Jan. 21, 2021

Mr. Raymond Bahr
Maryland Department of the Environment
Water and Science Administration
1800 Washington Blvd., STE 440
Baltimore, MD 21230

RE: Draft NPDES Permit No. 20-DP-3315 MD0068292

Dear Mr. Bahr:

Thank you for this opportunity to comment on the draft National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) discharge permit for Baltimore City ("Draft Permit"). We understand that this Draft Permit is an important part of Maryland's effort to protect the Chesapeake Bay.

This comment is submitted on behalf of the Farm Alliance of Baltimore, a membership organization of urban farms, neighborhood growers, and friends. Our members help contribute to Baltimore City's goal of restoring impervious surface by reclaiming abandoned properties and converting paved and compacted surfaces into permeable soils fit for growing food, livestock, and fiber. As such, we feel it is important for the Maryland Department of the Environment (MDE) to acknowledge, in the form of a response to this comment, that urban agriculture[1] falls under the Impervious Surface Reduction (IMPP) Alternative Best Management Practice (BMP).[2]

[1] The precise definition of urban agriculture varies depending on the source. The Baltimore City Code defines urban agriculture as "the cultivation, processing, and marketing of food, with a primary emphasis on operating as a business enterprise." Balt. City Code, Article 32 § 1-314(h).

[2] Maryland Department of the Environment (MDE), in Maryland's Final Phase III Water Implementation Plan (WIP) report, has recognized that many traditional agricultural BMPs provide environmental benefits and reductions in stormwater. On a city level, urban agriculture has many of the same environmental benefits as traditional agricultural BMPs as recognized by MDE. Maryland's Final Phase III WIP lists a current WIP strategy as agricultural BMP's because "[m]any traditional agricultural BMP's provide environmental benefits beyond water quality. Practices such as residue and tillage management, cover crops, crop rotations, composting, riparian buffers, biomass plantings, and rotational grazing, among others support and enhance soil health. These practices increase organic matter, sequester carbon in the soil, reduce soil erosion, promote nutrient cycling, improve water retention, and reduce competition from weeds and pests." Maryland's Final Phase III WIP Published August 23, 2019. The benefits from traditional agricultural BMP's, which are the same benefits as urban agriculture, directly meet the needs highlighted in Baltimore City's 2020 MS4 Permit, specifically in regard to erosion and sediment control, reducing pollutants associated with the maintenance of City-owned properties, and reducing the number of Nutrient Credits needed for Total Nitrogen (TN), Total Phosphorus (TP), and Total Suspended Solids (TSS) in accordance with COMAR 26.08.11 to meet its impervious acre restoration requirement as laid out in Part IV.E.3 of the permit. Baltimore, MD. *Phase I Large MS4 Permit* (Oct. 23, 2020. Urban farms are able to implement, or already follow, the following programs to reduce the use of pesticides, herbicides, fertilizers, and other pollutants associated with vegetation management which are listed in Part 4.c.iii of the permit. (Such programs include "Developing and implementing an Integrated Pest Management Plan according to EPA guidelines; Custom fertilizer property management plans based on soil testing; Targeted application or "spot application" of pesticides; Alternative and organic fertilizers; Manual weed removal, mowing, and trimming; Annual training and applicator certification and

Maryland's Environment Article, Title 4, Subtitle 2 requires MDE to adopt rules and regulations which establish criteria for stormwater management in Maryland.[3] Those rules and regulations must among other things: specify the minimum content of the local [stormwater] ordinances or rules and regulations of the affected county governing body to be adopted and specify the exemptions a county or municipality may grant from the requirements of submitting a stormwater management plan.[4] Maryland state law also requires counties and municipalities to adopt the ordinances necessary to implement a stormwater management program.[5] In addition, Maryland law specifies the local stormwater management design criteria, and requires stormwater management plans to be consistent with MDE requirements established under title 4, subtitle 2, section 3 of Maryland's Environment Article, which requires MDE to specify the minimum requirements for inspection and maintenance of stormwater practices.[6] MDE's Maryland's 2000 Stormwater Design Manual provides guidance for local stormwater management plan criteria, and sets out general performance standards for BMPs.[7] While MDE states that the BMPs contained in the 2000 Stormwater Design Manual are not exclusive, new or proposed BMPs must be approved by MDE by meeting the performance criteria in the 2000 Stormwater Design Manual.[8] As part of Baltimore City's stormwater management program, the draft MS4 requires impervious surface reductions through use of BMPs.[9] Under the Baltimore City Code, BMP is defined as "a structural or nonstructural practice designed to store temporarily or treat stormwater runoff in order to mitigate flooding, reduce pollution, and provide other amenities."[10] The draft MS4 lists MDE approved BMPs in Appendix C, which

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licensing as required by Maryland Department of Agriculture to ensure accurate application of chemicals according to manufacturer's recommendations; Subcontracting to a certified pest control applicator licensed business for some or all of properties; Piloting biological pest control programs; and Establishing "no mow" areas.") Baltimore, Md. *Phase I Large MS4 Permit* (Oct. 23, 2020. Urban farms may also qualify for Urban Soil Restoration Credits as urban agriculture can enhance "the porosity of soils compacted by human activity in urban areas." Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated: Guidance for National Pollutant Discharge Elimination System Stormwater Permits, Maryland Department of the Environment (June 2020). "Soil restoration may be used to correct compacted pervious soils that have some, little, or no vegetation, or soils under impervious areas [such as vacant lots] that have been removed. *Id.* Urban farms may also qualify for rainwater BMPs. Baltimore, Md. *Phase I Large MS4 Permit*, Appx. C (Oct. 23, 2020). Additionally, in Prince George's County 2018 Annual NPDES MS4 Report, which was prepared for MDE Water Management Administration, Prince George's County held urban gardening and farming and urban gardening as activities and events that satisfied the following MS4 permit conditions: "Increasing water conservation; Residential and community stormwater management implementation and facility maintenance; Proper erosion and sediment control practices; Increasing proper disposal of household hazardous waste; Improving lawn care and landscape management (e.g., the proper use of herbicides, pesticides, and fertilizers, ice control and snow removal, cash for clippers, etc.); Residential car care and washing; and Proper pet waste management." Prince George's County 2018 Annual NPDES MS4 Report, Prince George's County Department of the Environment (2018). Urban agriculture, including urban farming and gardening, in Baltimore City would satisfy the similar, if not the same, MS4 permit conditions for the Baltimore City NPDES MS4.

[3] MD. CODE ANN., Envir. § 4-203(b) (2020).
[4] MD. CODE ANN., Envir. §§ 4-203(b)(4),(5)(i) (2020).
[5] MD. CODE ANN., Envir. § 4-202 (2020) .
[6] MD. CODE ANN., Envir. § 4-202 (2020).
[7] MDE, *Maryland 2000 Stormwater Design Manual*, Ch. 1 at 1.2 (May, 2009).
[8] *Id.*
[9] BALTIMORE, Md. *Phase I Large MS4 Permit*, at 10 (Oct. 23, 2020).
[10] BALTIMORE, MD., CITY CODE art. 7 §21-1(c).

includes "Micro-Scale Practices" such as: "Rainwater Harvesting" and "Rain Gardens."[11] In addition, Appendix C of the draft MS4 lists "Alternative BMPs" including: "Mechanical Street Sweeping," "Impervious Surface Reduction," and "Stream Restoration."[12] Urban Agriculture activities should be recognized as falling under the umbrella BMP category of "Impervious Surface Reduction." MDE has the authority to add "urban agriculture" to the BMP category of "Impervious Surface Reduction" because they are the agency responsible for approval of new or proposed alternative best management practices.[13]

Below we will outline the reasons we believe that urban agriculture should be formally acknowledged as part of existing BMPs, specifically, the IMPP. We will begin with a discussion of how urban agriculture is an efficient means of achieving impervious surface reduction. We will then discuss the stormwater benefits of urban agriculture based on the available scientific literature. Based on the contents of this comment, we believe MDE will see that urban agriculture is a beneficial stormwater management practice and therefore we ask that MDE acknowledge this in the form of a response to this comment.

I. Urban Agriculture as an Efficient Means of Achieving Alternative Best Management Practice "Impervious Surface Reduction"

Runoff from impervious surfaces is a significant source of pollutants to local rivers, streams and the Chesapeake Bay. This runoff consists of contaminants from vehicles, construction, and residential or commercial activities that are washed from roads, parking lots and sidewalks when it rains or snow melts. A large amount of this pollution is carried directly to our waters. Under the Draft Permit, Baltimore City is tasked with restoring 3,696 impervious acres by the end of the permit period through implementation of stormwater BMPs, programmatic initiatives, or alternative control practices in accordance with the 2020 Accounting Guidance.[14] While Farm Alliance of Baltimore applauds the stormwater control efforts made by both Baltimore City and the State of Maryland, this Draft Permit sets a lofty goal in regards to impervious surface reductions, and is marked by a heavy reliance on BMPs like "street sweeping."[15] Farm Alliance of Baltimore strongly encourages MDE to lead the way in considering urban agriculture as a more efficient means in reducing impervious surfaces.

Urban Agriculture can be a sustainable mechanism to achieve Baltimore's stormwater reduction goals by transforming impervious, city-owned vacant lots, into pervious acreage, with vegetation and cover crop in the offseason to ensure stormwater and sediment control. Urban Agriculture activities can also provide a unique opportunity to implement "Micro-Scale Practices" such as "Rainwater Harvesting" and "Rain Gardens." In Maryland's Phase III Watershed Implementation Plan, MDE recognizes that "agricultural landscapes have been noted for their role in supporting sustainable fisheries, particularly because aquatic stressors arising

[11] BALTIMORE, Md. *Phase I Large MS4 Permit,* Appx. C (Oct. 23, 2020).
[12] *Id.*
[13] MDE, *Maryland 2000 Stormwater Design Manual*, Ch. 1 at 1.2 (May, 2009).
[14] BALTIMORE, Md. *Phase I Large MS4 Permit,* at 10 (Oct. 23, 2020).
[15] BALTIMORE, Md. *Phase I Large MS4 Permit,* Appx. B (Oct. 23, 2020).

from impervious surfaces associated with development is minimized."[16] Additionally, MDE counts cover crop acreage as an agricultural practice that helps achieve statewide Watershed Implementation goals and nutrient reductions for the Chesapeake Bay Total Maximum Daily Load (TMDL).[17]

Sector	Core Phase III WIP Strategies	TN Reduced *(lbs TN EoT/yr)*	TP Reduced *(lbs TP EoT/yr)*	Cost
Agriculture *Maintain Current Practices*	Conservation Technical Assistance *(1 million acres of Conservation Plans + Design & Oversight of all BMP implementation)*	1,100,000	53,000	$13,800,000
	Nutrient Management Compliance	1,600,000	76,000	$3,100,000
	Cover Crops | ***470,000 acres/year***	2,300,000	2,000	$25,500,000/yr
	Manure Transport | ***100,000 tons/year***	228,000	26,000	$2,000,000/yr
Agriculture *Future Practices*	Verification of existing BMPs	87,500	1,500	$3,500,000
	Implementation of Additional BMPs *(The Maryland Agricultural Water Quality Cost-Share (MACS) Program)*	652,000	10,600	$65,100,000

Additionally, Maryland has a cover crop incentive program funded by the Bay Restoration Fund to drive voluntary restoration efforts.[18] Unfortunately, it does not appear that Baltimore has given credit to any urban farms for impervious surface reductions, nor does there appear to be any efforts on behalf of the city to facilitate a stormwater management program that recognizes the net benefits that urban agriculture can provide in controlling erosion and stormwater runoff. Instead, the draft MS4 states that the City plans to achieve impervious surface reductions with an inefficient reliance on "Street Sweeping."[19]Astonishingly, the BMP "Street Sweeping" is planned to account for 1,247 acres of the "Impervious Acres Treated" in year one while "Stream Restoration" accounts for 254 acres treated, and "Impervious Surface Reduction" accounts for a mere 3.4 acres treated.[20]

[16] MDE, Maryland's Final Phase III WIP, Appx. D, at D-4 (Aug. 23, 2019).
[17] MDE, *Maryland's Final Phase III WIP*, at 6, 49 (Aug. 23, 2019).
[18] *Id. a*t 58.
[19] BALTIMORE, Md. *Phase I Large MS4 Permit,* Appx. B (Oct. 23, 2020).
[20] BALTIMORE, Md. *Phase I Large MS4 Permit,* Appx. B (Oct. 23, 2020).

Appendix B
Year 1 BMP Portfolio – New BMPs

BMP NAME	BMP TYPE[1]	NUMBER of BMPs	IMPERVIOUS ACRES TREATED[3]	LENGTH RESTORED (feet)/ LANE MILES (miles)/ MASS LOADING (lbs)[3]
Proposed Restoration for Year 1 of the Reissued Permit				
Annual Practices				
Street Sweeping	VSS	1	1,247[2]	15,029
Capital Projects				
Impervious Surface Reduction	IMPP	14	3.4	N/A
Stream Restoration	STRE	1	254	12,700
Other				
Elimination of Nutrient Discharges	IDDE	TBD	152	N/A

3.4 acres of "Impervious Surface Reduction" is insufficient for a city that has upwards of 17,000 vacant properties, many with impervious surfaces waiting to be transformed.[21] Such a heavy reliance on "Street Sweeping" is a short sighted, unsustainable model for achieving stormwater management, as it requires continual application year by year, and the operation of street sweeping vehicles running on fossil fuels increases toxic air pollutants in already overburdened communities. Our concern with the MS4's heavy reliance on street sweeping as an effective and sustainable stormwater management practice is echoed in Blue Water Baltimore's comment on the draft MS4 permit for Baltimore City.[22] A more sustainable approach would be to invest in low-cost long-term solutions such as urban farms and community gardens, which could raise Baltimore's yearly "Impervious Surface Reduction" acreage into the double digits.

[21] *See* Ethan McLeod, *Under new legislation, each of Baltimore's vacants could soon have its own sign — and QR code*, BALTIMORE BUSINESS JOURNAL, (Sept. 21, 2020), Baltimore City Council approves bill to add signs with QR codes for every vacant property - Baltimore Business Journal (bizjournals.com). Officials estimate the tally of abandoned or uninhabited properties to be around 17,000, though some advocates put the estimate much higher. Carol Ott, a fair-housing advocate who has worked to independently catalog Baltimore's vacant housing stock, says it's likely in the high 20,000s or low 30,000s

[22] *See* Blue Water Baltimore's comment titled *Re: Blue Water Baltimore Comments on Baltimore City and Baltimore County 2020 Draft MS4 Permits* pgs. 3-4 (stating "Interestingly, our 7-year nontidal dataset covers the previous MS4 permit term, suggesting to Blue Water Baltimore that the current approach to stormwater management in Baltimore City, namely street sweeping, is not improving water quality." "Furthermore, it is critical to note that street sweeping is an annual practice - not a permanent solution, requiring the City to continue its prior commitment to street sweeping and add even more "lane miles swept" to achieve compliance with this new draft permit. During the COVID-19 pandemic in 2020, street sweeping in Baltimore City was one of the first services to be substantially curtailed when the Department of Public Works experienced staffing shortages." "We believe our data suggests that substantial changes, [as opposed to annual practices like street sweeping] including greater reliance on stormwater interventions that reduce stormwater volumes, and treat stormwater before it enters our waterways, are necessary if we expect to see future water quality improvements.").

II. Urban Agriculture as a Scientifically Proven Stormwater Management Tool

Traditionally, urban agriculture has not been considered green infrastructure[23] because its primary purpose is food production. However, urban agriculture can be a means to convert impervious surfaces, like vacant lots, into pervious surfaces which retain stormwater runoff.[24] Vacant lots contain highly compacted soil where approximately 60% of the soil is impervious.[25]

The University of St. Thomas conducted a study in 2016 using runoff coefficients[26] reported in literature. The study compared runoff coefficients for soil types typical for vacant lots with runoff coefficients for soil types typical of urban gardens.[27] The study used the runoff coefficients to quantify the volume of water that would be reduced from runoff in both vacant lots and lots with urban gardens.[28] The study found that urban gardens reduce stormwater runoff better than just vacant lots.[29] Another study by Kevin Levy of the University of Pennsylvania, used the Rational Method[30] to "estimate peak runoff on three land types in Philadelphia: vacant, community garden and developed."[31] Levy determined that "community gardens do in fact have the lowest runoff rate at 18.3 cubic feet per second (cfs), as compared with vacant land at 21.8 cfs or housing development properties at 74-90 cfs, thereby having a beneficial effect on reducing Combined Sewer Overflows."[32]

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[23] Green infrastructure is a "strategy that handles stormwater at its source rather than after it has entered the stormwater system. Maddie Hankard, et al., Stormwater Runoff Benefits of Urban Agriculture, Sustainable Communities Partnership, University of St. Thomas Office of Sustainability Initiatives Center for Global and Local Engagement (2016), https://www.stthomas.edu/media/officeofsustainability/scpsp16projectreports/UrbanAgStormwaterReport.pdf.

[24] *Id.*

[25] Ackerman, K., Plunz, R., Conard, M., Katz, R., Dahlgren, E., & Culligan, P. (2011). The Potential for Urban Agriculture in New York City: Growing Capacity, Food Security and Green Infrastructure. New York: Columbia University Urban Design Lab.

[26] Maddie Hankard, et al., Stormwater Runoff Benefits of Urban Agriculture, Sustainable Communities Partnership, University of St. Thomas Office of Sustainability Initiatives Center for Global and Local Engagement (2016), https://www.stthomas.edu/media/officeofsustainability/scpsp16projectreports/UrbanAgStormwaterReport.pdf. (defining runoff coefficients as "a measurement of the fraction of precipitation that ends up as surface runoff, rather than being absorbed in soils and either ending up as groundwater or being removed through evapotranspiration.").

[27] *Id.*

[28] *Id.*

[29] *Id.* (Example Calculation from study: "An acre of vacant lot (10,890 square feet) has a runoff coefficient of 0.70. This means in a 0.9" rainfall, 0.9"*0.70=0.63" of rain will be runoff. Multiply this by the area of the lot to get 571.72 cubic feet, or 4,277 gallons, of water will be runoff. If this lot is converted to an urban garden, then the new runoff coefficient will be around 0.1 (conservative estimate). So, in a 0.9" rainfall, 0.9*0.1=0.09" of rain will be runoff. Multiply this by area of the lot to get 611 gallons of water that will be runoff. To conclude, converting an acre of a vacant lot to an urban garden will reduce runoff in a 0.9" rainfall event by 85%.").

[30] HydroCAD Stormwater Modeling- Since 1986, https://www.hydrocad.net/rational.htm (The Rational method predicts the peak runoff according to the formula: Q=CiA, where C is a runoff coefficient, i is the rainfall intensity, and A is the sub catchment area.)

[31] Levy, K. (2009). Sustainability in Philadelphia: Community Gardens and their Role in Stormwater Management. Philadelphia: University of Pennsylvania.

[32] *Id.*

A study conducted in Chicago also found that community gardens reduced stormwater runoff better than vacant lots. This study measured the quantity and quality of stormwater runoff from community gardens and rain gardens "using runoff from nearby rooftops as a control, as well as the reduction of municipal water needs by gardens that use rainwater harvesting systems."[33] The study found that "the community garden they studied would reduce annual runoff by 73% compared to a residential development."[34] The study also found that "maintaining a rain water harvesting system would decrease municipal water usage by 25% while retaining stormwater that would otherwise have been runoff."[35]

A study conducted in New York City found that the "presence of community gardens instead of vacant lots can decrease runoff by up to 94,427,364 to 112,956,959 gallons (using the maximum runoff estimates for community gardens)."[36]

Urban agriculture is also cost-effective for cities as farmers who are invested in their plots will maintain the plots in the hopes of growing food for consumption or market. Grass-covered lots can be costly for cities because they require a professional to be hired for frequent mowing and watering. Therefore, urban agriculture not only not only reduces stormwater runoff, but it can reduce the city's expenditure on maintenance of grass-covered lots.[37]

In conclusion, MDE should write a response to this comment that acknowledges that urban agriculture falls under the Impervious Surface Reduction BMP. Urban agriculture is an efficient means of achieving impervious surface reduction, particularly as compared to the labor-intensive street sweeping BMP which Baltimore City heavily relies upon. The available scientific literature indicates that urban agriculture can be a beneficial means of reducing impervious surfaces. The twenty-two member farms of the Farm Alliance of Baltimore are already implementing many of these best management practices. In addition, further study is needed to calculate past and current reduction in stormwater runoff from urban agriculture. MDE should acknowledge in their response that urban agriculture is a beneficial stormwater management practice.

Sincerely,

Mariya Strauss, Executive Director of Farm Alliance of Baltimore

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[33] Meyers, S., Beyer-Clow, L., Daniel G., LoVerde, K., Rodriguez-Ochoa, E., Seaman, T., and Zaplatosch, J. 2014. "Community Based Green Infrastructure Solutions: Changing how we manage stormwater." Openlands.
[34] *Id.*
[35] *Id.*
[36] Maria Gittleman, Estimating Stormwater Runoff for Community Gardens in New York City, City University of New York (CUNY) (May 2015), https://academicworks.cuny.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1004&context=hc_sas_etds.
[37] Knizhnik L. Heather, The Environmental Benefits of Urban Agriculture on Unused, Impermeable and Semi-Permeable Spaces in Major Cities with a Focus on Philadelphia, PA, University of Pennsylvania Department of Earth and Environmental Science (Aug. 2012).

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