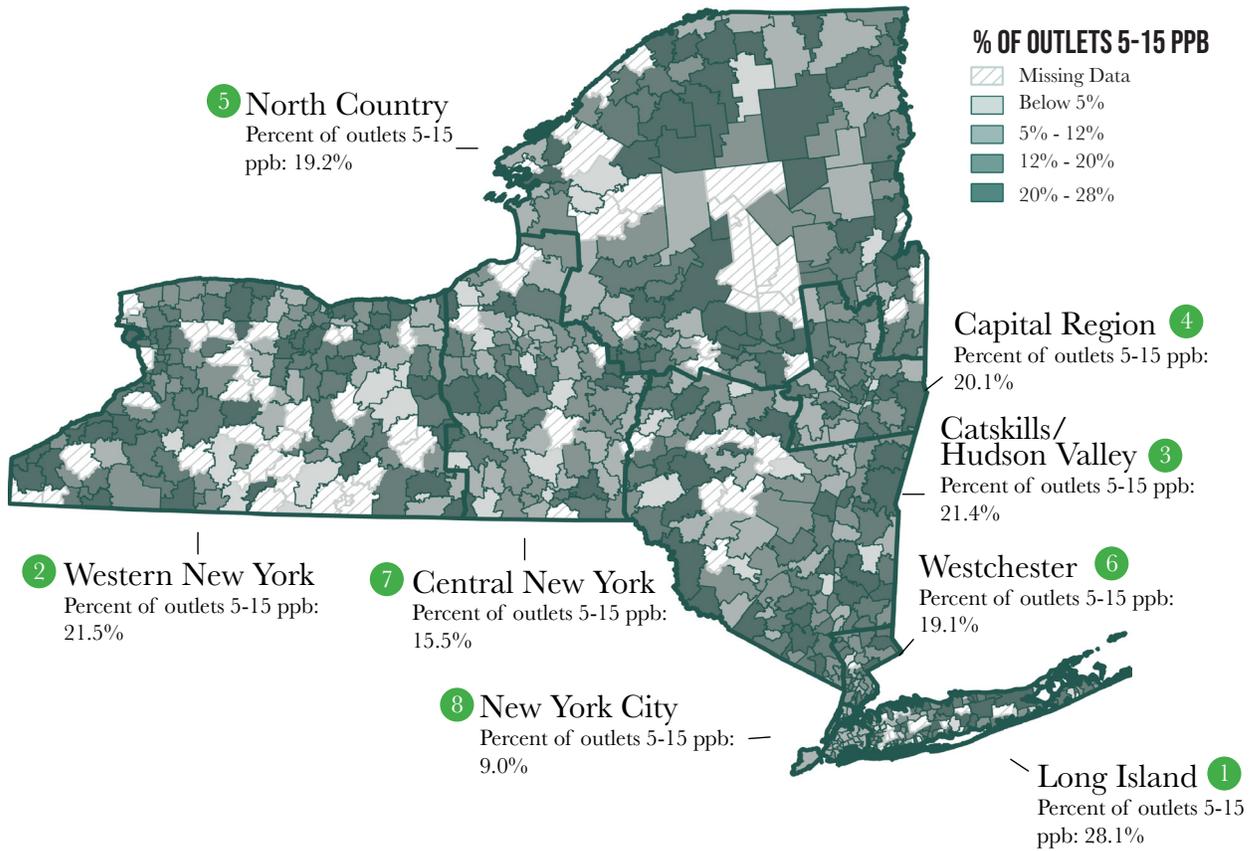
ACTUAL FAUCET AND FOUNTAIN REPLACEMENT COST FOR 47,877 OUTLETS ABOVE 15 PPB (FUNDS PREVIOUSLY ALLOCATED)	\$27,814,514
ESTIMATED FAUCET AND FOUNTAIN REPLACEMENT COST FOR 63,428 OUTLETS BETWEEN 5 - 15 PPB (FUTURE FUNDS NEEDED)	\$30,273,020

DATA VISUALIZATION

In order to understand the distribution of the concern around New York State, NYLCVEF visualized its data into maps with geographical and political subdivisions.

Using the 17.2% statewide average of outlets between 5 ppb – 15 ppb that would require remediation, the data was distributed according to the following filters:

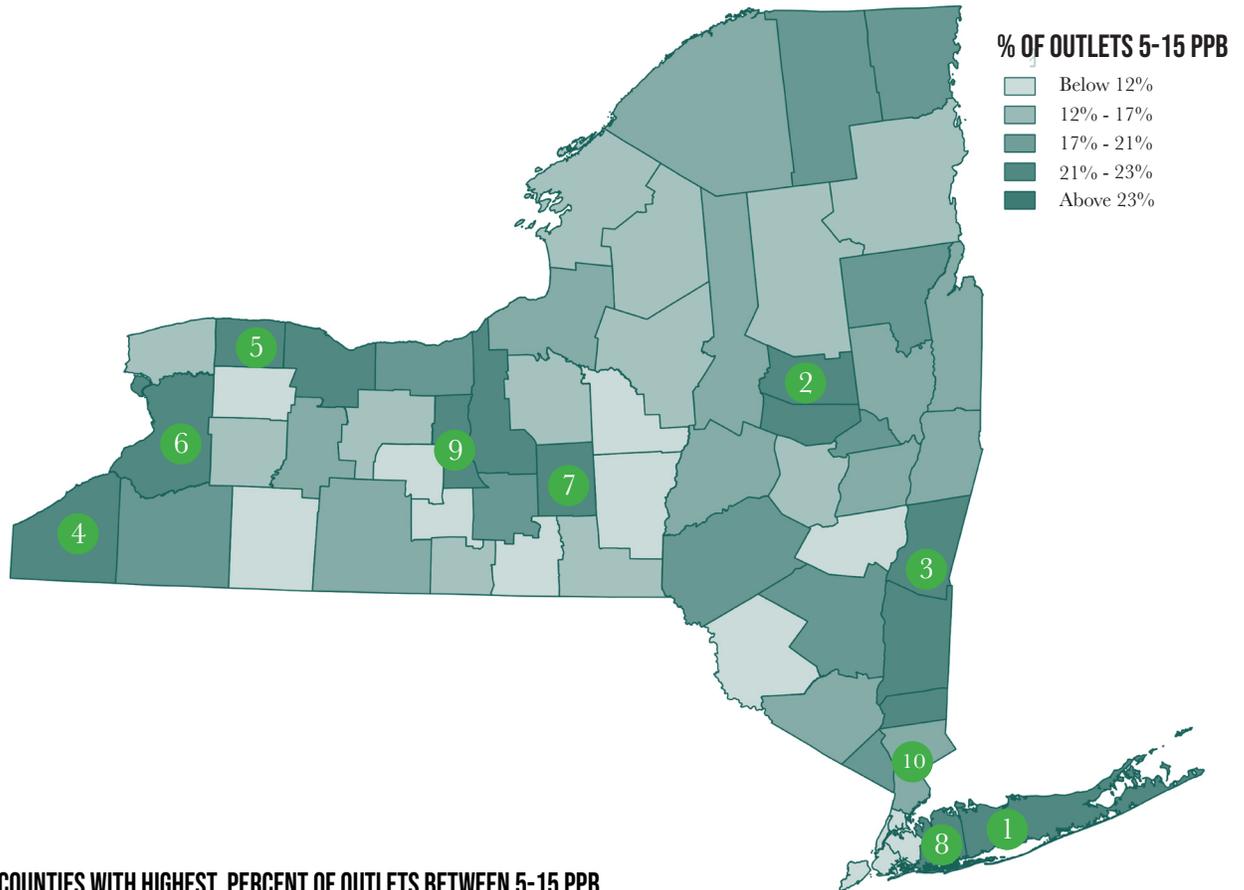
NYS PUBLIC SCHOOL DISTRICTS OF CONCERN BY REGION



REGIONS WITH HIGHEST PERCENTAGE OF OUTLETS BETWEEN 5 - 15 PPB



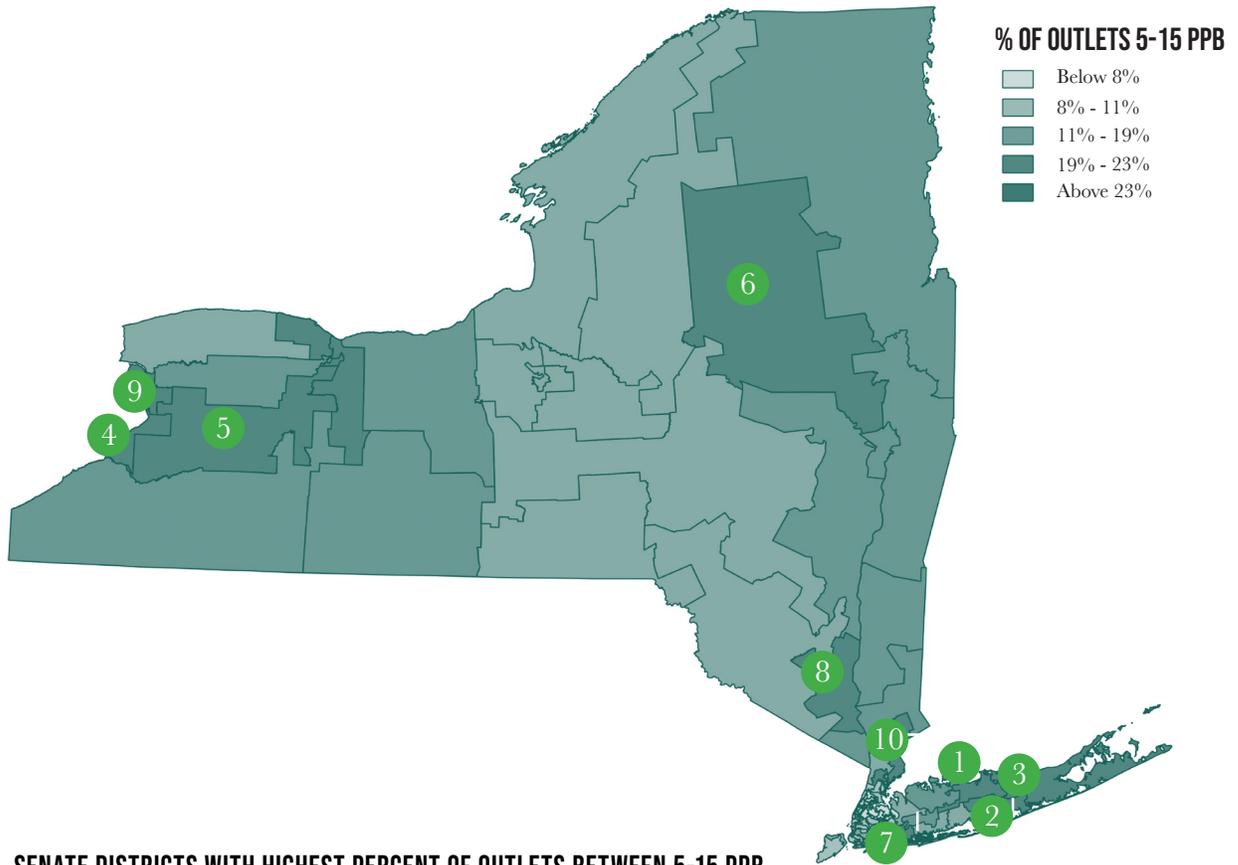
NYS PUBLIC SCHOOL DISTRICTS OF CONCERN BY COUNTY



COUNTIES WITH HIGHEST PERCENT OF OUTLETS BETWEEN 5-15 PPB

1	Suffolk	30.3
2	Fulton	30.1
3	Columbia	28.1
4	Chautauqua	27.6
5	Erie	27.1
6	Orleans	27.1
7	Cortland	26.5
8	Nassau	24.9
9	Seneca	24.8
10	Putnam	24.0
	New York State	17.2

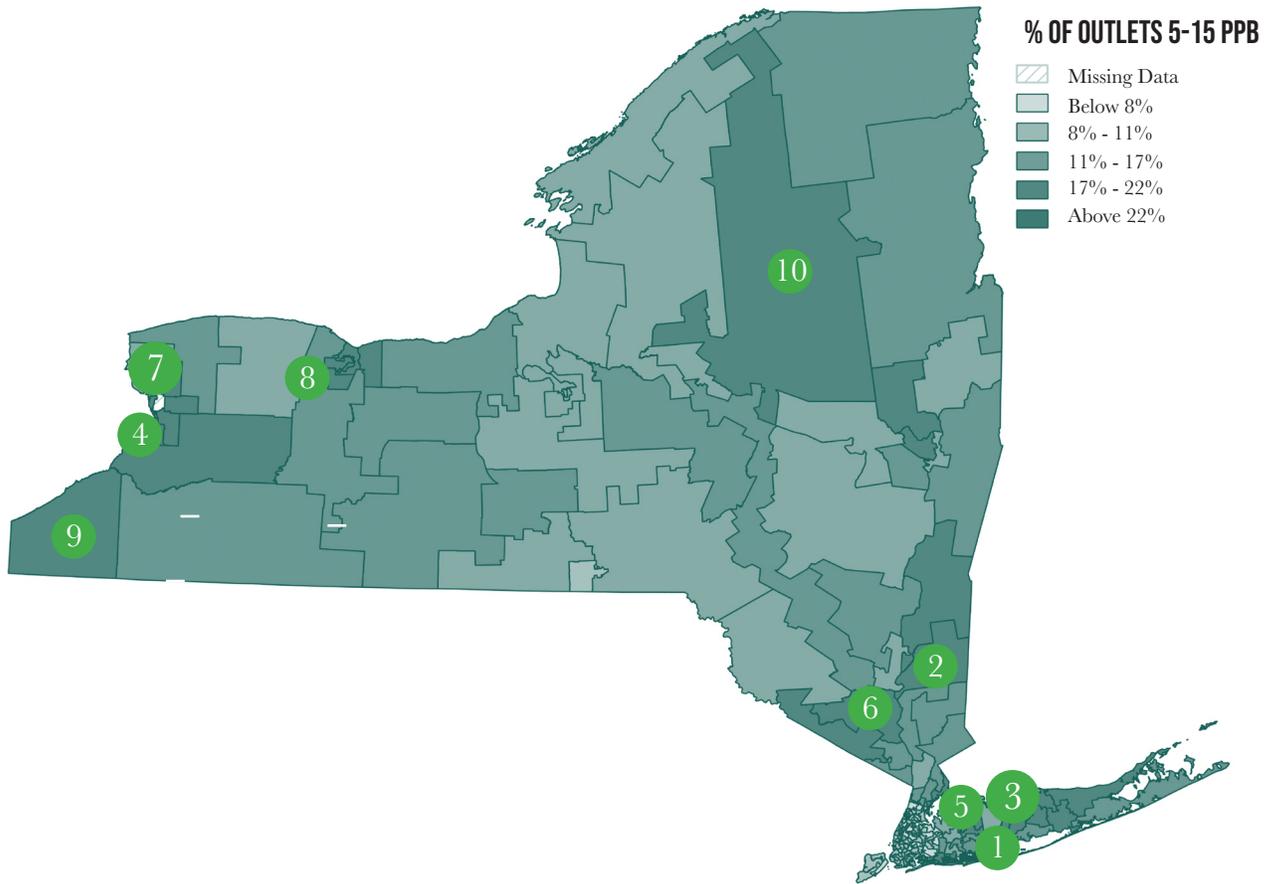
NYS PUBLIC SCHOOL DISTRICTS OF CONCERN BY SENATE DISTRICT



SENATE DISTRICTS WITH HIGHEST PERCENT OF OUTLETS BETWEEN 5-15 PPB

1	District 2 - Senator Mattera	30.6
2	District 3 - Senator Weik	26.7
3	District 1 - Senator Palumbo	25.3
4	District 60 - Senator Ryan	25.3
5	District 59 - Senator Gallivan	25.1
6	District 49 - Senator Tedisco	25.1
7	District 9 - Senator Kaminsky	25.0
8	District 39 - Senator Skoufis	23.9
9	District 63 - Senator Kennedy	23.4
10	District 37 - Senator Mayer	23.3
	New York State	17.2

NYS PUBLIC SCHOOL DISTRICTS OF CONCERN BY ASSEMBLY DISTRICT



ASSEMBLY DISTRICTS WITH HIGHEST PERCENT OF OUTLETS BETWEEN 5-15 PPB

1	District 6 - Assemblymember Ramos	46.4
2	District 105 - Assemblymember Lalor	33.1
3	District 8 - Assemblymember Fitzpatrick	31.3
4	District 149 - Assemblymember Rivera	30.8
5	District 15 - Assemblymember Montesano	28.8
6	District 99 - Assemblymember Schmitt	28.3
7	District 146 - Assemblymember McMahon	28.2
8	District 138 - Assemblymember Bronson	28.0
9	District 150 - Assemblymember Goodell	27.9
10	District 118 - Assemblymember Smullen	27.6
	New York State	17.2

BY SCHOOL DISTRICT

The following thirty school districts were found to have more than 50% of outlets with levels between 5 ppb – 15 ppb:

SCHOOL DISTRICT	PERCENT OF OUTLETS 5PPB -15 PPB	COUNTY	REGION
Hamilton Central School District	90.0%	Madison	Central New York
Long Beach City School District	88.5%	Nassau	Long Island
Taconic Hills Central School District	88.2%	Columbia	Catskills/Hudson Valley
Valley Stream Central High School District	88.1%	Nassau	Long Island
Dolgeville Central School District	85.1%	Herkimer	North Country
Williamsville Central School District	81.1%	Erie	Western New York
Saranac Lake Central School District	79.1%	Franklin	North Country
Schenevus Central School District	77.8%	Otsego	Central New York
Hamburg Central School District	73.3%	Erie	Western New York
Edwards-Knox Central School District	69.8%	Suffolk	Long Island
Sachem Central School District	69.8%	St Lawrence	North Country
Oysterponds Union Free School District	69.6%	Suffolk	Long Island
Hicksville Union Free School District	69.3%	Nassau	Long Island
Letchworth Central School District	67.6%	Wyoming	Western New York
Colton Pierrepont Central School District	62.5%	St Lawrence	North Country
East Bloomfield Central School District	61.0%	Ontario	Western New York
Wheatland Chili Central School District	60.4%	Monroe	Western New York
Kiryas Joel Village Union Free School District	59.2%	Orange	Catskills/Hudson Valley
Tully Central School District	57.3%	Onondaga	Central New York
Southern Cayuga Central School District	56.8%	Cayuga	Central New York
Elmsford Union Free School District	56.7%	Westchester	Westchester
North Bellmore Union Free School District	56.5%	Nassau	Long Island
Brasher Falls Central School District	55.2%	St Lawrence	North Country
Romulus Central School District	52.6%	Seneca	Western New York
Brentwood Union Free School District	52.3%	Suffolk	Long Island
Voorheesville Central School District	52.2%	Albany	Capital Region
East Irondequoit Central School District	51.4%	Monroe	Western New York
Harrisville Central School District	51.2%	Lewis	North Country
Sherman Central School District	57.8%	Chautauqua	Western New York
Gowanda Central School District	50.4%	Cattaraugus	Western New York

CONCLUSION

In order for New York State to keep pace with the progress being made by other governments, it too should consider lowering its action level to 5 ppb. Fortunately, New York State is one of five states, including Massachusetts, Washington, Michigan, and Pennsylvania, where the legislature has proposed to lower its action level to 5 ppb. Legislation was introduced in the state Assembly (A. 160 – Gottfried) and Senate (S. 2122 – Rivera) in January 2020.²⁷ **This bill would improve the 2016 program by, among other things, lowering the action level to 5 ppb and testing water annually.**

By improving New York State's 2016 mandate for schools to reduce lead in drinking water, federal inaction regarding this issue will be corrected once again. Not only would New York State be aligned with other government leaders in public school drinking water safety, such as Illinois, Washington DC, and Vermont, it would once again be a national leader as the largest state with the lowest action level.

Lowering New York State's action level to 5 ppb would represent a large public health gain — 17.2% additional outlets remediated in addition to the 12% remediated after 2016 testing. Achieving this milestone would show great progress in public health protections by ensuring that nearly 70% of all public school drinking water would be under 5 ppb.

Even though a lowered action level of 5 ppb will qualify more outlets for remediation than in 2016, it will be less expensive to achieve due to the location and modeling of current outlets. Such remediation will undeniably reap an excellent return on investment for the health of public school children across the state.

Due to the global COVID-19 pandemic, New York State has temporarily suspended the regulatory requirement that public schools collect and test water samples for toxins during 2020. According to a September 9, 2020 memo from the NYS Department of Health,

“ On April 3, 2020, the NYSDOH issued guidance to all schools required to conduct lead testing in drinking water under Subpart 67-4 to discontinue lead testing of drinking water while a school is closed in response to COVID-19, and that sampling should be conducted upon resuming normal operating conditions. We have received many inquiries from schools and their consultants since then, expressing their concerns about not being able to complete the required monitoring before the end of the compliance period, December 31, 2020. The Department is currently reviewing the regulation to determine if an extension of the compliance period can be granted due to the COVID-19 impact on schools.”

Many schools are not in session during the current school year, which presents the governor and the legislature with a chance to consider investments in the FY 21-22 budget to address health and safety concerns in public schools. **While exposure to lead in public school drinking water will not be a major consideration until normal operating conditions resume, prioritizing a lowered action level of 5 ppb now will improve the environment of schools in the future.**

- 1 Centers for Disease Control and Prevention, Advisory Committee on Childhood Lead Poisoning Prevention, “Low-Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention,” 2012, www.cdc.gov/nceh/lead/acclpp/final_document_030712.pdf.
- 2 Ibid.
- 3 Ibid; see also J.P. Wright et al., “Association of Prenatal and Childhood Blood Lead Concentrations with Criminal Arrests in Early Adulthood,” *PLoS Med.* 5, no. 5 (May 27, 2008): 2008: e101, www.ncbi.nlm.nih.gov/pmc/articles/PMC2689664/; S.D. Lane et al., “Environmental Injustice: Childhood Lead Poisoning, Teen Pregnancy, and Tobacco,” *J Adolesc Health* 42, no. 1 (Jan. 2008):43-9.; R. Nevin, “How Lead Exposure Relates to Temporal Changes in IQ, Violent Crime, and Unwed Pregnancy,” *Environ Res.* 83, no. 1 (May 2000):1-22; R. Levin, “Reducing Lead in Drinking Water,” U.S. Environmental Protection Agency, 1986, <https://nepis.epa.gov/Exe/ZyPDF.cgi/2000911C.PDF?Dockey=2000911C.PDF>.
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- 5 Ibid.
- 6 USEPA, Understanding the Lead and Copper Rule, https://www.epa.gov/sites/production/files/2019-10/documents/lcr101_fact-sheet_10.9.19.final_2.pdf
- 7 USEPA, General Information about Lead in Drinking Water, <https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water>.
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- 9 NYS Department of Health, Health Data NY, <https://health.data.ny.gov/Health/Lead-Testing-in-School-Drinking-Water-Sampling-and/rkyy-fsv9>
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- 12 National Toxicology Program, U.S. Department of Health and Human Services. “Health Effects of Low-Level Lead” June 2012 https://ntp.niehs.nih.gov/ntp/ohat/lead/final/monographhealtheffectslowlevellead_newissn_508.pdf
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- 14 Food and Drug Administration, “Bottled Water Everywhere: Keeping it Safe”, <https://www.fda.gov/consumers/consumer-updates/bottled-water-everywhere-keeping-it-safe>
- 15 Health Canada. Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Lead. March 2019. Available at <https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-drinking-water-quality-guideline-technical-document-lead/guidance-document.html#a1>.
- 16 European Commission. Proposal for a directive of the European Parliament and of the Council on the quality of water intended for human consumption, 2018. https://ec.europa.eu/environment/water/water-drink/pdf/revised_drinking_water_directive.pdf
- 17 National Sanitation Foundation, “Drinking Water Treatment Units Must Now Meet Stricter Requirements for Lead Reduction Certification”, February 2020, <https://www.nsf.org/news/drinking-water-treatment-units-stricter-requirements-lead-reduction-cert>
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- 19 <http://www.mtrules.org/gateway/ShowNoticeFile.asp?TID=9609>
- 20 Washington DC Public Schools, “Water Testing for Lead,” <https://dcps.dc.gov/page/water-testing-lead>
- 21 Vermont Department of Health, “Lead in Drinking Water in Schools,” <https://www.healthvermont.gov/environment/school/lead-drinking-water-schools>
- 22 NYC Department of Education, Water Safety, <https://www.schools.nyc.gov/docs/default-source/default-document-library/2017-nyc-doe-water-test-results>; NYS Department of Health, Health Data NY, <https://health.data.ny.gov/Health/Lead-Testing-in-School-Drinking-Water-Sampling-and/rkyy-fsv9>
- 23 NYLCVEF analysis of available data from 89% of all public school districts which were accessed via the school website or FOIL request.
- 24 Per NYLCVEF analysis of the empirical data, faucets and fountains represent 98.5% of the outlets remediated statewide. The other 1.5% included hose bibs, ice makers, slop sinks, kitchen steamers, and water bottle filling machines.
- 25 Schedule W – State Aid Management System (SAMS) for fiscal years 2016-17, 2017-2018, 2018-19, NYS State Department of Education <https://stateaid.nysed.gov/sams>
- 26 This can mostly be attributed to the distribution of faucets versus fountains, where they were found, and the cost of remediation. See Appendix
- 27 New York State Assembly legislation, <https://assembly.state.ny.us/leg/?bn=A0160&term=2021>

APPENDIX

ACTUAL COSTS FOR REPLACING FAUCETS AND FOUNTAINS AT AN ACTION LEVEL ABOVE 15 PPB						
	Number of faucets replaced	Average cost of faucet replacement (purchase and installation)	Actual cost of replacing faucets	Number of fountains replaced	Average cost of replacing fountains (purchase and installation)	Actual cost of replacing fountains
NYC	7,636	\$1,688	\$12,891,656	6,000	\$1,505	\$9,030,402
NON-NYC	20,600	\$173	\$3,573,072	3,474	\$668	\$2,319,384
TOTAL	28,236		\$16,464,728	9,474		\$11,349,786
Actual Faucet and Fountain Replacement Cost:						\$27,814,514

Source Data: NY State Education Department Schedule W Water Testing and Remediation Aid (WTR) as of November 27, 2018

ESTIMATED COSTS FOR REPLACING FAUCETS AND FOUNTAINS AT AN ACTION LEVEL BETWEEN 5 PPB AND 15 PPB						
	# of faucets identified between 5ppb - 15 ppb	Average cost of faucet replacement (purchase and installation)	Estimated cost	# fountains identified between 5ppb - 15 ppb	Average cost of replacing fountains (purchase and installation)	Estimated cost
NYC	9,095	\$1,688	\$15,354,816	1,873	\$1,505	\$2,818,996
NON-NYC	45,260	\$173	\$7,850,347	6,364	\$668	\$4,248,861
TOTAL	54,355		\$23,205,163	8,237		\$7,067,857
Estimated Faucet and Fountain Replacement Cost:						\$30,273,020

Source Data: NYLCVEF analysis of lab reports from 89% of all public school districts.

ACKNOWLEDGMENTS

Thank you to the following individuals that lent their time and expertise to play a critical role in the development of this report:

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Funding: League of Conservation Voters Education Fund – Chemical Policy Program

Info graphics and map design: Taylor Novick-Finder



In memory of Cecil Corbin-Mark of WEACT, a tireless fighter for environmental justice and a “General” in the war against lead poisoning.

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