RIVERKEEPER
NY's clean water advocate

Testimony of Riverkeeper Including New Research on the Impacts of Road Salt on Drinking Water Quality, Especially for Environmental Justice Communities

Joint Legislative Public Hearing on the Transportation Portion of the Executive Budget Proposal for Fiscal Year 2024-2025

January 24, 2024

Riverkeeper respectfully submits this written testimony, which will cover three topics that demand the attention of legislators, relating to NYS Department of Transportation's (DOT) work affecting water quality and aquatic habitats in the Hudson River Watershed, and throughout New York State: the use of road salt, the Route 17K diversion project in Newburgh, and the use of transportation rights-of-way for renewable energy transmission.

Riverkeeper is a nearly 60-year-old non-profit membership-supported organization that protects and restores the Hudson River from source to sea and safeguards drinking water supplies, through advocacy rooted in community partnerships, science and law.

1. Road Salt

Road salt, in the form of rock salt, has been used for decades as the most commonly used de-icing agent in New York State and throughout the U.S., with use increasing markedly since the 1990s[1] and doubling since the 1970s.[2] Best management practices, including by switching to salt brine, can dramatically reduce the amount of salt required

[1] American Geosciences Institute, "Roadway Deicing in the United States," 2014, https://www.americangeosciences.org/sites/default/files/CI_Factsheet_2017_3_Deicing_170712.pdf
[2] Cary Institute, "Road Salt: The Problem, the Solution and How to Get There," 2010, revised 2020, https://www.caryinstitute.org/sites/default/files/public/downloads/report_road_salt.pdf

to produce the same safe roads, have likewise been well established for well over a decade, if not more.[3] We are confident that the dedicated highway crews that maintain our state and local roads would take the same pride in their important role in promoting road safety if they were using less salt. This could further save state taxpayers substantially, as an Adirondack Council analysis found that the state, counties, towns, villages and schools will spend between $111.0 million and $390.8 million this winter alone on road salt.

The road salt we have already applied in New York State has had significant and unappreciated impacts on water quality that affect both public health and ecological health. Without action, these impacts will continue to increase in severity.

Road Salt Impacts on Drinking Water

Riverkeeper analyzed the publicly available Annual Water Quality Reports for communities in our mission area, the Hudson River Watershed, which covers approximately 25% of the land area of New York State. According to our preliminary results, of 145 water supplies serving 2.65 million New Yorkers, ***more than half of these New York State residents have received tap water that should not be consumed by those on very low sodium diets*.** These 78 water supplies delivered water to 1.39 million New Yorkers with sodium concentrations that exceeded 20 mg/L. As each Annual Water Quality Report states – in footnotes that would be easily missed by all but the most informed readers – "Water containing more than 20 mg/L of sodium should not be used for drinking by people on severely restricted sodium diets." See the appendix for a list of communities affected.

As of 2016, an estimated 31.7% of New York State residents had been diagnosed with hypertension, or high blood pressure, one of the leading risk factors for cardiovascular disease and stroke.[4] Heart disease is the leading cause of death in New York State.[5] We do not know what percentage of New Yorkers diagnosed with hypertension are on very low sodium diets, but reducing sodium intake is the top lifestyle recommendation for all those diagnosed.[6,7]

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[3] ibid.
[4] NYS DOH, "INFORMATION FOR ACTION REPORT 2018 - 08 Percentage of adults with diagnosed hypertension, by county, New York State, BRFSS 2016," https://www.health.ny.gov/statistics/prevention/injury_prevention/information_for_action/docs/2018-08_ifa_report.pdf
[5] NYS DOH, "Leading Causes of Death, NYS 2010-2020," https://apps.health.ny.gov/public/tabvis/PHIG_Public/lcd/reports/#state
[6] International Society for Hypertension, "2020 International Society of Hypertension Global Hypertension Practice Guidelines," https://www.ahajournals.org/doi/full/10.1161/HYPERTENSIONAHA.120.15026
[7] Mayo Clinic, "High Blood Pressure (Hypertension)" https://www.mayoclinic.org/diseases-conditions/high-blood-pressure/diagnosis-treatment/drc-20373417

The scientists we have consulted suggest there is no reasonable explanation for widespread levels of high sodium in drinking water supplies other than the widespread and ongoing use of road salt, with the exception of the Hudson River Estuary, which can be influenced by saltwater from the Atlantic during prolonged droughts.

In addition to direct concerns about dietary intake of sodium, sodium chloride can change the chemistry of water, potentially leading to:

- increased leaching of lead from water distribution pipes[8];
- increased risk of other harmful metals mobilized from source waters[9];
- increased risk of Harmful Algal Blooms[10].

Road Salt in Drinking Water is an Environmental Justice Issue

As with many environmental threats, road salt's effect on drinking water appears to have a disproportionate impact on communities in New York State identified as Potential Environmental Justice Areas or Disadvantaged Communities, based on their demographics and incomes. Degradation of drinking water sources is an under-appreciated environmental justice issue, as communities downstream have limited to no power to protect their water sources in upstream communities, and therefore rely heavily on state protections that unfortunately leave important gaps. The impact of road salt is but one example.

According to Riverkeeper's preliminary data, water supplies that have exceeded the threshold for very low sodium diets disproportionately serve DEC-designated Potential Environmental Justice Areas (PEJAs) and/or Disadvantaged Communities (DACs). Of the 1.39 million people in communities that rely on drinking water from sources that have exceeded the 20 mg/L threshold, 75% serve areas that include Potential Environmental Justice Areas and/or Disadvantaged Communities.

Black Americans experience 30% higher risk of fatal stroke, 50% higher risk of cardiovascular disease mortality, more than 4 times higher risk of end-stage renal disease, and 4-5 times greater hypertension-related mortality overall when compared to non-Hispanic White Americans. Hypertension control rates are lower for Hispanic,

[8] Pieper, Kelsey J., et al. "Impact of road salt on drinking water quality and infrastructure corrosion in private wells." *Environmental science & technology* 52.24 (2018): 14078-14087.
[9] Wu, Jingjing, and Hwidong Kim. "Impacts of road salts on leaching behavior of lead contaminated soil." *Journal of hazardous materials* 324 (2017): 291-297.
[10] Hintz, William D., and Rick A. Relyea. "A review of the species, community, and ecosystem impacts of road salt salinisation in fresh waters." *Freshwater biology* 64.6 (2019): 1081-1097.

non-Hispanic Black and Asian Americans, compared to non-Hispanic White Americans.[11]

Road salt is already present at levels in public drinking water supplies that pose a risk to many New Yorkers, and

	Water Systems	Population Served	Systems serving PEJAs	PEJA Population Served	Systems Serving DACs	DAC Population served
TOTAL	145	2,653,821	80	2,067,998	73	1,486,780
> 20 mg/L sodium	78	1,390,597	46	1,046,817	38	454,141
< 20 mg/L sodium	50	1,196,582	28	991,198	31	1,008,785
No sodium data	17	66,642	6	29,983	4	23,854

Ecological Effects of Road Salt

In 2018, the leading ecologists called for action to reduce the impacts of "freshwater salinization syndrome,"[12] and have said that "widespread salinisation of freshwater ecosystems poses a major threat to the biodiversity, functioning, and services that they provide."[13] The U.S. Environmental Protection Agency has warned that "excess salts create chemical cocktails":

> Salts can corrode metals and exacerbate metal contamination in drinking water, increase nutrient and heavy metal contamination in streams and lakes, and can cause environmental stress to sensitive species. When salts mobilize heavy metals, nutrients, and radionuclides, they can create even more potent "chemical cocktails" which are mixtures of chemicals that may have synergistic toxic effects that may be difficult to treat and remove. Salts and the associated chemical

[11] National Library of Medicine, "Racial and Ethnic Disparities in Hypertension: Barriers and Opportunities to Improve Blood Pressure Control," 2023, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9838393/
[12] PNAS, "Freshwater salinization syndrome on a continental scale," 2018, https://www.pnas.org/doi/10.1073/pnas.1711234115
[13] Trends in Ecology and Evolution, "Freshwater salinisation: a research agenda for a saltier world," 2022, https://pubmed.ncbi.nlm.nih.gov/35058082/

> cocktails build up in soils, surface water, and groundwater and are not easily remediated. [14]

In New York State, Department of Environmental Conservation scientists have documented in peer-reviewed literature that road salt is the likely cause of a leading negative trend in water quality in streams statewide, including an increase in harmful algal blooms, based on 40 years of data through 2012.[15] DEC scientists wrote:

> The increased presence of chloride in NY surface waters is cause for concern because it may be limiting measurable improvements in biological condition…. [C]hloride concentrations have been increasing at base flow discharge over our period of investigation for which chloride data exist…. The steady increase in chloride concentration over time in rivers such as the Susquehanna in NY suggests that deicing salts are retained in ground waters and soils, building up and releasing over long periods…. [I]t is clear that NaCl can have negative impacts on mortality and alter ecosystem processes…. In some cases, surface water increases in chloride may exacerbate eutrophication through stimulating growth of nuisance algal blooms when other nutrients (phosphorus and nitrogen) are not limiting.

In short, road salt is a leading cause of water quality degradation in New York State, harming freshwater ecology.

Road Salt Policies

Riverkeeper urges members of the New York State Legislature to advance legislation that builds on the strongest aspects of the Adirondack Road Salt Task Force Report to improve conditions statewide. As the task force report makes clear, and our data reinforce, road salt impacts are more severe and widespread outside the Adirondack Park than within it.

Statewide road reduction policies are urgently needed, and should build on well-established best management practices and go beyond pilot studies to achieve a change in the status quo as quickly as possible.

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[14] U.S. Environmental Protection Agency, "EPA Researching the Impacts of Freshwater Salinization Symdrome," 2022, https://www.epa.gov/sciencematters/epa-researching-impacts-freshwater-salinization-syndrome

[15] River Research and Applications, "Long-term trends in biological indicators and water quality in rivers and streams of New York State (1972–2012)," 2018, https://onlinelibrary.wiley.com/doi/abs/10.1002/rra.3272

Policies should:

- require measurable reductions in road salt;
- make state agencies accountable for reductions;
- incentivize local reductions; and,
- prioritize investments in equipment and training that facilitate the implementation of best management practices.

We look forward to working with legislators to define and advance such policies this session.

2. Route 17K Stormwater Diversion Project (Newburgh)

Since the presence of PFAS contamination in City of Newburgh and Town of New Windsor drinking water came to light in 2016, investigations have commenced to define the extent of contamination at the source, the Stewart Air National Guard Base, and ultimately to define remediation measures. Riverkeeper is a leader in the "Speed Up the Cleanup" campaign to implement measures as soon as possible to reduce and eliminate the ongoing flow of PFAS-contaminated water off the base (Newburgh and New Windsor currently rely on alternative water sources, and filtered water sources.) Joining this call are U.S. Senators Chuck Schumer and Kirsten Gillibrand, U.S. Rep. Pat Ryan, NYS DEC, a coalition of non-profit organizations that include Newburgh Clean Water Project, Newburgh's NAACP branch, Hudson River Sloop Clearwater and others, and nearly 900 individuals who have signed a petition.

Key to any short or long-term remediation of PFAS at Stewart Air National Guard Base is the NYS DOT Route 17K stormwater diversion project in the Town of Newburgh. This project will divert stormwater that is currently piped under the Air National Guard Base, where it becomes contaminated with PFAS and subsequently requires treatment. By removing this flow of stormwater, the volume of PFAS-polluted water to be manged will be significantly reduced. The Air National Guard has committed to covering half the cost of this project.

Riverkeeper urges the members of the New York State Legislature to ensure that all needed NYS DOT funding is available and prioritized for expediting the Route 17K stormwater diversion project.

2. Use of Transportation Rights-of-Way for Renewable Energy Transmission

The Champlain-Hudson Power Express (CHPE) has received permits, and the Clean Path New York is seeking permits to install renewable transmission lines in long stretches of the Hudson River. Installing these lines will have negative impacts on Hudson River habitats – as evidenced by the $117 million Environmental Trust Fund the developers of the CHPE project are required to fund to compensate for unavoidable damages to the Hudson and Lake Champlain. The CHPE line is also proposed to be laid in the reach of the Hudson that is a drinking water source for over 100,000 mid-Hudson Valley residents in the City and Town of Poughkeepsie, Village and Town of Rhinebeck, and the towns of Esopus, Hyde Park and Lloyd. Through the Hudson River Drinking Water Intermunicipal Council ("Hudson 7") these communities have sought measures that will mitigate concerns about drinking water quality. These diligent elected officials should never have put through the years-long process of due diligence and negotiation to win the protections they have so far achieved, and maintaining public trust in the quality of their drinking water through the construction remains a concern. In short, we can't allow the critical need for renewable energy infrastructure to damage the Hudson River - especially when road and rail transportation corridors run parallel to the river and offer an alternative.

Riverkeeper is exploring policy options for promoting the use of transportation rights-of-way for renewable energy transmission in New York State, and we seek the collaboration of legislators in exploring options that can promote a positive path forward for achieving critical climate change mitigation goals without compromising the 60-year legacy of improvements to the Hudson River, and without putting public drinking water supplies at risk.

Conclusion

Riverkeeper appreciates the opportunity to submit this testimony, and we look forward to working with elected representatives to advance policies that will address the issues we have raised. Riverkeeper also wants to publicly acknowledge and thank Louis Albaneses and Alejandra Vouga, Endeavor Foundation Environmental Action Fellows studying at Bennington College in Vermont; their research on our region's drinking water supplies assembled key facts presented in this testimony.

Contact Jeremy Cherson, Senior Manager of Government Affairs for Riverkeeper at jcherson@riverkeeper.org or 770-630-6790.

Public water supplies with sodium concentrations exceeding health guideline for people on very low sodium diets, according to their Annual Water Quality Reports (AWQR).

The table below shows water supplies that have reported an exceedance of the 20 mg/L sodium guideline in drinking water. All data obtained is from Annual Water Quality Reports from 2021-2022 of water supplies across NY State. The community column links to the Annual Water Quality Report for each community.

Water System / Community	Water source(s)	Population served	Serves PEJA and/or DAC community
Village of Suffern	4 wells	**11400**	Y
Brinkerhoff Water District	3 wells	**3788**	Y
Village of Wappingers Falls Municipal Water System	3 Groundwater wells	**6103**	Y
Village of Brewster Water Supply	5 Sand and gravel wells	**2500**	Y
Village of Fultonville	Groundwater sources	**740**	Y
Village of South Glens Falls	20 Groundwater springs	**3900**	Y
Clifton Park Water Authority	Groundwater wells	**35000**	N
Village of Wilton	Groundwater aquifers	**9055**	N
Village of Warwick	Three reservoirs	**6767**	N
Woodbury Consolidated	6 wells	**10000**	Y
Village of Richmondville	2 Rservoirs	**850**	Y
Town of Crawford	3 wells	**9300**	Y
Ulster Water District	3 Wells	**5500**	Y
Pine Bush Water District	3 Wells	**7650**	Y
Village of Kiryas Joel	Groundwater wells	**34396**	Y
Village of Hoosick Falls	3 Wells and Hoosick River	**4500**	N
Village of Montgomery	Seven Wells	**4600**	Y
Town of Rotterdam	Groundwater + City of Schenectady	**27000**	Y

Water System / Community	Water source(s)	Population served	Serves PEJA and/or DAC community
Suez/Veolia Water Company	Lake DeForest	**300000**	Y
Village of Chester	Surface and groundwater	**4000**	Y
Village of Monroe	Mombasha Lake reservoir and Well #4, located in the Village of Monroe	**9753**	Y
Warrensburg Water District	Our water source is 5 groundwater wells	**3600**	N
City of Saratoga Springs	Loughberry Lake Watershed and groundwater from the Geyser Crest system, Loughberry Lake from Bog Meadow Brook, Bog Meadow groundwater wells	**28000**	N
City of Saratoga Springs (Geyser Crest)	Loughberry Lake Watershed and groundwater from the Geyser Crest system. Water is also pumped into Loughberry Lake from Bog Meadow Brook, and 3 groundwater wells.	**28000**	N
City of Watervliet	Watervliet Reservoir	**10200**	Y
Yorktown Consolidated	Amawalk Reservoir	**36000**	Y
United Wappinger WD	Three Major Wells	**14000**	Y
City of Peekskill	Wiccopee Reservoir + Catskill Aqueduct	**25000**	Y
Heritage Hills	Our water source is five ground water wells located off Route 202 in the Town of Somers, New York	**4700**	N
Bethlehem - Water District No 1	Creek Reservoir, plus wells + wells under influence of Hudson River	**35000**	Y
Village of Scotia	Great Flats Aquifer which is sometimes referred to as the Schenectady Aquifer	**12800**	N

Water System / Community	Water source(s)	Population served	Serves PEJA and/or DAC community
New Windsor Consolidated	The Ashokan Reservoir feeds the Catskill Aqueduct	**25677**	Y
Village of Green Island	Infiltration gallery under influence of Hudson River	**3000**	Y
Wallkill Consolidated	Ground water (well) supply consisting of twenty (21) wells	**29000**	Y
Town of Carmel	Our water supply comes from Lake Gleneida, located in the Town of Carmel. Lake Gleneida is owned by NYC DEP and water is purchased by the Town of Carmel on a consumption basis	**6400**	N
Village of Washingtonville	Two sand and gravel wells	**7000**	Y
Bedford Consolidated	Our water is primarily obtained from New York City's Delaware Aqueduct. Water in the Delaware Aqueduct comes from the Delaware Watersheds.	**9056**	Y
Village of Croton-on-Hudson	Well system located in the Croton River Valley downstream from the New Croton Dam	**8210**	N
Village of Remsen	Two drilled groundwater wells	**510**	N
Village of Altamont	wells	**2000**	N
Town of Niskayuna	Two aquifers. In Mohawk River in the Town of Niskayuna.	**23278**	Y
Town of Greenport	Kashway Creek, South Well	**4050**	Y
Village of Fort Edward	Four reservoirs, two wells, three spring collection boxes	**3300**	N
Town of Guilderland	Watervliet Reservoir	**27692**	Y
Village of Schuylerville	Two wells	**2200**	N
Village of Fishkill	Our water source	**11289**	Y

Water System / Community	Water source(s)	Population served	Serves PEJA and/or DAC community
	consists of eight groundwater located in the Town of Fishkill		
Village of Pleasantville	Dependant on New Castle WD and NY Aqueducts	**9500**	Y
Suez Water Westchester RD2	Aquarion of Connecticut through the Putnam Reservoir located in Greenwich, Connecticut. & Purchased from Westchester Joint Water Works	**57301**	-
Newburgh Consolidated	Chadwick Lake Reservoir	**30975**	Y
Village of Nyack	Hackensack River.	**7200**	Y
Village of Ossining	The Indian Brook Reservoir, and the Croton Reservoir, which is part of the New York City Water System	**32000**	Y
Poughkeepsie (City & Town)	Hudson River, which originates from the north in the Adirondacks at Lake Tear of the Clouds,	**32000**	Y
Village of Highland Falls	2.9 sq Miles drainage area	**5400**	Y
Village of Argyle	six (6) wells located in the Town of Argyle near Summit Lake	**292**	
Village of Delanson	Lower spring fed reservoir of 28 million-gallons, which is our primary source of water. We also have an upper reservoir	**423**	N
Village of Mount Kisco	Byram Lake Reservoir	**10000**	Y
Town of Colonie (Latham)	Mohawk River / Wells (Stony Creek Reservoir backup)	**85890**	Y
Village of Maybrook	Seven drilled bedrock wells.	**3300**	Y
Village of Middleburgh	Two wells	**1500**	N
City of Middletown	Three reservoirs, two impoundments, one	**30452**	Y

Water System / Community	Water source(s)	Population served	Serves PEJA and/or DAC community
	creek and one groundwater well		
Village of Goshen	Prospect and Green Hill Reservoirs	**6100**	Y
Mohawk Valley Water Authority	Hinckley Reservoir	**126250**	Y
Village of Ilion	2 ground water wells	**9022**	Y
Town of Glenville	Great Flats Aquifer	**16000**	N
Liberty Village	Two wells	**1200**	Y
Dutchess Co. Water & Wastewater Authority (Hyde Park)	Hudson River	**6928**	Y
Staatsburg Water Company	Hudson River	**1164**	
Town of Waterford	Tommahannock (Troy)	**9800**	Y
Village of Walden	Groundwater wells	**7000**	Y
Village of Athens	The Popolopen Lake Dam, Mine Lake Dam, and Stillwell Lake Dam	**1700**	Y
Village of Rhinebeck	Hollister Lake	**6000**	N
Port Ewen (Town of Esopus)	Hudson River	**4500**	N
City of Hudson	Hudson River	**6713**	Y
Village of Fort Plain	Churchtown Reservoir	**1940**	Y
Village of Florida	Surface runoff and springs	**2900**	Y
City of Cohoes	Glenmore Lake Reservoir	**16883**	Y
Village of Ravena	Mohawk River	**3500**	N