AMERICAN RIVERS

Dear Administrator,

As the Regional Administrator of EPA Region 3, American Rivers, Anacostia Riverkeeper, Anacostia Watershed Society, Blue Water Baltimore/Baltimore Harbor Waterkeeper, Conservation Law Foundation, Natural Resources Defense Council, PennFuture, Potomac Riverkeeper, and Shenandoah Riverkeeper hereby petition you for a determination, pursuant to 40 CFR 122.26(a)(9)(i)(D), that non-*de minimis*, currently non-NPDES permitted stormwater discharges from commercial, industrial, and institutional sites are contributing to violations of water quality standards in certain impaired waters throughout Region 3, and therefore require National Pollutant Discharge Elimination System (NPDES) permits pursuant to Section 402(p) of the Clean Water Act.[1]

I. Factual Background

Stormwater runoff from impervious areas has significant negative impacts on water quality throughout this region and nationwide. As the EPA Office of Water has found,

resulted in a degradation of the conditions in downstream [14]

The deleterious effects of urbanization on water quality are evident from a review of the lists of impaired waters states must compile in compliance with the Clean Water Act. Thousands of water bodies nationwide are currently listed as impaired for stormwater-source pollutants such as pathogens, nutrients, sediments, and metals.[15] Of those impaired water bodies, by 2000, impairments from stormwater runoff were responsible for about 38,114 miles of impaired rivers and streams, 948,420 acres of impaired lakes, 2,742 square miles of impaired bays and estuaries, and 79,582 acres of impaired wetlands and the NRC considers these figures to be underestimates of actual impairments.[16]
impairment for 13 percent of all rivers, 18 percent of all lakes, and 32 percent of all estuaries, despite the fact that urban areas cover just 3 percent of U.S. land mass.[17]

In the mid-
impairments.[18] In fact, stormwater is responsible for over 4,000 miles of impaired streams throughout Region 3, including the Potomac River and Chesapeake Bay.[19] Studies performed in Virginia, for example, have found that runoff from urban areas greatly impairs stream ecology and the health of aquatic life.[20] Delaware has found that urban runoff is one of the primary
[21] Pennsylvania has stated that runoff
[22]

Since the adoption of the S 1 2h0485[illegible]lake54[illegible]92tiSini(in87.987.987.987.98702[illegible]05A005100030056Eic)4

> guidance for future sampling needs, and to enhance local stormwater management activities in areas having limited data. Over 10 years of monitoring data collected from more than 200 municipalities throughout the country have a great potential in characterizing the quality of stormwater runoff and comparing it against historical benchmarks. This project is creating a national database of stormwater monitoring data collected as part of the existing stormwater permit program, providing a scientific analysis of the data as well as recommendations for improving the quality and management value of future NPDES monitoring efforts (Pitt et al., 2004).[26]

The authors of the first report on the NSQD concluded that the national dataset represented in the database
needed and can no longer be justified.[27] Specifically, the authors stated:

> The excellent U.S. national coverage, along with the broad representation of land uses,

Virginia,[39] West Virginia,[40] and the District of Columbia[41] have established, and EPA has approved, water quality standards pursuant to this requirement.

In order to ensure that such water quality standards will be achieved, no person may discharge any pollutant into waters of the United States from a point source without a National Pollutant Discharge Elimination System (NPDES) permit.[42] NPDES permits must impose water quality-

EPA promulgated its Phase I and II regulations in 1990 and 1999, respectively.[49] As a result, the

[55] The Ninth Circuit Court of Appeals and Supreme Court of Vermont have both found that the designation of broad regional categories of sources is a reasonable exercise of statutory authority.[56]

Once EPA has made a finding or determination that a category of discharges meets the

that category for regulation, and t *shall* [57]

[58] As EPA has

recognized [59]

EPA has not defined a threshold level of contribution to water quality standards violations that would suffice to make such a determination. However, the agency has advised s that contribute more than *de minimis* amounts of pollutants identified as the cause of impairment to a water [60] The Supreme Court of Vermont has recognized this analysis as a valid interpretation of the RDA threshold.[61]

Once the Regional Administrator receives an RDA petition requesting that it exercise this authority, EPA must make a final decision on the petition within 90 days.[62]

III. Analysis

Non-*de minimis* discharges from impervious surfaces associated with industrial, institutional, and commercial sites[63] (including rooftops and parking lots) are contributing to violations of water quality standards throughout Region 3 This petition asks

EPA

NPDES permits. These geographic areas are readily identifiable consistent with the approach adopted by EPA in the Phase II rule.[67]

Attachment A to this Petition lists the waters in Region 3 impaired by lead, copper, zinc, sediments, turbidity, oxygen depletion, phosphorus, and/or nitrogen.

B. **Stormwater discharges from impervious surfaces on commercial, industrial, and institutional sites consistently contain elevated levels of these pollutants.**

Research demonstrates, and EPA has recognized, that commercial, industrial, and institutional land uses consistently discharge certain pollutants at expected, elevated concentrations (both generally as well as for specific runoff events) and have large annual per - acre pollutant loads. In fact, EPA has recommended use of pollutant loading and assessment models based on well-established pollutant loading levels associated with these land uses.

Recently, an EPA-sponsored stormwater practice performance analysis relied on

completed that document consistently high pollutant concentrations from commercial and industrial sources both on a per year and per acre basis.[72] Burton and Pitt Handbook, cited in Shaver et al., further documents that commercial, parking lot, and industrial land uses had consistently high COD, lead, and copper levels in addition to the TSS, phosphorus, nitrogen, and zinc levels cited in the EPA analysis.[73] These long-accepted estimates of total annual loading underscore that commercial, industrial, and institutional land uses are large per-acre contributors of pollutants.[74]

Analyses of the extensive dataset in the NSQD confirm that stormwater discharges from commercial, industrial, and institutional land uses consistently contain high loading levels of these impairment-causing pollutants. The NSQD, extensively referenced in Shaver et al. 2007, is very valuable because it builds on and corroborates prior datasets.[75] This dataset is also important because analysis and comparison of both median and mean pollutant concentrations in the data across numerous pollutant parameters clearly demonstrates that commercial, industrial, and

concentrations at commercial, industrial, and institutional sites increase pollutant load contributions even further.

1. Lead, Copper, and Zinc

Runoff from commercial, industrial, and institutional sites consistently contains elevated levels of harmful heavy metals, particularly lead, copper, and zinc. The National Research Council, in summarizing the comparative importance of urban land-use types in generating pollutants of concern on a per-unit-
characterizes the contribution of heavy metals from commercial s

concentrations at commercial sites to be 104 µg/L; median copper concentrations at commercial sites were 29 µg/L; and median zinc concentrations at commercial sites were 226 µg/L.[84]

These results are also consistent with a USGS study that found mean concentrations of these metals at commercial rooftops and commercial parking lots to be the following:[85]

Metal	Commercial Rooftops	Commercial Parking Lots
Lead	52 µg/L	40 µg/L
Copper	23 µg/L	25 µg/L
Zinc	348 µg/L	178 µg/L

Consistent with elevated concentrations in pollutant discharges, the land uses subject to the petition also have been shown to have large annual pollutant loadings. Shaver et al. provide an overview of typical pollutant loadings in pounds per acre per year (lbs/acre-yr) from different land uses.[86] Commercial areas discharge 2.1 lbs/acre-yr. of zinc, 0.4 lbs/acre-yr. of copper, and 2.7 lbs/acre-yr. of lead. Parking lots discharge 0.8 lbs/acre-yr. of zinc, 0.06 lbs/acre-yr. of copper, and 0.8 lbs/acre-yr. of lead. Industrial areas discharge 0.4 lbs/acre-yr. of zinc, 0.10 lbs/acre-yr. of copper, and 0.2 lbs/acre-yr. of lead. Shopping center uses discharge 0.6 lbs/acre-yr. of zinc, 0.09 lbs/acre-yr. of copper, and 1.1 lbs/acre-yr. of lead.

A report summarizing data from multiple studies of relative pollutant loadings found that the median loads of zinc from roads was 0.31 kg/ha per year and from commercial sites was 3.30 kg/ha per year, compared to 0.02 kg/ha per year from undeveloped forest land. The same report found that the median loadings of copper from roads was 0.06 kg/ha per year and from commercial sites was 2.10 kg/ha per year, compared to 0.03 kg/ha per year from undeveloped forest land.[87] Another study found that aggregate loadings of these metals from parking lots in a particular county were much greater than loadings from the same land before it was developed. Loadings of lead rose from 1.31 lbs (pre-development) to 67 lbs (with parking lots); loadings of copper rose from 1.648 lbs (pre-development) to 74 lbs (with parking lots); and loadings of zinc rose from 6.794 lbs (pre-development) to 930 lbs (with parking lots).[88]

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[84] Burton & Pitt, *Stormwater Effects Handbook*, *supra* note 73, at Table 2.4 (citing EPA, *Results of the Nationwide Urban Runoff Program*, *supra* note 80).
[85] Jeffrey Steuer et al., U.S. Geological Survey, *Sources of Contamination in an Urban Basin in Marquette, Michigan and an Analysis of Concentrations, Loads, and Data Quality* 20 (1997), *available at* http://pubs.usgs.gov/wri/1997/4242/report.pdf.
[86] Shaver et al., *Fundamentals of Urban Runoff Management* (2007),

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4. Phosphorus

Runoff from commercial, industrial, and institutional sites consistently contains high levels of phosphorus. Nutrient over-enrichment from phosphorus in runoff can lead to major impacts relating to the excessive growth of algae, which leads to nuisance algal blooms and eutrophic conditions.[106] Phosphorus often gets into runoff via atmospheric deposition and fertilizer application;[107] EPA also lists automobile exhaust as one source of phosphorus in urban runoff.[108]

Runoff from commercial, industrial, and institutional sites contains high concentrations of phosphorus. The National Stormwater Quality Database found median total phosphorus concentrations of 0.22 mg/L at commercial areas, 0.26 mg/L at industrial sites, and 0.18 mg/L at institutional areas.[109] Recent analysis of Version 3.1 of the NSQD demonstrates elevated mean concentrations for total phosphorus as well.[110] For commercial sites the mean total phosphorus concentration was 0.37 mg/L, for industrial sites 0.39 mg/L, and for institutional sites 0.23 mg/L. Whether comparing mean or median values, analysis of this extensive database indicates that the subject land uses discharge elevated concentrations of total phosphorus.

phosphorus concentrations at commercial sites to be 0.201 mg/L.[111] The USGS has found mean total phosphorus concentrations of 0.09 mg/L at commercial rooftops and 0.21 mg/L at commercial parking lots.[112]

Consistent with elevated concentrations in pollutant discharges, these land uses have been shown to generate large annual phosphorus loadings as well. Shaver et al. found that commercial areas discharge 1.5 lbs/acre-yr. of total phosphorus, parking lots discharge 0.7 lbs/acre-yr., industrial areas discharge 1.3 lbs/acre-yr., and shopping centers discharge 0.5 lbs/acre-yr.[113]

One study found average loadings of phosphorus to be 1.5 lb/acre per year from commercial land, compared to 0.03 lb/acre per year from undeveloped park land.[114] A report summarizing the results of multiple studies found median phosphorus loadings of 0.80 kg/ha per year from commercial sites and 1.10 kg/ha per year from roads, compared to 0.11 kg/ha per year

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[106] EPA, *Preliminary Data Summary of Urban Storm Water Best Management Practices*, *supra* note 81, at 4-13.
[107] DOT, FHWA, *Stormwater Best Management Practices in an Ultra-Urban Setting: Selection and Monitoring*, *supra* note 79, at Chapter 2, Table 1.
[108] EPA, *Preliminary Data Summary of Urban Storm Water Best Management Practices*, *supra* note 81, at 4-9.
[109] National Research Council, *supra* note 3, at 184-85, Table 3-4.
[110] Pitt, *The National Stormwater Quality Database, Version 3.1*, *supra* note 29, at 4.
[111] Burton and Pitt, *Stormwater Effects Handbook*, *supra* note 73, at Table 2.4.
[112] Steuer et al., *Sources of Contamination in an Urban Basin in Marquette, Michigan*, *supra* note 85, at 19.
[113] Shaver et al., *Fundamentals of Urban Runoff Management* (2007), *supra* note 26, at 3-63; Burton and Pitt, *Stormwater Effects Handbook*, *supra* note 73, at Table 2.5.
[114] Burton and Pitt, *Stormwater Effects Handbook*, *supra* note 73, at Table 2.5.

from undeveloped forests.[115] Another found annual loadings of 2 lb/acre per year from parking lots compared to 0.5 lb/acre per year from undeveloped meadows.[116] EPA Region 1 has used an annual phosphorus loading rate from commercial sites of 1.15-2.29 lb/acre per year for purposes of designating impervious areas for regulation (compared to a 0.10-0.13 lb/acre per year loading rate for forest and open space).[117] A study of aggregate runoff from parking lots in a particular county found that phosphorus loadings from these parking lots were 1,654 lbs, compared to loadings of 562 lbs from the land before it became parking lots.[118]

5. Nitrogen

Runoff from commercial, industrial, and institutional sites consistently contains high levels of nitrogen in various forms. Whether analyzing levels of Total Kjeldahl Nitrogen (TKN), which includes ammonia and organic forms of nitrogen,[119] or measuring only nitrate, nitrite, ammonia, or a sum of these values, studies consistently find elevated nitrogen levels in runoff from these sites. Like phosphorus, nutrient over-enrichment from nitrogen in runoff can lead to major impacts relating to the excessive growth of algae, which leads to nuisance algal blooms, lower dissolved oxygen levels, and eutrophic conditions.[120] Nitrogen often gets into runoff via atmospheric deposition and fertilizer application;[121] EPA also lists automobile exhaust as one source of nitrogen in urban runoff.[122]

Runoff from commercial, industrial, and institutional sites contains high concentrations of nitrogen. The National Stormwater Quality Database found median TKN concentrations of 1.6 mg/L at commercial areas, 1.4 mg/L at industrial areas, and 1.35 mg/L at institutional areas.[123] Recent analysis of Version 3.1 of the NSQD demonstrates elevated mean concentrations for TKN as well.[124] For commercial sites the mean TKN concentration was 1.9 mg/L, for industrial sites 1.9 mg/L, and for institutional sites 1.5 mg/L. Whether comparing mean or median values, analysis of this extensive database indicates that the subject land uses discharge elevated concentrations of nitrogen.
found similar results: it found median TKN concentrations at commercial sites to be 1.179

and institutional sites, which are not currently subject to Clean Water Act permitting

in Attachment A).

Requiring NPDES permits for these discharges will allow for the establishment of necessary and effective requirements to reduce existing stormwater pollution loadings. The

[140] and has recommended remedial actions such as conservation of natural areas, reducing hard surface cover (including parking lots), and retrofitting urban areas with features that hold and treat stormwater.[141] EPA has agreed,

[142] So have Region 3 jurisdictions; for example,

MS4 stormwater program does not require that MS4 permits regulate these sources of pollutants.[147] This situation is both unfair and is also less likely to result in attainment of water quality standards. Regulation of discharges from commercial, industrial, and institutional sites is therefore not only legally required, but also an equitable and efficient means of increasing the chances that local water bodies will attain their designated uses.

In conclusion, residual designation of these sources is necessary not only due to the substantial data and information documenting pollutant discharges to impaired waters, but also to assist municipalities that are struggling to bear the clean water burden without the regulatory participation of the largest impervious source categories. Since adoption of the Phase II rule in 1999, there has been a dramatic improvement in the understanding of the connection between impervious areas and degraded water quality conditions, and in the data on the large relative contribution of commercial, industrial, and institutional land uses.

[147] 64 Fed. Reg. at 68,
small, medium, and large MS4s would be responsible for controlling discharges from industrial and other facilities into their systems in lieu of requiring NPDES permit coverage for such facilities. EPA did not adopt this framework due to concerns with administrative and technical burden on the MS4 operators, as well as concerns about such an
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Respectfully submitted,

AMERICAN RIVERS
CONSERVATION LAW FOUNDATION
NATURAL RESOURCES DEFENSE COUNCIL

Dated: July 10, 2013

By:

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Jeffrey Odefey
P.O. Box 114
Tarrytown, NY 10591
(914) 584-8972
jodefey@americanrivers.org

Director of Stormwater Programs for American Rivers

Gary Belan
1101 14th Street NW, Suite 1400
Washington, DC 20005
(202) 243-7027
gbelan@americanrivers.org

Acting Senior Director, Clean Water Supply Program, for American Rivers

[redacted]

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Christopher Kilian, Esq.
15 East State Street
Montpelier, VT 05602
(802) 223-5992
ckilian@clf.org

Ivy Frignoca, Esq.
47 Portland Street, Suite 4
Portland, ME 04101
(207) 210-6439
ifrignoca@clf.org

Attorneys for Conservation Law Foundation

Jon Devine, Esq.
Rebecca Hammer, Esq.
1152 15th Street NW, Suite 300
Washington, DC 20005
(202) 289-6868
jdevine@nrdc.org
rhammer@nrdc.org

Larry Levine, Esq.
40 West 20th Street
New York, NY 10011
(212) 727-2700
llevine@nrdc.org