AMERICAN RIVERS
NATURAL RESOURCES DEFENSE COUNCIL

together with BLUE WATER BALTIMORE

Petition For A Determination That Stormwater Discharges From Commercial, Industrial, And Institutional Sites Contribute To Water Quality Standards Violations in the Back River Watershed (Baltimore, Maryland) And Require Clean Water Act Permits

September 17, 2015

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Dear Regional Administrator Garvin,

American Rivers, Natural Resources Defense Council, and Blue Water Baltimore hereby petition you, the Regional Administrator of U.S. Environmental Protection Agency (EPA) Region 3, for a determination that currently unpermitted stormwater discharges from privately-owned commercial, industrial, and institutional sites are contributing to violations of water quality standards in the Back River watershed (Baltimore, Maryland), and therefore require National Pollutant Discharge Elimination System (NPDES) permits pursuant to Section 402(p) of the Clean Water Act.[1]

Evidence summarized in this petition and included in the attached Exhibits shows that commercial, industrial, and institutional (CII) sites are unquestionably contributing to the Back River's nitrogen, phosphorus, and sediment impairments because:

- CII sites occupy 21.6% of the land area that flows into the Back River.
- 83% of this CII area is located within a half-mile of the river or its tributaries.
- Modeled results indicate that, out of all urban stormwater sources, CII sites contribute at least 33% of total phosphorus loadings, 42% of total nitrogen loadings, and 46% of sediment loadings in the watershed.
- CII sites likely cover 15% of the watershed with impervious surface.
- Studies of average pollutant loadings suggest that CII sites are alone contributing triple the pollutant loadings that the Back River would receive from the entire watershed under natural conditions.

Under the current regulatory program, municipalities bear the brunt of legal requirements to address the impacts of stormwater runoff pollution. However, remediating the degradation caused by stormwater often requires managing the runoff from a greater proportion of the landscape than a municipality directly controls. As a result, it is essential for private properties to take part in watershed restoration efforts, helping to implement the stormwater controls that are needed to reduce pollution and achieve clean rivers and streams. Imposing permitting requirements on private sites through residual designation authority (RDA) would make those sites part of the solution to our national and regional stormwater problems and would represent a more equitable allocation of clean-up responsibilities.

<u>Factual Background</u>

The Back River watershed drains approximately 158.1 square kilometers (61 square miles) in the western shore region of Maryland, northeast of the Baltimore Harbor, emptying into the Chesapeake Bay. The watershed lies within the political jurisdictions of Baltimore City and Baltimore County. The official 12-digit Hydrologic Unit Code (HUC-12) designations of the two HUC-12 watersheds making up the Back River drainage area are 020600030702 (Redhouse

[1] *See* 33 U.S.C. §§ 1342(p)(2)(E), (p)(6); 40 C.F.R. §§ 122.26(a)(1)(v), (a)(9)(i)(D), (f)(2).

Creek-Back River) and 020600030703 (Back River-Hawk Cove-Chesapeake Bay). No other watersheds lie upstream of the Back River watershed or flow into it. The watershed is bordered by the Baltimore Harbor watershed to the south, the Jones Falls watershed to the west, the Lower Gunpowder Falls watershed to the north, the Bird River watershed to the northeast, and the Middle River watershed to the east. The Back River watershed contains 73 miles of non-tidal tributary streams to the Back River estuary, including Chinquapin Run, Moores Run, Herring Run, and Redhouse Creek.[2] The estuary itself is relatively small with average depths ranging from five feet (in the upper estuary) to twenty-five feet (near the mouth).[3] Land cover data from 2011 indicate that the upstream HUC-12 portion of the watershed (020600030702) is 35.2% impervious, and the downstream HUC-12 portion of the watershed (020600030703) is 25.9% impervious.[4] As discussed in more detail below, the Back River is impaired by nitrogen, phosphorus, and sediment pollution in stormwater runoff from the area's predominantly urban land use.

Stormwater runoff from impervious areas harms water quality in the Back River watershed as well as throughout Maryland, Region 3, and nationwide. As the EPA Office of Water acknowledged, "Stormwater runoff in urban and developing areas is one of the leading sources of water pollution in the United States."[5] The National Research Council (NRC) agrees: "Stormwater runoff has a deleterious impact on nearly all of the nation's waters"[6] – as does the U.S. Court of Appeals for the Ninth Circuit Court: "Stormwater runoff is one of the most significant sources of water pollution in the nation."[7]

In its preamble to the permitting regulations for stormwater sources in 1999, EPA explained the impacts of stormwater runoff in detail:

> Storm water runoff from lands modified by human activities can harm surface water resources and, in turn, cause or contribute to an exceedance of water quality standards by changing natural hydrologic patterns, accelerating stream flows, destroying aquatic habitat, and elevating pollutant concentrations and loadings. Such runoff may contain or mobilize high levels of contaminants, such as sediment, suspended solids, nutrients (phosphorous and nitrogen), heavy metals and other toxic pollutants, pathogens, toxins,

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[2] Baltimore County, "Back River Watershed," http://www.baltimorecountymd.gov/Agencies/environment/watersheds/backmain.html.
[3] MDE, *Total Maximum Daily Loads of Nitrogen and Phosphorus for Back River in Baltimore City and Baltimore County, Maryland* at 1 (2005), *available at* http://www.mde.state.md.us/assets/document/BR_main_nuts_final.pdf (hereinafter "Back River TMDL").
[4] National Land Cover Database, http://www.mrlc.gov/nlcd11_data.php (*see* Exhibit A).
[5] U.S. Environmental Protection Agency, Office of Water, *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*, Forward by Peter S. Silva, Assistant Administrator (Dec. 2009), *available at* http://www.epa.gov/oaintrnt/documents/epa_swm_guidance.pdf.
[6] National Research Council, Committee on Reducing Stormwater Discharge Contributions to Water Pollution, *Urban Stormwater Management in the United States* at 25 (2009), *available at* http://www.nap.edu/catalog.php?record_id=12465.
[7] *Environmental Defense Center v. EPA*, 344 F.3d 832, 840 (9th Cir. 2003).

> oxygen-demanding substances (organic material), and floatables. … Individually and combined, these pollutants impair water quality, threatening designated beneficial uses and causing habitat alteration or destruction.[8]

These water quality impairments "result[] in an unhealthy environment for aquatic organisms, wildlife, and humans."[9]

EPA accepts that stormwater runoff is a "contributor to water quality impairments across the country, particularly in developing and urbanized areas."[10] Stormwater causes these problems in large part due to the harmful contaminants that it carries into receiving waters. According to the NRC, "The chemical effects of stormwater runoff are pervasive and severe throughout the nation's urban waterways, and they can extend far downstream of the urban source. … A variety of studies have shown that stormwater runoff is a vector of pathogens with potential human health implications."[11]

In particular, over 250 studies reveal that increases in impervious area associated with urban development are a "collection site for pollutants,"[12] and generate greater quantities (and additional types) of contaminants. Urban development creates new pollution sources as population density increases and brings with it "proportionately higher levels of car emissions, maintenance wastes, pet waste, litter, pesticides, and household hazardous wastes, which may be washed into receiving waters by storm water."[13] These increases in pollutant loadings can result in immediate and long-term effects on the health of the water body and the organisms that live in it.[14] The U.S. Geological Survey found that, in areas of increased urban development, local rivers and streams exhibited increased concentrations of contaminants such as nitrogen, chloride, insecticides, and polycyclic aromatic hydrocarbons (PAHs).[15]

The increased stormwater volume and pollutant loadings caused by urbanization, especially impervious cover, are closely connected with water body impairment. Contaminants, habitat destruction, and increasing streamflow flashiness resulting from urban development have been associated with the disruption of biological communities.[16] The NRC states, "By almost

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[8] National Pollutant Discharge Elimination System—Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, 64 Fed. Reg. 68,722, 68,724 (Dec. 8, 1999) (citation omitted).
[9] *Id.*
[10] U.S. Environmental Protection Agency, *TMDLs to Stormwater Permits Handbook*, Office of Water cover letter (2008), *available at* http://www.epa.gov/owow/tmdl/pdf/tmdl-sw_permits11172008.pdf.
[11] National Research Council, *supra* note 6, at 26.
[12] EPA, Office of Water, *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*, *supra* note 5, at 5.
[13] 64 Fed. Reg. at 68,725.
[14] U.S. Geological Survey, *Effects of Urban Development on Stream Ecosystems in Nine Metropolitan Study Areas Across the United States* at 20 (2012), *available at* http://pubs.usgs.gov/circ/1373/.
[15] *Id.* at 3.
[16] *Id.* at 1.

any currently applied metric…the net result of human alteration of the landscape to date has resulted in a degradation of the conditions in downstream watercourses."[17]

A review of the lists of impaired waters states must compile in compliance with the Clean Water Act (CWA or Act) reveals the deleterious effects of urbanization on water quality. Thousands of water bodies nationwide fail to meet standards established for stormwater-source pollutants such as pathogens, nutrients, sediments, and metals.[18] Of those impaired water bodies, by 2000, stormwater runoff sources 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.[19] Urban stormwater is listed as the "primary" source of 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.[20]

In the mid-Atlantic region, stormwater runoff is a "leading source" of stream impairments.[21] In fact, stormwater is responsible for over 4,000 miles of impaired streams throughout Region 3, including the Potomac River and Chesapeake Bay.[22] Maryland acknowledges that stormwater from urban and suburban development is the state's fastest growing source of pollution.[23]

Since the 1999 adoption of the Phase II stormwater rule, which established permitting requirements for small municipalities and construction sites, the scientific understanding of the correlation between impervious surfaces and water quality impairments has increased significantly. EPA recognizes the now-well-understood connection between high percentages of impervious cover in watersheds and pollutant loading-driven impairments (among many other deleterious effects). EPA commonly approves state-developed 303(d) lists identifying impaired waters afflicted by pollutants typically discharged from stormwater sources. Numerous peer reviewed scientific articles and publications document the connection between impervious cover and declines in water quality and stream health.

In recent years, EPA created the Causal Analysis/Diagnosis Decision Information System, or "CADDIS" Urbanization Module**,** "a website developed to help scientists and

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[17] National Research Council, *supra* note 6, at 17.
[18] EPA, *TMDLs to Stormwater Permits Handbook*, *supra* note 10, at Cover Letter.
[19] National Research Council, *supra* note 6, at 25.
[20] *Id.*
[21] U.S. Environmental Protection Agency Region 3, *Understanding Impaired Waters and Total Maximum Daily Load (TMDL) Requirements for Municipal Stormwater Programs* (Jan. 2008), *available at* http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/upload/region3_factsheet_tmdl.pdf.
[22] Press Release, U.S. Environmental Protection Agency Region 3, EPA, DC Showcase Recovery Act Funded Green Roof (Sept. 29, 2010), *available at* http://yosemite.epa.gov/opa/admpress.nsf/0/2d6b4942ef6d65b0852577ad0053f099?OpenDocument.
[23] MDE, *Maryland's Draft 2014 Integrated Report of Surface Water Quality* at 13 (Aug. 2014), *available at* http://www.mde.state.md.us/programs/Water/TMDL/Integrated303dReports/Pages/2014IR.aspx.

engineers in the Regions, States, and Tribes conduct causal assessments in aquatic systems."[24] Through this module EPA provides a comprehensive overview of the connection between impervious surfaces (and other facets of urbanization) and declines in water quality for use in causal assessment for specific stressors including pollutant categories. In the CADDIS Module, EPA reiterated that "Urbanization has been associated with numerous impairments of water and sediment quality," including, but not limited to, increased nitrogen, phosphorus, and sediment.[25]

The National Stormwater Quality Database, now in its fourth version, represents perhaps the greatest development in available data since adoption of the Phase II rule.[26] This database enable the publication of numerous analyses corroborating prior understandings and providing new and very reliable characterizations of pollutant loading and concentrations from specific land use categories. Shaver et al. underscored the significance of the NSQD:

> In the NSQD project, stormwater quality data and site descriptions are being collected and reviewed to describe the characteristics of national stormwater quality, to provide 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).[27]

The authors of the first report on the NSQD concluded that the national dataset represented in the database is so robust that "general characterization" monitoring is no longer needed and can no longer be justified.[28] Specifically, the authors stated:

> The excellent U.S. national coverage, along with the broad representation of land uses, seasons, and other factors, makes this information highly valuable for numerous basic stormwater management needs. Monitoring with no specific objective, except for general

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[24] U.S. EPA, "CADDIS: The Causal Analysis/Diagnostic Decision Information System," http://www.epa.gov/caddis/index.html.
[25] U.S. EPA, "CADDIS Volume 2: Sources, Stressors & Responses," http://www.epa.gov/caddis/ssr_urb_wsq1.html.
[26] National Stormwater Quality Database, http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml & http://www.bmpdatabase.org/nsqd.html. According to Pitt et al., to create the NSQD, "The University of Alabama and the Center for Watershed Protection were awarded an EPA Office of Water 104(b)3 grant in 2001 to collect and evaluate stormwater data from a representative number of NPDES (National Pollutant Discharge Elimination System) MS4 (municipal separate storm sewer system) stormwater permit holders." Robert Pitt et al., *The National Stormwater Quality Database (NSQD, Version 1.1)* 2 (2004), *available a*t http://rpitt.eng.ua.edu/Research/ms4/Paper/MS4%20Feb%2016%202004%20paper.pdf.
[27] Earl Shaver et al., *Fundamentals of Urban Runoff Management: Technical and Institutional Issues* 3-59 (2007), *available at* http://www.ilma-lakes.org/PDF/Fundamentals_full_manual_lowres.pdf.
[28] Pitt et al., *The National Stormwater Quality Database (NSQD, Version 1.1), supra* note 26, at 33.

> characterization in an area, is not likely to provide any additional value beyond the data and information contained in NSQD. After a sufficient amount of data has been collected by a Phase 1 community for representative land uses and other conditions, outfall characterization monitoring resources should be re-directed to other specific data collection and evaluation needs. Burton and Pitt (2001) provide much additional information on determining an adequate outfall monitoring program. Similarly, communities that have not initiated a stormwater monitoring program . . . may not require general characterization monitoring . . . , if they can identify a regional Phase I community that has compiled extensive monitoring data as part of their required NPDES stormwater permit. Obviously, there will be some situations that are not well represented in NSQD and additional characterization monitoring may be warranted. These situations will be identified in the final data analyses.[29]

In other words, available data are able to characterize stormwater pollutant concentrations and loading rates for purposes of regional or watershed analyses, such as residual designation. Indeed, in developing stormwater permit requirements, EPA has used literature reviews, including analyses of NSQD data, to conclude that discharges of urban runoff can be "reasonably assumed" to contain certain pollutants at predictable average concentrations.[30]

More recently, Version 3.1 of the NSQD has been compiled and improved through integration of various databases into one highly reliable dataset. [31] NSQD 3.1 provides a basis for assessing runoff sources nationally and includes detailed analysis of the expanded datasets within EPA designated "Rain Zones," which reflect the differences in precipitation in various defined regions of the nation.

Just as EPA knows more today about pollutant concentrations and loadings from urban areas, the agency knows much more about the connection between large areas of impervious cover and water quality impairments. As EPA acknowledges: "There is a direct relationship between the amount of impervious cover and the biological and physical condition of downstream receiving waters."[32] The fact that commercial, industrial and institutional facilities with large areas of impervious cover contribute pollutants to receiving waters can no longer be reasonably refuted. Having acknowledged these now well-understood facts, EPA must, at long last, assist municipalities in addressing these pollutant sources by exercising its residual

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[29] *Id.*

[30] U.S. EPA Region 1, Statement of Basis for Proposed Modifications to the Draft General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in New Hampshire at 2 (2015), *available at* http://www.epa.gov/region1/npdes/stormwater/nh/nhms4-renotice-statement-of-basis.pdf (hereinafter "New Hampshire MS4 Statement of Basis").

[31] Robert Pitt, *The National Stormwater Quality Database, Version 3.1* (Mar. 8, 2011), available at http://rpitt.eng.ua.edu/Publications/4_Stormwater_Characteristics_Pollutant_Sources_and_Land_Development_Characteristics/Stormwater_characteristics_and_the_NSQD/NSQD%203.1%20summary%20for%20EPA%20Cadmus.pdf.

[32] EPA, *Managing Stormwater with Low Impact Development Practices: Addressing Barriers to LID* 1 (Apr. 2009), *available at* http://www.epa.gov/region1/npdes/stormwater/assets/pdfs/AddressingBarrier2LID.pdf.

designation authority under the Clean Water Act to require those facilities to address their contribution to water quality violations.

Regulatory Framework

In order to achieve the Clean Water Act's fundamental goal of "restor[ing] and maintain[ing] the chemical, physical, and biological integrity of the Nation's waters,"[33] EPA and states that are delegated authority to administer the Act must establish minimum water quality standards.[34] These standards define "the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses."[35] Maryland established, and EPA approved, water quality standards pursuant to this requirement.[36]

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.[37] NPDES permits must impose water quality-based effluent limitations, in addition to any applicable technology-based effluent limitations, when necessary to meet water quality standards.[38]

The Act defines "point source" as "any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit…from which a pollutant is or may be discharged."[39] EPA's Clean Water Act regulations further specify that "discharge of a pollutant" includes "additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man."[40] Consequently, although stormwater discharges are often characterized as "non-point" in nature, it is legally well settled that "[s]torm sewers are established point sources subject to NPDES permitting requirements."[41] As EPA has stated, "For the purpose of [water quality] assessments, urban runoff was considered to be a diffuse source or nonpoint source pollution. From a legal standpoint, however, most urban runoff is discharged through conveyances such as separate storm sewers or other conveyances which are point sources under the CWA."[42]

Despite the fact that stormwater runoff channeled through a conveyance is a point source subject to the Act's permitting requirements, EPA did not regulate stormwater through the

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[33] 33 U.S.C. § 1251(a).
[34] 33 U.S.C. § 1313; 40 C.F.R. § 131.2.
[35] 40 C.F.R. § 131.2.
[36] Md. Code Regs. 26.08.01.01-26.08.02.13.
[37] 33 U.S.C. §§ 1311(a), 1362(12)(A).
[38] 33 U.S.C. § 1311(b).
[39] 33 U.S.C. § 1362(14).
[40] 40 C.F.R. § 122.2.
[41] *Environmental Defense Center v. EPA*, 344 F.3d at 841 (citing *Natural Resources Defense Council v. Costle*, 568 F.2d 1369, 1379 (D.C. Cir. 1977)).
[42] National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, 55 Fed. Reg. 47,990, 47,991 (Nov. 16, 1990).

NPDES program until Congress amended the statute in 1987 to explicitly require it[43] and EPA promulgated its Phase I and II regulations in 1990 and 1999, respectively.[44] As a result, the Clean Water Act now requires NPDES permits for discharges of industrial and municipal stormwater.[45] While these are the only categories of stormwater discharges called out for regulation in the text of the statute, Congress also created a catch-all provision directing EPA to require NPDES permits for any stormwater discharge that the Administrator or the State director determines "contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States."[46]

This catch-all authority—known as EPA's residual designation authority—is a critical tool to ensure that problematic discharges of stormwater do not go unregulated. In the preamble to its Phase II stormwater regulations, EPA described the need for this authority: "EPA believes…that individual instances of storm water discharge might warrant special regulatory attention, but do not fall neatly into a discrete, predetermined category. Today's rule preserves the regulatory authority to subsequently address a source (or category of sources) of storm water discharges of concern on a localized or regional basis."[47] Citizens may petition EPA for designation of stormwater sources for regulation under this authority.[48] In recent years, often acting in response to such petitions, EPA and delegated States have moved to exercise this residual designation authority on multiple occasions.[49]

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[43] *See* 33 U.S.C. § 1342(p). Congressional insistence that stormwater be regulated through the NPDES program is evident in the legislative history of the 1987 amendment, such as the following statement from Senator Durenberger during the floor debates:

> The Federal Water Pollution Control Act of 1972 required all point sources, including storm water discharges, to apply for NPDES permits within 180 days of enactment. Despite this clear directive, E.P.A. has failed to require most storm water point sources to apply for permits which would control the pollutants in their discharge. The conference bill therefore includes provisions which address industrial, municipal, and other storm water point sources. I participated in the development of this provision because I believe it is critical for the Environmental Protection Agency to begin addressing this serious environmental problem.

133 Cong. Rec. S752 (daily ed. Jan. 14, 1987).

[44] National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, 55 Fed. Reg. 47,990 (Nov. 16, 1990); National Pollutant Discharge Elimination System—Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, 64 Fed. Reg. 68,722 (Dec. 8, 1999).

[45] 33 U.S.C. § 1342(p)(2).

[46] 33 U.S.C. § 1342(p)(2)(E); 40 C.F.R. § 122.26(a)(1)(v).

[47] National Pollutant Discharge Elimination System—Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, 64 Fed. Reg. at 68,781.

[48] 40 C.F.R. § 122.26(f)(2).

[49] U.S. EPA Region VI, *Los Alamos County Preliminary Designation Document* (Mar. 2015), *available at* http://www.epa.gov/region6/water/npdes/publicnotices/nm/preliminary_designation_los_alamos_full_doc.pdf; U.S. EPA Region IX, *Request for Designation of MS4 Discharges on the Island of Guam for NPDES Permit Coverage* (Feb. 2011), *available at* http://www.epa.gov/region9/water/npdes/pdf/guam/Guam-ms4-residual-designation-memo.pdf; Vermont Agency of Natural Resources, Department of Environmental Conservation, *Final Designation Pursuant to the Clean Water Act for Designated Discharges to Bartlett, Centennial, Englesby, Morehouse and Potash Brooks* (Nov. 2009), *available at* http://www.vtwaterquality.org/stormwater/docs/swimpairedwatersheds/sw_rda_final_determination.pdf; U.S. EPA

Categories of sources designated under EPA's residual designation authority may be geographically broad. The agency has stated that "the designation authority can be applied within different geographic areas to any single discharge (i.e., a specific facility), or category of discharges…The added term 'within a geographic area' allows 'State-wide' or 'watershed-wide' designation within the meaning of the terms."[50] 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.[51]

Once EPA has made a finding or determination that a category of discharges meets the statutory criterion of "contribut[ing] to a violation of a water quality standard," it must designate that category for regulation, and those "operators *shall* be required to obtain a NPDES permit."[52] In other words, "the Agency's residual designation authority is not optional."[53]

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 delegated States that "it would be reasonable to require permits for discharges that contribute more than *de minimis* amounts of pollutants identified as the cause of impairment to a water body."[54] The Supreme Court of Vermont has recognized this analysis as a valid interpretation of the RDA threshold.[55]

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.[56]

<u>Analysis</u>

Discharges from impervious surfaces associated with privately-owned commercial, industrial, and institutional (collectively, "CII") sites[57] (including rooftops and parking lots) are contributing to violations of water quality standards in the Back River watershed. This petition

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Region I, *Final Determination Under Section 402(p) of the Clean Water Act—Long Creek* (Oct. 2009), *available at* http://www.epa.gov/region1/npdes/stormwater/assets/pdfs/LongCreekFinalResidualDesignation.pdf; U.S. EPA Region I, *Residual Designation Pursuant to Clean Water Act—Charles River* (Nov. 2008), *available at* http://www2.epa.gov/sites/production/files/2015-03/documents/rodfinalnov12.pdf.

[50] National Pollutant Discharge Elimination System—Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, 64 Fed. Reg. at 68,781.

[51] *Environmental Defense Center*, 344 F.3d at 875-76; *In re Stormwater NPDES Petition*, 910 A.2d 824, 829-32 (Vt. 2006).

[52] 40 C.F.R. § 122.26(a)(9)(i)(D) (emphasis added).

[53] *In re Stormwater NPDES Petition*, 910 A.2d at 835-36.

[54] Letter from G. Tracy Mehan III, EPA Assistant Administrator, to Elizabeth McLain, Secretary, Vermont Agency of Natural Resources 3 (Sept. 16, 2003).

[55] *In re Stormwater NPDES Petition*, 910 A.2d at 836 n.6.

[56] 40 C.F.R. § 122.26(f)(5).

[57] For purposes of this petition, these CII land use categories are defined by Maryland's Land Use and Land Cover dataset. CII sites include lands classified within the Commercial, Industrial, and Institutional LULC categories. Maryland Department of Planning, 2010 Land Use Land Cover Data, *available at* http://www.mdp.state.md.us/OurProducts/downloadFiles.shtml.

demands that EPA exercise its mandatory residual designation authority to designate non-NPDES-permitted stormwater discharges from sites in these categories for regulation under the NPDES program. For purposes of this petition, "non-NPDES-permitted stormwater discharges" includes any stormwater discharge from a private property, or from a portion of a property, that is not subject to post-construction stormwater pollution control requirements under a NPDES permit. For example, where an industrial stormwater permit requires pollution controls only for stormwater discharges from the portions of an industrial site on which "industrial activity" takes place, stormwater discharges from the remaining portion of that industrial site are included in the term "non-NPDES-permitted stormwater discharges." The term "non-NPDES-permitted stormwater discharges" includes stormwater discharges from properties (or portions thereof) that are within the geographic boundaries of a regulated municipal separate storm sewer system (MS4).

In 2013, several environmental organizations, including American Rivers and the Natural Resources Defense Council, petitioned EPA Regions 1, 3, and 9 for a determination that commercial, industrial, and institutional sites throughout those EPA regions were contributing to violations of water quality standards. (Those petitions are hereafter referred to as the "2013 Petitions.") In responding to the 2013 Petitions, EPA considered three factors: (i) the likelihood of exposure of pollutants to precipitation at sites in the categories identified in the petition; (ii) the sufficiency of available data to evaluate the contribution of stormwater discharges to water quality impairment from the targeted categories of sites; and (iii) whether other federal, state, or local programs adequately address the known stormwater discharge contribution to a water quality standard violation. As discussed in more detail below, the petitioners do not concede that the third of these factors is a permissible factor for EPA to consider when deciding whether to exercise RDA. Nonetheless, because EPA established these as its review criteria in responding to the 2013 Petitions, this petition is structured to address each of those three criteria in turn.

I. Stormwater Discharges from CII Sites Contain Nitrogen, Phosphorus, and Sediment

Runoff from commercial, industrial, and institutional sites consistently contains high levels of nitrogen, phosphorus, and sediment. Nutrient over-enrichment from nitrogen and phosphorus in runoff can lead to major impacts relating to the excessive growth of algae, which leads to nuisance algal blooms and eutrophic conditions (including low dissolved oxygen).[58] Nitrogen and phosphorus often get into runoff via atmospheric deposition and fertilizer application;[59] EPA also lists automobile exhaust as one source of nutrients in urban runoff.[60] Sediment provides a medium for the accumulation, transport, and storage of other pollutants,

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[58] EPA, *Preliminary Data Summary of Urban Storm Water Best Management Practices* 4-13 (Aug. 1999), *available at* http://water.epa.gov/scitech/wastetech/guide/stormwater/.

[59] U.S. Department of Transportation, Federal Highway Administration, *Stormwater Best Management Practices in an Ultra-Urban Setting: Selection and Monitoring* Chapter 2, Table 1, *available at* http://environment.fhwa.dot.gov/ecosystems/ultraurb/uubmp2.asp.

[60] EPA, *Preliminary Data Summary of Urban Storm Water Best Management Practices, supra* note 58, at 4-9.

including nutrients and metals.[61] It can harm fish and macroinvertebrate communities by decreasing available light in streams and smothering fish eggs.[62]

Research demonstrates, and EPA has recognized, that commercial, industrial, and institutional land uses consistently discharge nitrogen, phosphorus, and sediment at expected, elevated concentrations (both generally as well as for specific runoff events) and have large annual per-acre pollutant loads. Relying on the NSQD and a literature review of other studies, including many discussed below, EPA has determined that "it can be reasonably assumed" that urban stormwater discharges, which include discharges from CII sites, contain nutrients and sediments at predicted average concentrations.[63] Further, EPA has recommended the use of pollutant loading and assessment models based on well-established pollutant loading levels associated with commercial, industrial, and institutional land uses.

In recent years, an EPA-sponsored stormwater practice performance analysis relied on "pollutant loading export rates … obtained from the *Fundamentals of Urban Runoff Management: Technical and Institutional Issues* (Shaver et al. 2007) … because they have been reported in several sources of stormwater management literature."[64] This analysis identified "typical pollutant loading export rates" for total phosphorus, total nitrogen, and total suspended solids (TSS, a measure of sediment) from different land uses. The analysis recognized that commercial and industrial land uses consistently had very significant pollutant loadings for total phosphorus (1.5 and 1.3 lbs/ac-yr, respectively), total nitrogen (9.8 and 4.7 lbs/ac-yr, respectively), and TSS (1000 and 670 lbs/ac-yr, respectively).[65]

In turn, the Shaver et al. study referenced in that EPA-sponsored guidance cites EPA's own *Handbook for Developing Watershed Plans to Restore and Protect Our Waters*, stating: "Many models utilize literature-based values for water-quality concentrations to estimate pollutant loads (US-EPA 2005)."[66] In the 2008 version of that handbook, EPA provides a specific recommendation with regard to "where to get export coefficients" for different land uses, including a reference to a 2004 data review by Jeff P. Lin, which "summarizes and reviews published export coefficient and event mean concentration (EMC) data for use in estimating pollutant loading into watersheds."[67] Lin in turn confirms that numerous studies have been completed that document consistently high pollutant concentrations from commercial and

[61] *Id.* at 4-12.
[62] National Research Council, *supra* note 6, at 21.
[63] EPA Region 1, New Hampshire MS4 Statement of Basis, *supra* note 30, at 2.
[64] Tetra Tech, Inc., *Stormwater Best Management Practices (BMP) Performance Analysis* at 18 (Dec. 2008, revised Mar. 2010), prepared for EPA Region 1, *available at* http://www.epa.gov/region1/npdes/stormwater/assets/pdfs/BMP-Performance-Analysis-Report.pdf.
[65] *Id.*
[66] Earl Shaver et al., *Fundamentals of Urban Runoff Management: Technical and Institutional Issues* at 3-63 (North American Lake Management Society 2007).
[67] EPA, *Handbook for Developing Watershed Plans to Restore and Protect Our Waters* at 8-7 (2008), *available at* http://water.epa.gov/polwaste/nps/upload/2008_04_18_NPS_watershed_handbook_handbook.pdf.

industrial sources both on a per-year and per-acre basis.[68] Burton and Pitt's *Stormwater Effects Handbook*, cited in Shaver et al., further documents that commercial, parking lot, and industrial land uses had consistently high phosphorus, nitrogen, and TSS levels.[69] These long-accepted estimates of total annual loading underscore that commercial, industrial, and institutional land uses are large per-acre contributors of pollutants.[70]

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.[71] 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 institutional land uses discharge elevated *concentrations* of phosphorus, nitrogen, and sediment (as well as other pollutants).[72] These elevated concentrations are responsible in part for the high pollutant loadings from these land uses; the increased impervious cover on these types of sites generates greater runoff volumes, and loadings are the product of volume and pollutant concentration. Based on the Center for Watershed Protection's "Simple Method" for calculating pollutant loads, for unit-area loadings to a water body, essentially any medium- to high-intensity land use (like the uses subject to this petition) is likely to impose 10- to 20-fold increases in pollutant loadings.[73] Higher average pollutant concentrations at commercial, industrial, and institutional sites increase pollutant load contributions even further.

The NSQD found median Total Kjeldahl Nitrogen (TKN)[74] concentrations of 1.6 mg/L at commercial areas, 1.4 mg/L at industrial areas, and 1.35 mg/L at institutional areas.[75] It also 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.[76] It found median TSS concentrations of 55 mg/L at commercial areas, 73 mg/L at industrial areas, and 18 mg/L at institutional areas.[77]

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[68] Jeff P. Lin, U.S. Army Corps of Engineers, Wetlands Regulatory Assistance Program, *Review of Published Export Coefficient and Event Mean Concentration (EMC) Data* (2004), *available at* http://coast.noaa.gov/digitalcoast/_/pdf/GetTRDoc.pdf.
[69] G.A. Burton & R.E. Pitt, *Stormwater Effects Handbook* (2002).
[70] *See* National Research Council, *supra* note 6, at 180.
[71] Shaver et al., *Fundamentals of Urban Runoff Management*, *supra* note 27, at 3-59; Pitt, *The National Stormwater Quality Database, Version 3.1*, *supra* note 31, at 1 ("Recently, version 3 of the NSQD was completed, and besides expanding to include additional stormwater NPDES MS4 permit holders, most of the older NURP data, and some of the International BMP database information was also added, along with data from some USGS research projects.").
[72] Pitt et al., *The National Stormwater Quality Database (NSQD, Version 1.1)*, *supra* note 26; Pitt, *The National Stormwater Quality Database, Version 3.1*, *supra* note 31.
[73] *See* Center for Watershed Protection, *Impacts of Impervious Cover on Aquatic Systems* (2003) at Section 4.3.
[74] Nitrogen levels can be measured by analyzing levels of Total Kjeldahl Nitrogen (TKN), which includes ammonia and organic forms of nitrogen, or measuring only nitrate, nitrite, ammonia, or a sum of these values. *See* EPA, *Preliminary Data Summary of Urban Storm Water Best Management Practices*, *supra* note 58, at 4-13.
[75] Pitt et al., *The National Stormwater Quality Database (NSQD, Version 1.1)*, *supra* note 26, at 9-10.
[76] National Research Council, *supra* note 6, at 184-85, Table 3-4.
[77] *Id.*

Recent analysis of Version 3.1 of the NSQD demonstrates elevated mean concentrations for TKN, total phosphorus, and sediment as well.[78] For TKN, in Rain Zone 2 (where the Back River is located), the mean concentration at commercial sites was 2.0 mg/L, at industrial sites 1.8 mg/L, and at institutional sites 1.6 mg/L, compared to 1.2 mg/L at open space. For total phosphorus, the mean concentration at commercial sites was 0.37 mg/L, at industrial sites 0.36 mg/L, and at institutional sites 0.24 mg/L, compared to 0.33 mg/L at open space.[79] And for TSS, the mean concentration at commercial sites was 101 mg/L, at industrial sites 97 mg/L and at institutional sites 86 mg/L, compared to 98 mg/L at open space.[80] Whether comparing mean or median values, analysis of this extensive database indicates that the subject land uses discharge elevated concentrations of nitrogen, phosphorus, and sediment.

EPA's National Urban Runoff Program study found similar results: it found median TKN concentrations at commercial sites to be 1.179 mg/L (compared to 0.965 mg/L at open space), median phosphorus concentrations at commercial sites to be 0.201 mg/L (compared to 0.121 at open space), and median TSS concentrations at commercial sites to be 69 mg/L (compared to 70 mg/L at open space).[81] The USGS has found mean TKN concentrations of 1.7 mg/L at commercial rooftops and 1.5 mg/L at commercial parking lots; mean total phosphorus concentrations of 0.09 mg/L at commercial rooftops and 0.21 mg/L at commercial parking lots; and mean suspended solids of 24 mg/L at commercial rooftops and 138 mg/L at commercial parking lots.[82]

One study found an average TKN concentration of 5.07 mg/L in surface runoff from industrial sites.[83] Another study found average nitrate concentrations of 1.1 mg/L in runoff from parking lots on commercial sites, and 1.0 mg/L in runoff from parking lots on light industrial sites.[84] A regional study found that TKN event mean concentrations for asphalt parking lots on commercial sites averaged in range from 0.38 to 1.37 mg/L.[85]

[78] Pitt, *The National Stormwater Quality Database, Version 3.1*, *supra* note 31, at 5.
[79] *Id.*
[80] *Id.*
[81] Burton and Pitt, *Stormwater Effects Handbook*, *supra* note 69, at Table 2.4.
[82] 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* 19 (1997), *available at* http://pubs.usgs.gov/wri/1997/4242/report.pdf.
[83] J.S. Choe et al., "Characterization of Surface Runoff of Urban Areas," *Water Sci. Tech.* 45(9) (2002), 249-54, at Table 3.
[84] Hope et al., "Nutrients on Asphalt Parking Surfaces in Urban Environments," *Water, Air and Soil Pollution: Focus* Vol. 4, Issue 2-3, 371-90, at Table 2.
[85] E. Passeport & W. Hunt, "Asphalt Parking Lot Runoff Nutrient Characterization for Eight Sites in North Carolina, USA," *Journal of Hydrologic Engineering* Vol. 14, Special Issue: Impervious Surfaces in Hydrologic Modeling and Monitoring (2009), 352-62, at Table 4.

Table 1: Summary of Pollutant Concentrations Documented in CII Site Runoff

Study	Commercial Sites	Industrial Sites	Institutional Sites	Open Space
NSQD 1.1	TKN: 1.6 mg/L TP: 0.22 mg/L TSS: 55 mg/L	TKN: 1.4 mg/L TP: 0.26 mg/L TSS: 73 mg/L	TKN: 1.35 mg/L TP: 0.18 mg/L TSS: 18 mg/L	
NSQD 3.1	TKN: 2.0 mg/L TP: 0.37 mg/L TSS: 101 mg/L	TKN: 1.8 mg/L TP: 0.36 mg/L TSS: 97 mg/L	TKN: 1.6 mg/L TP: 0.24 mg/L TSS: 86 mg/L	TKN: 1.2 mg/L TP: 0.33 mg/L TSS: 98 mg/L
National Urban Runoff Program	TKN: 1.179 mg/L TP: 0.201 mg/L TSS: 69 mg/L			TKN: 0.965 mg/L TP: 0.121 mg/L TSS: 70 mg/L
USGS	TKN: 1.7 mg/L (rooftops), 1.4 mg/L (parking lots) TP: 0.09 mg/L (rooftops), 0.21 mg/L (parking lots) TSS: 24 mg/L (rooftops), 138 mg/L (parking lots)			
Choe et al.		TKN: 5.07 mg/L		
Hope et al.	Nitrate: 1.1 mg/L	Nitrate: 1.0 mg/L		
Passeport & Hunt	TKN: 0.38-1.37 mg/L			

Consistent with elevated concentrations in pollutant discharges, these land uses have been shown to generate large annual nitrogen, phosphorus, and sediment loadings as well. Shaver et al., based on data collected by Burton and Pitt, found that commercial areas typically discharge 6.7 pounds per acre per year (lbs/ac-yr) of TKN, 1.5 lbs/ac-yr of total phosphorus, and 1000 lbs/ac-yr of TSS; parking lots discharge 5.1 lbs/ac-yr of TKN, 0.7 lbs/ac-yr of total phosphorus, and 400 lbs/ac-yr of TSS; industrial areas discharge 3.4 lbs/ac-yr of TKN, 1.3 lbs/ac-yr of total phosphorus, and 670 lbs/ac-yr of TSS; and shopping centers discharge 3.1 lbs/ac-yr of TKN, 0.5 lbs/ac-yr of total phosphorus, and 440 lbs/ac-yr of TSS.[86] By comparison, average loadings of phosphorus and TSS from undeveloped park land were found to be 0.03 lb/ac-yr and 3 lbs/ac-yr, respectively (no data were available for TKN loadings in this study).[87] An earlier report recommended annual unit nitrogen loads of 11.2 kilograms per hectare per year (kg/ha-yr) from commercial land use and 7.8 kg/ha-yr from industrial land use, compared to 0.22 kg/ha-yr from open (undeveloped) land.[88] For phosphorus, the same study recommended annual unit loads of 3.4 kg/ha-yr from commercial land and 2.2 kg/ha-yr from industrial land, compared to 0.04

[86] Shaver et al., *Fundamentals of Urban Runoff Management* (2007), *supra* note 27, at 3-63; Burton and Pitt, *Stormwater Effects Handbook*, *supra* note 69, at Table 2.5.
[87] Burton and Pitt, *Stormwater Effects Handbook*, *supra* note 69, at Table 2.5.
[88] J. Marsalek, National Water Research Institute, Canada Centre for Inland Waters, *Pollution Due to Urban Runoff: Unit Loads and Abatement Measures* at Table 7 (1978), *available at* http://agrienvarchive.ca/download/PLUARG_pollution_urban_runoff.pdf.

kg/ha-yr from undeveloped land.[89] And for suspended solids, the study recommended annual unit loads of 560 kg/ha-yr from commercial land and 672 kg/ha-yr from industrial land, compared to 11.2 kg/ha-yr from undeveloped land.[90]

Another study found median phosphorus loadings of 0.80 kg/ha-yr from commercial sites, compared to 0.11 kg/ha-yr from undeveloped forests.[91] The same report found median total nitrogen (TN) loadings of 5.2 kg/ha-yr from commercial sites, compared to 2.0 kg/ha-yr from forests.[92] It also found median TSS loadings of 805 kg/ha-yr from commercial sites, compared to 86 kg/ha-yr from forests.[93] Another found annual loadings of 15.4 lbs/ac-yr of nitrogen and 2 lb/ac-yr of phosphorus from parking lots, compared to 2.0 lb/ac-yr of nitrogen and 0.5 lb/ac-yr of phosphorus from undeveloped meadows (no data were available for sediment loadings in this study).[94] EPA Region 1 has used an annual phosphorus loading rate from commercial and industrial sites of 1.15-2.29 lb/ac-yr for purposes of designating impervious areas for regulation (compared to a 0.10-0.13 lb/ac-yr loading rate for forest and open space).[95] A study of aggregate runoff from parking lots in a particular county found that nitrogen loadings from these parking lots were 6,930 pounds, phosphorus loadings were 1,654 pounds, and suspended solids were 287,030 pounds, compared to loadings of 1,993 pounds of nitrogen, 562 pounds of phosphorus, and 46,373 pounds of suspended solids before the land became parking lots.[96]

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[89] *Id.*
[90] *Id.*
[91] Shaver et al., *Fundamentals of Urban Runoff Management* (2007), *supra* note 27, at 3-64 (presenting data from Horner 1992).
[92] *Id.*
[93] *Id.*
[94] Tom Schueler, "The Importance of Imperviousness," Center for Watershed Protection, Table 1 (2000), *available at* http://www.cwp.org/online-watershed-library/doc_download/308-the-importance-of-imperviousness.
[95] U.S. EPA Region I, *Residual Designation Pursuant to Clean Water Act—Charles River*, *supra* note 49, at 5.
[96] Amélie Y. Davis et al., "The Environmental and Economic Costs of Sprawling Parking Lots in the United States," *Land Use Policy* 27 (2010) at 259, *available at* http://iesp.uic.edu/Publications/Faculty%20Publications/Davis/Davis_TheEnvironmentalAndEconomicCostsSprawling.pdf.

Table 2: Summary of Pollutant Loadings Documented at CII Sites

Study	Commercial Sites	Industrial Sites	Open Space
Shaver et al. (data from Burton & Pitt)	TKN: 6.7 lbs/ac-yr TP: 1.5 lbs/ac-yr TSS: 1000 lbs/ac-yr	TKN: 3.4 lbs/ac-yr TP: 1.3 lbs/ac-yr TSS: 670 lbs/ac-yr	TP: 0.03 lb/ac-yr TSS: 3 lb/ac-yr
Marsalek	TN: 11.2 kg/ha-yr TP: 3.4 kg/ha-yr TSS: 560 kg/ha-yr	TN: 7.8 kg/ha-yr TP: 2.2 kg/ha-yr TSS: 672 kg/ha-yr	TN: 0.22 kg/ha-yr TP: 0.04 kg/ha-yr TSS: 11.2 kg/ha-yr
Horner	TN: 5.2 kg/ha-yr TP: 0.80 kg/ha-yr TSS: 805 kg/ha-yr		TN: 2.0 kg/ha-yr TP: 0.11 kg/ha-yr TSS: 86 kg/ha-yr
Schueler	TN: 15.4 lbs/ac-yr TP: 2.0 lbs/ac-yr (parking lots)		TN: 2.0 lb/ac-yr TP: 0.5 lb/ac-yr
EPA Region I	TP: 1.15-2.29 lb/ac-yr	TP: 1.15-2.29 lb/ac-yr	TP: 0.10-0.13 lb/ac-yr

To summarize, the aggregate of stormwater pollution research consistently supports the irrefutable conclusion that CII land uses typically generate pollutant loadings many times greater than loadings from undeveloped land. According to EPA-accepted data, commercial sites generate phosphorus loadings that are 50 times greater than loadings generated by undeveloped open space; parking lots generate phosphorous loadings 23 times greater; industrial sites generate phosphorus loadings 43 times greater; and shopping centers generate phosphorus loadings 16 times greater.[97] EPA Region I has also relied on data indicating that commercial and industrial sites generate phosphorus loadings 9 to 23 times greater than undeveloped open space.[98] While fewer data sources present relative nitrogen loadings, available information suggests that commercial sites generate nitrogen loadings 50 times greater than undeveloped land, while industrial sites generate nitrogen loadings 35 times greater.[99] Finally, EPA-accepted data indicate that commercial sites generate TSS loadings that are over 330 times greater than loadings generated by undeveloped open space; parking lots generate TSS loadings over 130 times greater; industrial sites generate TSS loadings over 160 times greater; and shopping centers generate TSS loadings about 150 times greater.[100] These results indicate that CII sites typically generate nitrogen, phosphorus, and sediment loadings that are, conservatively, at least an order of magnitude greater than loadings from undeveloped land.

When this information was presented in the 2013 Petitions, EPA agreed that "impervious cover is a source of pollutants."[101] And for purposes of those petitions, EPA accepted "that

[97] Shaver et al., *Fundamentals of Urban Runoff Management* (2007), *supra* note 27, at 3-63; Burton and Pitt, *Stormwater Effects Handbook*, *supra* note 69, at Table 2.5; U.S. EPA Region I, *Residual Designation Pursuant to Clean Water Act—Charles River*, *supra* note 49, at 5.
[98] U.S. EPA Region I, *Residual Designation Pursuant to Clean Water Act—Charles River*, *supra* note 49, at 5.
[99] Marsalek, *supra* note 88, at Table 7.
[100] Shaver et al., *Fundamentals of Urban Runoff Management* (2007), *supra* note 27, at 3-63; Burton and Pitt, *Stormwater Effects Handbook*, *supra* note 69, at Table 2.5.
[101] Enclosure to letter from Shawn Garvin, Regional Administrator, U.S. EPA Region 3, to Jon Devine, Natural Resources Defense Council, at 5 ("EPA Region III's Evaluation of the Petition Submitted by American Rivers, the

many CII sites have significant amounts of impervious surface, which are exposed to a variety of pollutants that can discharge during rain events."[102] As such, "EPA agree[d] that it is reasonable to expect that the pollutants identified in the petition [including nitrogen and phosphorus] may be exposed to precipitation at CII sites with impervious cover."[103] Further, EPA noted that when the agency was considering additional categories of stormwater discharges for potential permitting under the Phase II stormwater program, it considered NSQD data, indicating that the agency considers the NSQD to be a reputable data source.[104]

II. Stormwater Discharges from CII Sites Contribute to Water Quality Impairment in the Back River Watershed

After nitrogen, phosphorus, and sediment are exposed to precipitation at CII sites, stormwater runoff carries those pollutants into streams within the Back River watershed and ultimately the Back River estuary itself, contributing to violations of water quality standards. According to Maryland's biennial water quality assessments, the entire Back River watershed is currently impaired by nutrients (nitrogen and phosphorus) and sediments typically contained in runoff from CII sites. GIS data confirm that a significant percentage of the watershed is occupied by CII sites and that a significant portion of CII land area is located within close proximity to the receiving water. Altogether, this information demonstrates that discharges from CII sites are contributing to violations of water quality standards in the Back River watershed.

i. Prior EPA discussions of when a discharge "contributes to a violation of a water quality standard"

EPA has interpreted what it means for a discharge to "contribute to a violation of a water quality standard" in at least three contexts: in responding to the 2013 Petitions, in proposing to designate new MS4s in New Mexico, and in proposing modified conditions for MS4 permits in New Hampshire. (The petitioners do not concede that these interpretations are legally correct, but present them here to provide context for the factual support contained in this petition.)

In responding to the 2013 Petitions, EPA determined whether the discharges at issue contributed to water quality standard exceedances by evaluating two sources of information. First, EPA considered geographic information system (GIS) data. Regions 3 and 9 stated that it is important to use such data "to assess the location of the CII sites relative to the impaired waters."[105] Region 3 performed a GIS analysis that focused on "highly impervious" (CII) sites

Conservation Law Foundation and NRDC Dated July 10, 2013") (Mar. 12, 2014) (hereinafter "Region 3 Response").
[102] *Id.*
[103] *Id.* at 6.
[104] *Id.* at 5.
[105] *Id.* at 8; *see also* Enclosure to letter from Jared Blumenfeld, Regional Administrator, U.S. EPA Region 9, to Jon Devine, Natural Resources Defense Council, at 7 (Mar. 12, 2014) (hereinafter "Region 9 Response").
Region 9 at 7.

located within a half-mile of an impaired stream.[106] Second, EPA considered TMDL source assessments. Regions 3 and 9 stated, "The most relevant and readily available data to assess whether CII sites are contributing to particular WQS exceedances are Total Maximum Daily Load (TMDL) analyses."[107] According to Region 9, "[T]he source assessments that accompany the TMDLs provide useful insights into determining whether CII sites in particular, or alternatively, urban runoff more generally, is contributing to the impairments."[108] More generally, Regions 3 and 9 indicated that a "watershed-specific analysis" can be used "to identify which source or sources contribute to an exceedance of water quality standards."[109]

In proposing to designate new MS4s for NPDES permitting in New Mexico, Region 6 described how it determined whether the discharges at issue were contributing to water quality impairments. Because the discharges "contain pollutants for which the state of New Mexico has listed receiving waters as impaired," Region 6 determined that "these discharges are at least contributing to the associated water quality impairments."[110] Region 6 additionally cited assessments by the state of New Mexico attributing the impairments to "urban-related causes."[111]

Finally, in proposing modified conditions for MS4 permits in New Hampshire, Region 1 performed a literature review and analysis of NSQD data to "reasonably assume" that stormwater discharges from urban areas contain certain pollutants at expected average concentrations.[112] Region 1 went on to state:

> When a waterbody is found to be impaired pursuant to Clean Water Act (CWA) Section 303(d) or 305(b) for a particular pollutant, or the receiving water is experiencing an excursion above water quality standards due to the presence of a particular pollutant, it indicates that the waterbody has no assimilative capacity for the pollutant in question. EPA reasonably assumes that urban stormwater discharges from urbanized areas in New England contain bacteria/pathogens, nutrients, chloride, sediments, metals, and oil and grease (hydrocarbons) and *finds that MS4 discharges are likely causing or contributing to the excursion above water quality standards when the receiving waterbody impairment is caused by bacteria/pathogens, nutrients, chloride, metals, sediments or oil and grease (hydrocarbons)*. EPA has determined that it is appropriate to require additional controls on such discharges to protect water quality.[113]

This statement indicates that EPA accepts average pollutant concentration and loading data as evidence that a category of stormwater discharges is causing or contributing to violations of

[106] Region 3 Response, *supra* note 101, at 9.
[107] Region 3 Response, *supra* note 101, at 7; Region 9 Response, *supra* note 105, at 6.
[108] Region 9 Response, *supra* note 105, at 7.
[109] Region 3 Response, *supra* note 101, at 7; Region 9 Response, *supra* note 105, at 6.
[110] U.S. EPA Region VI, *Los Alamos County Preliminary Designation Document*, *supra* note 49, at 1.
[111] *Id.* at 8.
[112] EPA Region 1, New Hampshire MS4 Statement of Basis, *supra* note 30, at 2.
[113] *Id.* at 2-3 (emphasis added).

water quality standards, and that the agency considers such evidence sufficient to support the imposition of NPDES permit obligations on those stormwater sources.

ii. Back River is impaired for nitrogen, phosphorus, and sediment

The Back River watershed is currently failing to meet water quality standards for nitrogen, phosphorus, and sediment. Maryland's 2012 Integrated Report of Surface Water Quality lists the Back River watershed (segment MD-02130901/MD-BACOH) as impaired for nitrogen, phosphorus, and TSS.[114] The tidal stream segment of the Back River was first identified on Maryland's 1996 303(d) list as being impaired by nutrients due to signs of eutrophication, as well as by suspended sediments.[115] These impairments are included in Maryland's 2014 draft Integrated Report, indicating that the watershed is still failing to meet water quality standards.[116] As such, streams in the watershed are not suitable for their designated uses, which include recreation, fishing, aquatic life, and wildlife uses.[117] Maryland's Integrated Reports attribute the impairments to municipal point source discharges and urban runoff/storm sewers.[118]

iii. Stormwater runoff from CII sites contributes to these impairments

The Maryland Department of the Environment (MDE) developed a total maximum daily load (TMDL) for nitrogen and phosphorus in the Back River. According to the TMDL, urban stormwater contributes over 183,000 pounds of nitrogen and over 20,000 pounds of phosphorus to the watershed each year.[119] The TMDL determined that the sources of nitrogen loads in the watershed, as of the 1995-1997 monitoring period, were 94% municipal wastewater treatment plant discharges, 5% urban stormwater, and 1% non-urban stormwater.[120] The sources of phosphorus loads were 71% municipal wastewater treatment plant discharges, 27% urban stormwater, and 2% non-urban stormwater.[121] However, EPA's decision rationale for approving the TMDL notes that the necessary reductions from the watershed's wastewater treatment plant have already been addressed, due to efforts begun after the baseline monitoring period ended in

[114] Maryland Department of the Environment, *Maryland's Final 2012 Integrated Report of Surface Water Quality* at Parts F.4 &F.7 (2012), *available at* http://www.mde.state.md.us/programs/Water/TMDL/Integrated303dReports/Pages/2012_IR.aspx. While the Chesapeake Bay segment code BACOH is used in the Back River's impairment listings in part F.4 (impaired waters with TMDLs), the Back River has been independently listed as impaired for nitrogen, phosphorus, and sediment since several years before the Chesapeake Bay TMDL was adopted.
[115] Back River TMDL at v.
[116] MDE, *Maryland's Draft 2014 Integrated Report of Surface Water Quality* at Parts F.4 & F.7 (2014), *available at* http://www.mde.state.md.us/programs/Water/TMDL/Integrated303dReports/Pages/2014IR.aspx.
[117] 2012 Integrated Report at Parts F.4 & F.7.
[118] *Id.*
[119] Back River TMDL at Appendix 1, Part D, *available at* http://www.mde.state.md.us/programs/Water/TMDL/ApprovedFinalTMDLs/Documents/www.mde.state.md.us/assets/document/BR_nuts_tmdlappendix1D_final.pdf.
[120] Back River TMDL at 6.
[121] *Id.*

1997, and as a result "reductions assigned in the TMDL are focused on addressing the stormwater contributions now permitted under the MS4 program."[122] Accordingly, the TMDL calls for a 15% reduction in nitrogen and phosphorus loadings from urban stormwater.[123] The urban stormwater wasteload allocation is split between Baltimore County (occupying 40.1% of the urban area in the watershed) and Baltimore City (occupying 59.9% of the urban area).[124]

The TMDL does not discuss the sources of sediment pollution in the watershed, as it only addresses nutrients. However, Maryland's Integrated Reports attribute the Back River watershed's sediment impairment to "urban runoff/storm sewers" without mentioning any other sources.[125]

The TMDL also does not discuss the extent to which particular land uses' stormwater discharges contribute to the Back River watershed's impairments, noting only that "urban" land uses occupied 71.7% of the watershed as of 1997.[126] However, as discussed above, runoff from CII sites consistently contains elevated levels of nitrogen, phosphorus, and sediment. A GIS analysis, attached as Exhibit A and summarized below, shows that a significant proportion of the Back River watershed is occupied by CII land use, and that most of these CII areas are located in close proximity to a receiving water. Because CII sites generate much of the runoff flowing into the Back River, these sites contribute to the watershed's documented exceedances of water quality standards; claiming or acting otherwise would be arbitrary and capricious.

The GIS analysis attached to this petition addresses all land areas whose runoff flows into the Back River or one of its tributary streams. All of these areas are contained within the two HUC-12 watersheds that make up the Back River watershed because no other watersheds lie upstream of them. The GIS analysis reveals that the Back River watershed contains 17 subwatersheds, eight in the Redhouse Creek-Back River HUC-12 (020600030702) and nine in the Back River-Hawk Cove-Chesapeake Bay HUC-12 (020600030703).

In total, 21.6% of the land area in the watershed – over one-fifth of the Back River drainage area – is occupied by CII sites.[127] The vast majority of the land within the watershed (99.1%) is located within two miles of a receiving water – either the Back River or a tributary stream. Of the watershed's CII land area, 53% is within a quarter-mile of a receiving water, and

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[122] EPA Region III, *Decision Rationale: Total Maximum Daily Loads for Back River for Nitrogen and Phosphorus in Baltimore City and Baltimore County, Maryland* at 8 (2005), *available at* http://www.mde.state.md.us/programs/Water/TMDL/ApprovedFinalTMDLs/Documents/Back_NUT_DR.pdf.
[123] Back River TMDL at 26.
[124] *Id.* at Appendix 1, Part D.
[125] 2012 Integrated Report at Part F.7; 2014 Integrated Report at F.7.
[126] *Id.* at 4.
[127] 7,941 acres out of 36,829 total acres in the watershed are CII land, equaling 21.6%. CII sites include the "Commercial," "Industrial," and "Institutional" Maryland LULC categories (*see* footnote 57, *supra*). The GIS analysis does not distinguish between publicly and privately owned sites; this petition only seeks designation of the latter. The analysis in Exhibit A also presents information from the National Land Cover Database's 2011 dataset, which generally corroborates the correlation between urbanized land use and impairment but does not break down land use information sufficiently to distinguish between CII and other land uses.

83% is within a half-mile.[128] Since the Back River nutrients TMDL established that the watershed's nitrogen and phosphorus impairments are caused in part by stormwater runoff from land in the watershed, Maryland's water quality assessments attribute the watershed's sediment impairment to urban stormwater runoff, and GIS analysis demonstrates that over one-fifth of the watershed's land is covered by CII sites, it is indisputable that stormwater discharges from CII sites are contributing to the impairments.

A modeled estimate of average annual pollutant loadings from the urban land uses in the watershed, attached as Exhibit B, confirms that CII sites are responsible for a significant portion of the urban stormwater nutrient loadings to the Back River.[129] This modeling used an approach for calculating regional event mean concentrations (EMCs) using data from the National Stormwater Quality Database that is consistent with methods that EPA itself has used on other occasions, according to documents obtained via a Freedom of Information Act (FOIA) request.[130] The modeling indicates that, out of all urban stormwater sources, sites in CII land use categories contribute at least 46% of TSS loadings, 33% of total phosphorus loadings, and 42% of total nitrogen loadings in the watershed. These percentages are disproportionately high compared to CII sites' land area in the watershed, due to the fact that CII sites generate large per-acre pollutant loadings compared to other land uses, and confirm that the pollutants CII sites generate are contributing to the Back River's impairments.

It is true that certain areas on industrial sites (the portion on which "industrial activity," as defined by EPA regulations, is occurring) are already required to obtain NPDES permit coverage for industrial stormwater discharges, and are therefore excluded from the scope of this petition.[131] As a result, the analysis presented herein overestimates, at least to some extent, the

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[128] 4,233 of 7,941 acres of CII land are within a quarter-mile of a receiving water, equaling 53%. 6,624 of 7,941 acres of CII land are within a half-mile of a receiving water, equaling 83%.

[129] The acreage numbers for the Back River watershed's land uses that are presented in the modeling report (Exhibit B) differ slightly from those presented in the GIS report (Exhibit A). This is because the pollutant modeling in Exhibit B only includes pollutant loadings from urban stormwater sources; agricultural uses and undeveloped land (such as forests and wetlands) were excluded from the analysis. However, because agricultural use occupies a very small fraction of the watershed (552 out of 36,829 acres, or 1.5%), and per-acre loadings from undeveloped lands are relatively low compared to developed lands, this omission does not significantly affect the results. Indeed, the Back River TMDL indicates that only a minuscule fraction of pollutant loadings to the watershed derive from non-urban stormwater sources. Additionally, the CII and non-CII acreage totals presented in Exhibit B differ from those in Exhibit A. This is because the GIS analysis in Exhibit A presents acreage numbers for each land use category as they appear in Maryland's Land Use/Land Cover dataset, while the pollutant modeling in Exhibit B refines those land use categories into subcategories, corresponding to National Stormwater Quality Database land uses, in order to present a more accurate estimate of pollutant loadings. This process is explained in more detail in the memorandum accompanying Exhibit B.

[130] For example, EPA Region I used the NSQD to calculate regional EMCs in developing a protocol for Phosphorus Control Plans as part of the Massachusetts small MS4 general permit. Memorandum from Mark Voorhees, EPA Region 1, to Permit File for Draft Small Massachusetts MS4 General Permit, re: Annual Average Phosphorus Load Export Rates (PLERs) for Use in Fulfilling Phosphorus Load Reduction Requirements in EPA Region 1 Stormwater Permits (Apr. 22, 2014) (on file with petitioners).

[131] EPA regulations require industrial stormwater permit coverage only for the portion of an industrial site where defined "industrial activity" takes place. 40 C.F.R. § 122.26(b)(14) ("The term [industrial activity] excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying

geographic area occupied by *non-NPDES-permitted* CII areas and the pollutant loadings generated by such areas. Information about the percentage of the total area on industrial sites which is subject to the NPDES permitting requirement for industrial stormwater discharges is not publicly available; therefore, it was not possible to subtract the NPDES-permitted areas of industrial sites from the attached analysis. However, it is certain that at least some portions of the industrial sites in the watershed are not required to obtain NPDES permits for post-construction stormwater runoff; along with commercial and institutional sites, those must be designated under EPA's residual designation authority because of their ongoing contributions to the Back River's impairments.

In addition to the well-established pollutant loadings from CII sites, the high imperviousness of such sites further proves their contribution to water quality impairments. EPA has recognized that "the level of imperviousness in an area strongly correlates with the quality of the nearby receiving water."[132] In fact, many studies have shown that watershed imperviousness above 5-10% is significantly correlated with water quality degradation.[133] Moreover, EPA has also recognized "that many CII sites have significant amounts of impervious surface, which are exposed to a variety of pollutants that can discharge."[134] In fact, EPA concluded, based on analysis of various research studies, that "CII sites often have 70% or greater area of

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parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas."). Therefore, impervious areas such as parking lots and rooftops, which typically are not the site of industrial activity but are important sources of urban stormwater pollution, typically are non-NPDES permitted on industrial sites.

[132] Region 3 Response, *supra* note 101, at 7 (quoting 64 Fed. Reg. 68,722, 68,725 (Dec. 8, 1999)).

[133] *See, e.g.*, Glenn E. Moglen, Dep't of Civil & Envtl. Engineering, Virginia Tech, "Limiting Imperviousness to Maintain Ecological Quality: Are Threshold-Based Policies a Good Idea?" (Apr. 23, 2014), *available at* http://www.chesapeake.org/stac/presentations/230_Track%206%20Moglen.pdf ("There is considerable evidence of severe ecological impacts if imperviousness > 10%"); Roy Schiff & Gaboury Benoit, *Effects of Impervious Cover at Multiple Spatial Scales on Coastal Watershed Streams* (June 2007), *available at* http://clear.uconn.edu/projects/tmdl/library/papers/SchiffBenoit_2007.pdf ("We identified a critical level of 5% impervious cover, above which stream health declined. Conditions declined with increasing imperviousness and leveled off in a constant state of impairment at 10%."); Jim Gibbons, University of Connecticut, *Nonpoint Education for Municipal Officials, Technical Paper No. 1: Addressing Imperviousness in Plans, Site Design and Land Use Regulations* (2002), *available at* http://nemo.uconn.edu/publications/tech_papers/tech_paper_1.pdf ("In addition to imperviousness' adverse impacts on water quantity, numerous studies document its water quality impacts with evidence of stream impairment when watershed imperviousness approaches 10 percent."); Karen Cappiella & Kenneth Brown, Center for Watershed Protection, *Impervious Cover and Land Use in the Chesapeake Bay Watershed* at Appendix A (2001), *available at* http://www.cwp.org/online-watershed-library/doc_download/619-impervious-cover-and-land-use-in-the-chesapeake-bay-watershed (literature review "which summarizes 43 studies including recent research that generally confirm the Impervious Cover Model by documenting the impacts of stormwater on streams and receiving waters"); Marjorie Kaplan, NJ Dep't of Envtl. Protection, & Mark Ayers, USGS, *Impervious Surface Cover Concepts and Thresholds* (2000), *available at* https://rucore.libraries.rutgers.edu/rutgers-lib/37001/pdf/1/ ("There is evidence in the scientific literature that there is a link between impervious surface cover and stream ecosystem impairment, some researchers have suggested that impairment begins to be significant at approximately 10-percent impervious surface cover…"). All of these documents were included in the administrative record for EPA's response to the 2013 Petitions.

[134] Region 3 Response, *supra* note 101, at 7.

imperviousness associated with them."[135] Based on EPA's 70% imperviousness estimate, CII sites *alone* likely cover approximately 15% of the Back River watershed with impervious surface (70% of the 21.6% of the watershed occupied by CII land use) – well above the 5-10% impairment-causing imperviousness threshold documented by decades of scientific research. This fact corroborates the conclusion already established by average pollutant loading data: CII sites in the Back River watershed contribute to the watershed's nutrient and sediment impairments.

Aside from the pollutant contributions of CII sites relative to those of other land uses currently present in the watershed, the contributions of such sites relative to the original natural condition of the watershed also provide evidence that these sites are contributing to the Back River's impairments. As discussed above, CII sites typically generate nutrient and sediment loadings that are at least an order of magnitude greater than loadings from undeveloped land. As a result, based on this conservative estimate, CII sites in the Back River watershed – which occupy over 20% of the land area – are *alone* contributing triple the nutrient and sediment loadings that the estuary would be receiving from the *entire* watershed under natural conditions.[136] This massive pollutant increase compared to background loadings is additional reason to conclude that CII sites have a significant impact on the Back River's water quality, causing it to become degraded from its natural condition.

III. No Ongoing Programs Are Adequately Addressing the Contributions of CII Site Discharges to the Back River Watershed's Impairments

As discussed above, the petitioners reject the premise that the existence of ongoing stormwater regulatory programs is a permissible factor for EPA to consider when deciding whether to exercise RDA. The Clean Water Act explicitly states that EPA *must* require a NPDES permit for any stormwater discharge that contributes to a violation of a water quality standard.[137] Neither the statute nor EPA's implementing regulations give the agency the discretion to decline to designate a discharge for permitting based on other factors beyond the discharge's contribution to impairment. Unless the stormwater discharge in question is already directly regulated by a NPDES permit – i.e., the discharger is itself a permittee with legal obligations to reduce pollution – the existence of any other ongoing regulatory programs is legally irrelevant. The existence of other programs is also irrelevant from a practical perspective because those programs are not necessarily targeted toward achieving water quality standards in the Back River. RDA is the most appropriate tool for attaining water quality standards in this

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[135] *Id.* at 8; *see also* EPA Region 3, *Rationale for 70% Impervious Surface Indicator Used in the RDA Petition Response* (2014).

[136] If a given land use generates pollutant loadings that are an order of magnitude (10 times) greater than loadings from undeveloped land, then that land use, occupying 10% of a watershed, will generate the same amount of pollution that the entire watershed (100%) would generate under natural conditions. In other words, replacing 10% of an undeveloped watershed with the given land use will roughly double the watershed's pollution loadings; replacing 20% will roughly triple the loadings; and so forth.

[137] 33 U.S.C. § 1342(p)(2)(E).

watershed because it can be tailored to address the specific discharges from the categories of sites that are contributing to the river's particular impairments. RDA is also a superior approach to other existing efforts because applying permitting requirements to all contributing sources would result in a more equitable distribution of responsibility. However, because EPA considered this factor in responding to the 2013 Petitions, the petitioners address it here, without in any way conceding that doing so is necessary or pertinent.[138]

i. Municipal separate storm sewer system (MS4) permitting

The Back River watershed is located within Baltimore City and Baltimore County, both of which are regulated by the state of Maryland via NPDES municipal separate storm sewer system (MS4) permits.[139] The two permits are virtually identical. They require each jurisdiction to take certain steps to manage the stormwater runoff discharged through their MS4s. However, for two principal reasons, the permits do not sufficiently control CII site discharges, nor are they an adequate substitute for direct NPDES regulation of private CII sites.

First, the permits impose no legal obligations on the owners of privately owned CII sites to take any steps whatsoever to reduce the amounts or concentrations of nutrients and sediments discharged from their properties. This is because the city and county, not private landowners, are the permittees covered by the permits.

Second, the permits' requirements for the two jurisdictions do not obligate them to reduce pollution from private CII sites in the Back River watershed. While Part III of the permits purportedly requires the city and county to prohibit pollutants as necessary to comply with water quality standards and to attain applicable wasteload allocations for approved total maximum daily loads, the permits go on to state: "Compliance with all the conditions contained in PARTs IV through VII of this permit shall constitute . . . adequate progress toward compliance with Maryland's receiving water quality standards and any EPA approved stormwater WLAs [wasteload allocations] for this permit term."[140] In other words, the jurisdictions are under no independent obligation to comply with water quality standards or attain wasteload allocations as

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[138] In its response to the 2013 Petitions, EPA noted that the U.S. Court of Appeals for the Ninth Circuit previously upheld EPA's consideration of this factor when it decided which categories of stormwater discharges to regulate as part of the Phase II rule in 1999. However, that ruling does not justify the use of this factor in the RDA context; the considerations relevant to deciding whether to regulate a broad nationwide category of sites are not necessarily relevant to the residual designation of a discrete set of sites that are contributing to a known water body impairment.

[139] MDE, NPDES Permit No. 11-DP-3315 MD0068292 for Baltimore City (Dec. 27, 2013), *available at* http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram/Documents/Baltimore%20City%20Final%2012%2019%202013%20Permit.pdf; MDE, NPDES Permit No. 11-DP-3317 MD0068314 for Baltimore County (Dec. 23, 2013), *available at* http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram/Documents/Baltimore%20Co%20Final%20Permit%20incl%20Attachments.pdf. The two permits will hereinafter be referred to collectively as "MS4 Permits."

[140] MS4 Permits at III.

long as they implement the management measures specified in the permits (and in their MDE-approved restoration plans, discussed below).[141]

In order to satisfy their obligations under the permits, Baltimore City and Baltimore County are required to implement certain stormwater management programs described in the permits and to develop and implement "restoration plans" for attaining stormwater WLAs. The stormwater management programs described in the permits do not require any pollutant reductions from privately-owned CII cites. These programs cover six topics: post-construction stormwater management; erosion and sediment control; illicit discharge detection and elimination; trash and litter; management and maintenance of county-owned property; and public education.

- The permits require the city and county to implement Maryland's stormwater regulations for new development and redevelopment.[142] Those regulations are discussed in more detail below, but they do not require pollution reductions from the *existing* CII sites that already occupy a significant percentage of the Back River watershed. The permits' post-construction provisions also require the jurisdictions to conduct preventative maintenance inspections of all stormwater management practices on a triennial basis, but do not otherwise require practices to be used at existing developed sites if they are not already in place.[143]

- The permits' erosion and sediment control requirements apply only during the construction phase and do not require long-term stormwater controls at CII sites.[144] Likewise, neither the permits' trash and litter provisions nor their municipal facility maintenance provisions contain requirements applicable to private CII discharges.[145]

- Illicit discharge requirements relate to non-stormwater discharges to the MS4 and therefore have no impact on stormwater discharges from CII sites.[146]

- Finally, the public education component of the permits requires the jurisdictions to provide information to private landowners that could theoretically cause them to reduce pollution from CII properties, but such reductions are neither required

[141] The petitioners do not concede or otherwise agree that the lack of such an obligation is lawful under the Clean Water Act.
[142] MS4 Permits at IV.D.1.a.
[143] *Id.* at IV.D.1.d.
[144] *Id.* at IV.D.2.
[145] *Id.* at IV.D.4-5.
[146] *Id.* at IV.D.3.

> nor guaranteed, and the effectiveness of public outreach measures is generally unknown.[147]

In addition to implementing these stormwater management programs, Baltimore City and Baltimore County are also required to develop and implement "restoration plans" designed to attain stormwater WLAs, including schedules for implementing projects and final dates for meeting WLAs.[148] Both jurisdictions have submitted draft plans to MDE; these plans supersede the previously developed Small Watershed Action Plans for the Back River watershed that had been developed in 2008 and 2010.[149] Neither of the draft restoration plans proposes to take any action specifically to address runoff from privately-owned CII sites. Baltimore City's draft plan proposes to implement stream restoration projects, increased street sweeping, and retrofitting of public property such as schools and road right-of-way, without directly addressing how pollutant loads could be reduced from private property.[150] Baltimore County's draft plan states that the county will "install retrofits at feasible sites" to mitigate runoff from 4,200 acres over 10 years, but does not indicate whether these sites will be public or private or what land use categories the county will target.[151] As a result, neither plan commits the jurisdictions to implementing retrofits at any private CII sites whatsoever. Moreover, neither plan is actually sufficient to ensure compliance with water quality standards in the Back River. The reasons for the deficiencies are explained in the comments that Blue Water Baltimore submitted on Baltimore City's draft plan, attached as Exhibit C; while the comments do not address Baltimore County's plan, both are insufficient for similar reasons. Among other defects, the plans lack acceptable implementation schedules and fail to demonstrate that proposed projects and programs will achieve wasteload allocations. As a result, these plans do not adequately control *either* the CII discharges *or* the total stormwater discharges that are contributing to impairments in the watershed.

Additionally, as part of the permits' "restoration" requirement, the jurisdictions must also "commence and complete the implementation of restoration efforts for twenty percent of [their] impervious surface area" over the five-year permit term.[152] These "restoration efforts" may include either the implementation of new stormwater retrofit practices or the retrofit of structural

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[147] *Id.* at IV.D.6.
[148] *Id.* at IV.E.2.
[149] *See* Baltimore County, *Upper Back River Small Watershed Action Plan* (2008) & *Tidal Back River Small Watershed Action Plan* (2010), *both available at* http://www.baltimorecountymd.gov/Agencies/environment/watersheds/backmain.html.
[150] City of Baltimore, Clean Water Baltimore, & Baltimore City Dep't of Public Works, *Baltimore City MS4 Restoration and TMDL WIP* (Dec. 2014), *available at* http://www.cleanwaterbaltimore.org/dec2014/MS4-WIP-12-19-14-Final.pdf. The plan was subsequently revised, but without addressing petitioners' primary concerns. City of Baltimore, Clean Water Baltimore, & Baltimore City Dep't of Public Works, *Baltimore City MS4 Restoration and TMDL WIP* (Aug. 2015), *available at* http://www.cleanwaterbaltimore.org/August_2015/Baltimore%20City%20MS4%20and%20TMDL%20WIP%20Rev%20August%202015.pdf.
[151] Baltimore County Dep't of Environmental Protection & Sustainability, *Baltimore County TMDL Implementation Plan – Nutrients in Back River* at 9-14 (Nov. 2014).
[152] MS4 Permits at IV.E.2.a.

practices (i.e., detention ponds) installed prior to 2002. Nothing in the permits requires the jurisdictions to include private CII sites in their "restoration efforts," nor have they shown this requirement to be sufficient to eliminate stormwater's contribution to the identified impairments.

In sum, nothing in the Baltimore City and Baltimore County MS4 permits requires the two jurisdictions to reduce pollution from existing, privately owned CII sites.

ii. State and local development regulations

Maryland's stormwater regulations establish stormwater control requirements for private land development activities, including CII sites. These regulations apply to new development and redevelopment activities disturbing 5,000 square feet or more.[153] Sites subject to the rules must treat the water quality volume, defined as the runoff generated by a 1-inch storm event, using environmental site design practices to the maximum extent practicable (or structural practices after ESD opportunities have been exhausted).[154] "Treatment" of the water quality volume means that runoff must be managed using practices with a minimum pollutant removal efficiency (80% for TSS and 40% for TP).[155] The regulations impose additional peak rate discharge limitations for flood control purposes, but these have no water quality component.[156]

Redevelopment projects are subject to a lower standard than new development projects, having only to reduce the site's existing impervious area by 50% or to treat the water quality volume from 50% of the site's impervious area using environmental site design to the maximum extent practicable.[157] Baltimore City and Baltimore County have adopted local regulations that incorporate the statewide requirements, without requiring more.[158]

GIS data indicate that the area surrounding the Back River and its tributary streams is already almost fully developed. Thus, it is unlikely that any future development will occur in the watershed that will be required to meet the new development standard; rather, the lower redevelopment standard will typically apply.

In addition, very little of the existing development in the watershed was built to the current regulatory standard for new development. The requirement for new development to treat the water quality volume was first adopted in 2000, with the requirement to use environmental site design added when updated regulations were adopted in 2009.[159] (The other major change made in the 2009 regulations was an increase in the redevelopment standard; from 2000 to 2009,

[153] Md. Code Regs. 26.17.02.05(B)(2).
[154] Md. Code Regs. 26.17.02.06(A).
[155] MDE, *2000 Maryland Stormwater Design Manual* at 1.13 (2000, revised 2009), *available at* http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram/MarylandStormwaterDesignManual/Pages/Programs/WaterPrograms/SedimentandStormwater/stormwater_design/index.aspx.
[156] *Id.*
[157] Md. Code Regs. 26.17.02.05(D)(1).
[158] Balt. City Code Art. 7 §§ 21-6, 22-3, 23-7; Balt. Co. Code §§ 33-4-104, 33-4-105, 33-4-106.
[159] *See* MDE, "Maryland's Stormwater, Sediment Control and Dam Safety Program: Stormwater Management Update" at 3, http://www.srbc.net/programs/docs/wqac101310mdestormwater.pdf.

redevelopment sites had to manage or reduce only 20% of their impervious area instead of the current 50%.[160]) Before 2000, Maryland's original stormwater management program – adopted in the mid-1980s – focused on flood control and did not include any guidelines or design criteria aimed at protecting water quality.[161] Prior to that program, stormwater runoff from development was not regulated in Maryland.

Baltimore County's draft restoration plan for the Back River watershed, developed pursuant to the county's MS4 permit (discussed above), contains information about recent land use changes in the county's portion of the watershed. According to the plan, 18,342 acres of the watershed area within the county were occupied by urban land use in 1997; by 2011 that figure had risen slightly to 18,555 acres.[162] "Urban impervious" land rose from 5,472 acres in 1997 to 6,240 in 2011, an increase of 768 acres; the plan does not state how much of this increase was due to new development versus redevelopment.[163] Conservatively, then, no more than 12% of the existing impervious surfaces in Baltimore County's portion of the Back River watershed (768 out of 6,240 acres) were required to manage their stormwater runoff to the water quality volume. (In reality, the amount of impervious surface meeting that requirement is very likely less than 12%, as some of the increased acreage was almost certainly added through redevelopment, some was added between 1997 and the adoption of the water quality treatment requirement in 2000, and some was likely added due to projects under 5,000 square feet that were not subject to any requirements at all.) Baltimore City's plan lacks this type of information, but it confirms that the city is "mostly built-out" and therefore application of the redevelopment standard is far more common than application of the more protective new development standard.[164]

Consequently, only a small percentage of existing CII sites in the Back River watershed have been required to meet the current regulatory standard for new development, and sites smaller than 5,000 square feet have never been subject to any requirements at all. Moving forward, the vast majority of sites in the watershed will be required to meet only the standard for redevelopment, which requires only half the stormwater treatment that the new development standard does. Moreover, even for CII sites in the watershed that have been or will be required to meet the new development standard, the fact that they were or will be designed to treat the full water quality design volume does not guarantee that those sites will not contribute to the Back River's nutrient and sediment impairments. According to documents available in the public record, MDE did not select this standard based on whether it would prevent stormwater runoff from causing or contributing to water quality standard violations in the Back River watershed

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[160] *Id.*

[161] *See* Stewart R. Comstock, P.E. & Charles Wallis, P.E., MDE, *The Maryland Stormwater Management Program: A New Approach to Stormwater Design* (2003), *available at* http://water.epa.gov/polwaste/nps/stormwater/upload/2003_03_26_NPS_natlstormwater03_07Comstock.pdf.

[162] Baltimore County Dep't of Environmental Protection & Sustainability, *Baltimore County TMDL Implementation Plan – Nutrients in Back River*, *supra* note 151, at 5-3 through 5-5.

[163] *Id.*

[164] City of Baltimore, Clean Water Baltimore, & Baltimore City Dep't of Public Works, *Baltimore City MS4 Restoration and TMDL WIP* (Dec. 2014 draft), *supra* note 150, at 5.

specifically, nor did it analyze the extent to which the standard would remediate such violations. As a result, there is no reason to believe that Maryland's stormwater regulations will adequately address the contribution of CII sites to the Back River's impairments.

iii. Voluntary local retrofit programs

In responding to the 2013 Petitions, EPA Region 3 stated that in addition to federal, state, and local stormwater laws, the agency would also take into account the presence of "[v]igorously implemented controls that might otherwise be 'voluntary.'"[165] However, no voluntary local government retrofit programs (i.e., no retrofit programs beyond what the Baltimore City and Baltimore County MS4 permits require) could be identified in the Back River watershed. Moreover, voluntary programs that, by definition, have no enforceability cannot possibly substitute for enforceable permit requirements under residual designation.

Conclusion

In conclusion, the Clean Water Act places EPA under a non-discretionary duty to exercise residual designation authority over non-NPDES-permitted commercial, industrial, and institutional sites in the Back River watershed. The Back River is impaired because of nutrient and sediment pollution commonly found in runoff from CII sites. All available evidence strongly indicates that CII sources contribute to violations of water quality standards in this watershed. No existing regulatory programs are adequately addressing these sources' contribution to the impairments. Fulfilling EPA's statutory obligation and designating these sites for permitting will assist Baltimore City and Baltimore County in meeting their regulatory obligations and achieving a fishable, swimmable waterway for the residents of the Back River watershed.

[165] Region 3 Response, *supra* note 101, at 5.

Respectfully submitted,

AMERICAN RIVERS
NATURAL RESOURCES DEFENSE COUNCIL

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