MEMORANDUM OF AGREEMENT REGARDING STORMWATER MAINTENANCE

THIS MEMORANDUM OF AGREEMENT REGARDING STORMWATER MAINTENANCE (this "Agreement") made this 2 day of ________, day of ___________, 20 ________, by INDIAN RIVER FARMS OWNERS' ASSOCIATION, a Virginia non-stock corporation ("IRFOA" and, for indexing purposes, "Grantor") and the CITY OF VIRGINIA BEACH, a municipal corporation of the Commonwealth of Virginia, (the "City," and for indexing purposes "Grantee").

WITNESSETH:

WHEREAS, the City is authorized and required to regulate and control the disposition of storm and surface waters within the Stormwater Management District of the City of Virginia Beach as set forth in the City of Virginia Beach Stormwater Management Ordinance, Appendix D, effective July 1, 2014 (the "Ordinance"), adopted pursuant to Sections 62.1-44.15:24, et seq. of the Code of Virginia of 1950, as amended (the "Act") and 9VAC25-870-10 et seq. the Virginia Stormwater Management Regulations.

WHEREAS, IRFOA is the duly constituted property owners association for the neighborhood subdivision known as Indian River Farms ("IRF"), which was formed by the recordation of two subdivision plats, as follows: "Subdivision of Indian River Farms, Section One," recorded in the Clerk's Office in Map Book 299, at pages 31-34; and "Subdivision of Indian River Farms, Section Two recorded in the Clerk's Office in Map Book 300, at pages 79-82 (Plats for Indian River Farms, Sections One and Two, collectively the "Subdivision Plats");

GPINs: See Exhibit A Attached

WHEREAS, IRFOA is the owner of certain real property and easements more particularly described on **Exhibit B** attached hereto (the "IRFOA Real Estate");

WHEREAS, IRFOA also has rights and powers created pursuant to the Declaration of Covenants, Restrictions, Reservations, and Easements of Indian River Farms, dated September 26, 2001, and recorded in the Clerk's Office of the Circuit Court of the City of Virginia Beach (the "Clerk's Office") in Deed Book 4513, at page 249, which was amended by the following documents: "First Amendment to Declaration of Covenants, Restrictions, Reservations of Indian River Farms," recorded in the Clerk's Office in Deed Book 4558, at page 2118; "Amended and Restated First Amendment to Declaration of Covenants, Restrictions, Reservations of Indian River Farms," recorded in the Clerk's Office in Deed Book 4572, at page 315; "Amendment 2015-1 to Declaration of Indian River Farms Owners' Association," recorded in the Clerk's Office as Instrument No. 20151104001081610; "Corrected Amendment 2015-1 to Declaration of Indian River Farms Owners' Association," recorded in the Clerk's Office as Instrument No. 20151228001230900 (the original Declaration, together with all its amendments and restatements of record, collectively the "Declaration");

WHEREAS, the powers and rights the Declaration assigns to IRFOA include a reservation of easements to the Declarant, IRFOA's predecessor, over the "Common Area" as that term is defined in the Declaration, which includes "all ... real property and improvements or facilities now or hereafter owned by [IRFOA] which are intended to be devoted to the common use and enjoyment of the Owners" and includes "open space, private parks, lakes or other water bodies" submitted to the provisions of the Declaration (all IRFOA Real Estate, easements, facilities and other IRFOA rights, hereinafter collectively, the "Property");

WHEREAS, the Subdivision Plats show numbered lots going to the center of the lakes and water bodies in IRF. However, the term "Lot" as defined in the Declaration does not include any portion of the properties designated as "Common Areas" or property dedicated to and accepted by a public authority, and therefore the lakes and other water bodies in IRF are not owned by the individual lot owners, but instead are facilities owned by IRF, within easements or other rights reserved to the IRFOA in the Declaration;

WHEREAS, the City owns certain drainage, impoundment, and maintenance easements shown to be dedicated to the City on the Subdivision Plats, and such additional drainage, impoundment and/or maintenance easements separately conveyed to the City and listed on Exhibit C, attached hereto and made a part hereof (all stormwater related easements referenced as dedicated or to be dedicated to the City by the Subdivision Plat(s) and all easements listed on Exhibit C, collectively the "Public Drainage Easements");

WHEREAS, in addition to conveying, and treating for quality and quantity, runoff from private lands, existing drainage improvements described in the Declaration also convey and treat for quality and quantity runoff from public property, constituting public water;

WHEREAS, Indian River Farms was subdivided and developed before the City began requiring Stormwater Maintenance Agreements for residential subdivisions, and IRFOA has requested clarification of the respective rights and responsibilities as to maintenance of the Facility and System (defined below), which is the purpose for the parties entering into this Agreement;

WHEREAS, the Declaration asserts that IRFOA must maintain storm and surface water management facilities and system (collectively, the "Facility and System") more particularly described and shown on the approved plans for Indian River Farms, the cover sheet for Phase 1 of such plans is attached hereto as **Exhibit E** and made a part hereof, which complete plans and related as-built surveys are on file with the Development Services Center of the Department of

Planning and Community Development of the City of Virginia Beach, Virginia, and are hereby incorporated by reference (collectively, the "Site Plan"); and

WHEREAS, the predecessor in title to IRFOA developed certain phases of the Indian River Farms neighborhood, including construction of three (3) stormwater management ponds also known as "Best Management Practices" facilities (BMPs), designated and depicted in the Subdivision Plats, and designated as "DRAINAGE AND IMPOUNDMENT EASEMENT," and each including a 20' Maintenance Easement surrounding each (collectively, the "Existing BMPs");

WHEREAS, the "Stormwater System," as referenced above, includes all methods and components thereof used to control stormwater, whether quality, quantity or conveyance, including, without limitation, the Existing BMPs and their related conveyance and control structures, whether or not modified in the future;

WHEREAS, the City and IRFOA wish to clarify their respective rights and responsibilities with respect to the Stormwater System;

WHEREAS, the Subdivision Plats include the following notes:

Section One:

"4. THE CITY OF VIRGINIA BEACH IS NOT REQUIRED TO MAINTAIN THE PUBLIC EASEMENTS DEDICATED HERON EXCEPT TO THE EXTENT SAID EASEMENT IS CURRENTLY BEING UTILIZED FOR PUBLIC PURPOSES;" and

"10. DRAINAGE AND IMPOUNDMENT EASEMENT SHALL BE AVAILABLE FOR ALL OF THE FOLLOWING, BUT NOT LIMITED TO CONVEYANCE, COLLECTION, STORAGE, DRAINAGE, IMPOUNDMENT, TREATMENT AND OTHER RELATED USES OF SURFACE AND/OR GROUND WATER. NO ALTERATION WHATSOEVER OF THE LAKE AND ITS BANK SIDE SLOPES WITH THE LIMITS OF THE DRAINAGE AND IMPOUNDMENT EASEMENT IS PERMITTED WITHOUT THE APPROVAL OF THE DEPARTMENT OF PUBLIC WORKS. CITY MAINTENANCE SHALL BE LIMITED TO THAT AS DESCRIBED ABOVE."

Section Two:

"4. THE CITY OF VIRGINIA BEACH IS NOT REQUIRED TO MAINTAIN THE PUBLIC EASEMENTS DEDICATED HERON EXCEPT TO THE EXTENT SAID EASEMENT IS CURRENTLY BEING UTILIZED FOR PUBLIC PURPOSES;" and

"16. DRAINAGE AND IMPOUNDMENT EASEMENT SHALL BE AVAILABLE FOR ALL OF THE FOLLOWING, BUT NOT LIMITED TO CONVEYANCE, COLLECTION, STORAGE, DRAINAGE, IMPOUNDMENT, TREATMENT AND OTHER RELATED USES OF SURFACE AND/OR GROUND WATER. NO ALTERATION WHATSOEVER OF THE LAKE AND ITS BANK SIDE SLOPES WITH THE LIMITS OF THE DRAINAGE AND IMPOUNDMENT EASEMENT IS PERMITTED WITHOUT THE APPROVAL OF THE DEPARTMENT OF PUBLIC WORKS. CITY MAINTENANCE SHALL BE LIMITED TO THAT AS DESCRIBED ABOVE; and

WHEREAS, this Agreement is in settlement of litigation pending in the Circuit Court of the City of Virginia Beach between the parties hereto, entitled: Indian River Farms Owners' Association v. City of Virginia Beach, CL19-4952.

NOW, THEREFORE, in consideration of the mutual premises set forth and the recitals stated above, which are hereby incorporated fully into this Agreement, the receipt and sufficiency of which is hereby acknowledged, the parties hereby agree as follows:

- 1. The Facility and System is owned by IRFOA, except for the following elements, which are owned by the City: structural improvements specifically for conveyance purposes only such as pipes, culverts, inlets, and outfall structures that are located within a public drainage, impoundment or maintenance easement held by the City or on City-owned land and are considered public assets (the "City Facilities").
- 2. IRFOA, its successors and assigns, shall perpetually maintain the Facility and System, except for the City Facilities, in strict accordance with the Site Plan, the Ordinance, the Regulations, the Act and any amendments thereto.
- 3. The maintenance responsibilities of IRFOA include, but are not limited to, the following:
 - Regular removal of trash and debris anywhere within the impoundment area
 (top of bank to top of bank);

- b. Management of all vegetation within the drainage, impoundment and maintenance easement areas, in accordance with the guidance set forth by official state or regional authorities, such as set forth in the pamphlet entitled "HR Storm A guide for Maintaining and Operating BMPs," a copy of which is attached hereto as **Exhibit F** and made a part hereof, which pamphlet was prepared by and/or distributed by the Hampton Roads Planning District Commission.
- c. Management of insects (mosquitos) and any invasive plant or animal species.
- d. Algae control in impounded water (IRFOA is encouraged to contact the City for resources and information regarding available cost-sharing programs).
- e. Promptly notifying the City of any obstructions to the intake or outfall pipes and structures.
- f. All bank stabilization to maintain side slopes to approved design as shown in the Site Plan, except for areas immediately around the intake or outfall pipes and structures owned by the City, which the City will maintain.
- g. Management of species that contribute to erosion (ex., nutria).
- h. Addressing any maintenance needs identified in any inspection report that do not fall within the City's accepted maintenance.
- 4. The City will perform the following maintenance when and if the City deems it necessary or appropriate in its sole and unfettered discretion, or as required by the Commonwealth of Virginia, and subject to appropriated funding:
 - a. Periodic inspections to ensure the BMPs are functioning.

- b. Notify IRFOA of any required remediation resulting from inspection that falls within IRFOA responsibilities set forth herein.
- c. Maintain, repair and replace the in-flow and outfall pipes and structures and perform bank stabilization in the areas immediately surrounding these structures.
- d. Dredging to remove sedimentation, as the City deems necessary its sole discretion. IRFOA may at its own cost perform such dredging sooner, subject to the City's pre-approval of dredging plans.
- At reasonable times and in a reasonable manner as provided in Section 62.1-44.15:39 of the Act and Section 1-29 of the Ordinance, the City, its agents, employees and contractors, shall have the right of ingress and egress over the Property and the right to inspect the Facility and System in order to ensure that the Facility and System is being properly maintained, is continuing to perform in an adequate manner and is in compliance with the Act, the Regulations, the Ordinance and the Site Plan and any amendments.
- 6. This Agreement is intended only to clarify the parties' respective stormwater maintenance responsibilities and nothing in this Agreement shall operate to convey, alter, enlarge, lessen or vacate any of the parties' respective property interests or rights.
- 7. The City's public maintenance easements around the Existing BMPs are nonexclusive and do not prevent IRFOA from exercising its own rights reserved in the Declaration or other land records.
- 8. Should IRFOA or its successors and assigns fail to maintain the Facility and System as required by applicable regulations and laws, within the time specified in a written notice from the City, the City may pursue such remedies as provided by law.

- 9. This Agreement and the covenants and agreements contained herein shall run with the title to the land and whenever the Property shall be held, sold, conveyed or otherwise transferred, it shall be subject to the covenants, stipulations, agreements and provisions of this Agreement, which shall apply to, bind and be obligatory upon IRFOA, its successors and assigns, and shall bind all present and subsequent owners of the Property described herein.
- 10. The provisions of this Agreement shall be severable and if any phrase, clause, sentence or provision is declared unconstitutional, or the applicability thereof to the IRFOA or its successors and assigns is held invalid, the remainder of the Agreement shall not be affected thereby. This Agreement shall be interpreted under the laws of the Commonwealth of Virginia.
- 11. This Agreement shall be recorded in the Clerk's Office of the Circuit Court of the City of Virginia Beach.
- 12. In the event that the City determines, in its sole and unfettered discretion, at any future time that the Facility and System is no longer required, then at the request of the IRFOA, its successors or assigns, the City shall execute a release of this Agreement, which IRFOA shall record in the Clerk's Office, at its expense.
- 13. This Agreement shall be deemed to be a Virginia contract and shall be governed as to all matters whether of validity, interpretations, obligations, performance or otherwise exclusively by the laws of the Commonwealth of Virginia, and all questions arising with respect thereto shall be determined in accordance with such laws. Regardless of where actually delivered and accepted, this Agreement shall be deemed to have been delivered and accepted by all parties in the Commonwealth of Virginia
- 14. Any and all suits for any claims or for any and every breach or dispute arising out of this Agreement shall be maintained in the appropriate court of competent jurisdiction in the City of Virginia Beach.

15.	This Agreement shall not be modified except by written instrument executed by the			
City and IRFOA, or their successors in interest, at the time of modification, and no modification				
shall be effective until recorded in the Clerk's Office.				

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

IN WITNESS WHEREOF, IRFOA has executed this Agreement as of the date first set forth above.

INDIAN RIVER FARMS OWNERS ASSOCIATION,

a Virginia non-stock corporation	,				
BY: (individual, partnership, association, corporation) ATTEST: By: Scaned was Cause for IRFHOA Name Title	ration) Title resident				
ACKNOWLEDGMENT OF OWNER					
STATE OF Virginia CITY OF virginia Beach, to-wit:					
I, Jehha Hop Anger, a Notary Public in and for the City and	d State aforesaid, do				
hereby certify that <u>Diana Merciez</u> , <u>Board Presidence</u> , whose name is signed to the foregoing Instrument, has acknowledged the	ent for Thelian DIN				
City and State aforesaid. He She/They is/are personally known to me or h	as/have produced				
identification.	***********				
GIVEN under my hand this 25th day of July, 20 20.	HOAN ARY A				
Notary Public State of Tapping My Commission 430 31 Notary Registration Number: 7300545	COMMISSION 7300545 ALTH OF VIRO				
Notary Registration Number:	*********				

CITY OF VIRGINIA BEACH, VIRGINIA Signature – City Clerk City Manager/Authorized Designee of City Manager						
CITY'S ACKNOWLEDGEMENT						
STATE OF VIRGINIA CITY OF VIRGINIA BEACH, to wit:						
I, Paige mayraw, a Notary Public in and for the						
City and state aforesaid, do hereby certify that David A. Bradley CITY						
MANAGER/AUTHORIZED DESIGNEE OF THE CITY MANAGER PURSUANT TO §2-154						
OF THE CITY CODE, whose name is signed to the foregoing Agreement, bearing date the 15 to						
day of <u>0 cto bev</u> , 20 20, has acknowledged the same before me in my City and State						
aforesaid. He/She is personally known to me. GIVEN under my hand this 15th day of						
Commonwealth of Virginia Paige T. McGraw - Notary Public Commission No. 7782189 My Commission Expires 1/30/12						
My Commission Expires:						

STATE OF VIRGINIA CITY OF VIRGINIA BEACH, to wit:				
I, Paige mugraw, a Notary Public in and for the				
City and state aforesaid, do hereby certify that Bamus City Clerk				
for the City of Virginia Beach, Virginia, whose name is signed to the foregoing Agreement, bearing				
date the 5th day of 0000, 20 m, has acknowledged the same before me in my City				
and State aforesaid. She is personally known to me.				
GIVEN under my hand this day of Ochow, 2020. Commonwealth of Virginia Paige T. McGraw - Notary Public Commission No. 7782189 My Commission Expires: 1/30/22 Notary Registration Number: 4782189				
APPROVED AS TO CONTENT: Public Works/Operations APPROVED AS TO FORM: City Attorney				

INDIAN RIVER FARMS OWNERS' ASSOCIATION EXHIBIT A – GPINS

1474-70-3966-0000	1474-80-0362-0000	1474 80 7074 0000
1474-70-4875-0000	1474-80-0302-0000	1474-80-7974-0000
1474-70-4910-0000	1474-80-0432-0000	1474-80-8418-0000
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1474-71-5164-0000	1474-80-4409-0000	1474-81-5079-0000
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1474-71-5300-0000	1474-80-4733-0000	1474-81-6133.0000
1474-71-7024-0000	1474-80-5353-0000	1474-81-7117-0000
1474-71-7096-0000	1474-80-5547-0000	1474-81-8088-0000
1474-71-7236-0000	1474-80-5708-0000	1474-81-8106-0000
1474-71-8079-0000	1474-80-6326-0000	1474-90-0610-0000
1474-71-8105-0000	1474-80-6480-0000	1474-90-0685-0000
1474-71-8331-0000	1474-80-6610-0000	1474-90-0940-0000
1474-71-9276-0000	1474-80-6836-0000	1474-90-1649-0000
1474-71-9323-0000	1474-80-7454-0000	1474-90-1940-0000
1474-71-9473-0000	1474-80-7639-0000	1474-90-2725-0000
1474-71-9562-0000	1474-80-7793-0000	1474-90-2823-0000
1474-80-0152-0000	1474-80-7900-0000	2.7.1.20 2023 0000

EXHIBIT "B"

INDIAN RIVER FARMS PROPERTY

GPIN: 1474-71-7456-0000; 3897 Indian River Road

Commencing at a point situate, lying, and being in the City of Virginia Beach, Virginia, on the westerly right-of-way of Indian River Road and at the northeasterly corner of Indian River Farms as shown on the plat entitled "Subdivision of Indian River Farms, Section One," which plat is recorded in Map Book 299, at pages 31-34, in the Clerk's Office of the Circuit Court of the City of Virginia Beach, Virginia; thence following the northerly property line S 61 degrees 40 minutes 03 seconds W, a distance of 38.38' to the point of beginning; thence, following the bounds of the Open Space, S 52 degrees 32 minutes 53 seconds E a distance of 131.30' to a point; thence S 47 degrees 58 minutes 27 seconds E a distance of 147.69' to a point; thence S 52 degrees 32 minutes 53 seconds E a distance of 182.79' to a point; thence S 37 degrees 22 minutes 38 seconds W a distance of 68.29' to a point; thence with a curve turning to the right with an arc length of 125.04', with a radius of 350.00', with a chord bearing of S 47 degrees 36 minutes 43 seconds W, with a chord length of 124.38', thence S 57 degrees 50 minutes 48 seconds W a distance of 86.49' to a point; thence N 32 degrees 09 minutes 12 seconds W a distance of 334.05' to a point; thence N 76 degrees 44 minutes 19 seconds W a distance of 110.00' to a point; thence S 62 degrees 50 minutes 18 seconds W a distance of 127.90' to a point; thence S 14 degrees 29 minutes 28 seconds W a distance of 141.66' to a point; thence S 41 degrees 15 minutes 46 seconds E a distance of 92.43' to a point; thence N 82 degrees 08 minutes 10 seconds W a distance of 92.63' to a point; thence S 62 degrees 50 minutes 44 seconds W a distance of 143.25' to a point; thence S 89 degrees 22 minutes 51 seconds W a distance of 90.12' to a point; thence N 72 degrees 01 minutes 21 seconds W a distance of 48.33' to a point; thence N 84 degrees 03 minutes 23 seconds W a distance of 162.06' to a point; thence S 68 degrees 12 minutes 45 seconds W a distance of 74.15' to a point; thence S 51 degrees 35 minutes 54 seconds W a distance of 66.85' to a point; thence S 17 degrees 49 minutes 26 seconds W a distance of 117.43' to a point; thence S 06 degrees 29 minutes 20 seconds W a distance of 80.76' to a point; thence S 09 degrees 37 minutes 51 seconds E a distance of 100.00' to a point; thence N 75 degrees 39 minutes 58 seconds W a distance of 55.39' to a point; thence N 05 degrees 08 minutes 36 seconds E a distance of 177.39' to a point; thence N 22 degrees 07 minutes 27 seconds W a distance of 52.72' to a point; thence N 36 degrees 21 minutes 39 seconds W a distance of 77.33' to a point; thence N 61 degrees 40 minutes 03 seconds E a distance of 397.71' to a point; thence S 28 degrees 19 minutes 57 seconds E a distance of 20.00' to a point; thence N 61 degrees 40 minutes 03 seconds E a distance of 48.85' to a point; thence with a curve turning to the left with an arc length of 409.93', with a radius of 425.00', with a chord bearing of N 61 degrees 40 minutes 03 seconds E, with a chord length of 394.22', thence N 61 degrees 40 minutes 03 seconds E a distance of 273.35' to a point; which is the point of beginning, having an area 5.164 acres.

IT BEING a portion of the same property conveyed to Virginia Partners, L.P., a Texas limited partnership by deed from Annie Ruth Hale White dated September 29, 2000 and recorded in the aforesaid Clerk's Office on October 6, 2000 in Deed Book 4306, at page 753.

GPIN: 1474-81-9138-0000; 2501 Kentucky Derby Drive

Commencing at a point situate, lying, and being in the City of Virginia Beach, Virginia at a point on the westerly right-of-way of Indian River Farm and at the southeasterly corner of Indian River Farms, as shown on that certain plat entitled "Subdivision of Indian River Farms, Section One," which plat is recorded in the Clerk's Office of the Circuit Court of the City of Virginia Beach, Virginia in Map Book 299 at pages 31-34, thence, following the northerly bounds of Lonnie L. Davis Property, Est. S 51 degrees 24 minutes 49 seconds W a distance of 36.08' to the point of beginning; thence, following the Open Space S 51 degrees 24 minutes 49 seconds W a distance of 153.69' to a point; thence N 19 degrees 55 minutes 15 seconds W a distance of 112.82' to a point; thence N 52 degrees 37 minutes 22 seconds W a distance of 621.84' to a point; thence S 83 degrees 59 minutes 39 seconds W a distance of 99.96' to a point; thence N 32 degrees 09 minutes 12 seconds W a distance of 60.00' to a point; thence N 57 degrees 50 minutes 48 seconds E a distance of 14.21' to a point; thence N 47 degrees 7 minutes 38 seconds W a distance of 179.07' to a point; thence with a curve turning to the left with an arc length of 100.03', with a radius of 400.00', with a chord bearing of N 44 degrees 32 minutes 30 seconds E, with a chord length of 99.77; thence N 37 degrees 22 minutes 38 seconds E a distance of 10.32' to a point; thence S 52 degrees 32 minutes 53 seconds E a distance of 1,043.98' to a point; which is the point of beginning, having an area of 2.426 acres.

IT BEING a portion of the same property conveyed to Virginia Partners, L.P., a Texas limited partnership by deed from Annie Ruth Hale White dated September 29, 2000 and recorded in the aforesaid Clerk's Office on October 6, 2000 in Deed Book 4306, at page 753.

Easements

(1) All easements shown as private on the Subdivision Plats; (2) All unexpired easements reserved by Declarant in the Declaration that have transferred to IRFOA, and (3) all easements held by IRFOA not otherwise identified.

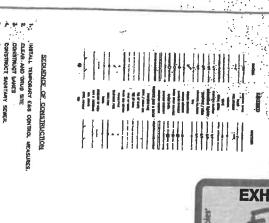
EXHIBIT "C"

CITY EASEMENTS

(not shown on Subdivision Plats)

ALL THOSE certain drainage and access easements granted to the City of Virginia Beach by Deed of Easement Dedication from Indian River Farms, LLC, a Virginia Beach limited liability company, dated November 25, 2003 and recorded in the Clerk's Office of the Circuit Court of the City of Virginia Beach, Virginia as Instrument Number 20040227000329640.

EXHIBIT "D" RESERVED



EXHIBIT

COVER SHEET

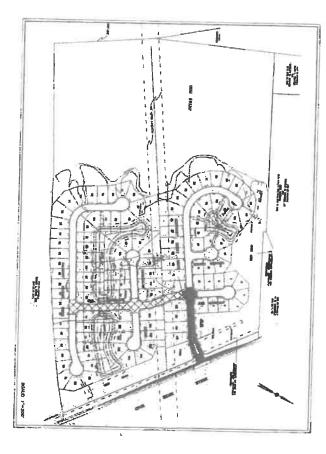
)IAN RIVER FARMS

Auphori Sarina —3" Sis—36 Auphori Sarina (Tee Lifts)
Approprie Subtree —5" Vagregote Bose
Subtree —1" Sisch Lieberte (An. Corege)

-17 Sale-IA Augilett Barbus.
-17 "Approprise Gene".
-17 Salest Material (Ads (18878))

-2" Sil-3/ Appliet Beilge -3" Sil-3 Appliet Beag -7" "Approprie Beag -2" -12" Sideol Holente (No. 0)

* PAVEMENT SECTIONS





SHEET INDEX

COVER SHEET
100 SCALE DEVELOPMENT PLAN
100 SCALE DEVELOPMENT PLAN
MASTER UTILITY, LICHTING, STREET SIGNS
A. STREET TREE PLAN
EROSION CONTROL PLAN
TURN-LANES

OUTFALL STRUCTURE DETAILS PROFILES 40 SCALE DEVELOPMENT PLANS

SUITHERN WATERSHED WETLANDS AND ADJACENT LANDS CUITSDE OF REAR LOS LINES, TO BE GIFTED TO THE CITY OF VIRCINIA BEACH,

AREA OF FLADO, FENAZE-1643863.9 S.F./38,65 AC.
SW OF FLADO, FENAZE-6458A.193 SF./1.633 AC.
TOTAL, AREA OF FLADO, FRINGE 19 EF FILED-9.64 AC.
TOTAL MIRRATION AREA-9.280 AC.

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REV. 5-19/07/00 CHY COMMENTS
REV. 5-19/10/00-CTY COMMENTS
REV. 1-8/08/00- CTY COMMENTS

Dote (8-2-02)

Title Birt an M. Sunt 970

. Date: 12:2:02

WARK/OPEN SPACE TO BE DEDICATED TO CINC LEAGUE

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ASS. ABOR (MITS OF SUITEDIN MATE

SITE DATA

COMSTRUCT STORM OFWHADE
CONSTRUCT WATER PRELINE.
CONSTRUCT STREETS AND SIDEWAYS
COMSTRUCT STREETS AND SIDEWAYS
COMSTRUCT STREETS.

MISCELLANEOUS DETAILS

PAVEMENT MARKING STANDARDS & DETAILS AND LANDSCAPE PLANS SIGN DETAILS



MRGINIA PARTNERS, L.b. MARTINE 1450 POST OAK PLACE, SUITE 340 HOUSTON, TEXAS 77027



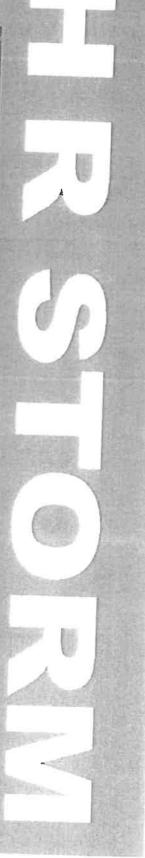
DEVELOPER

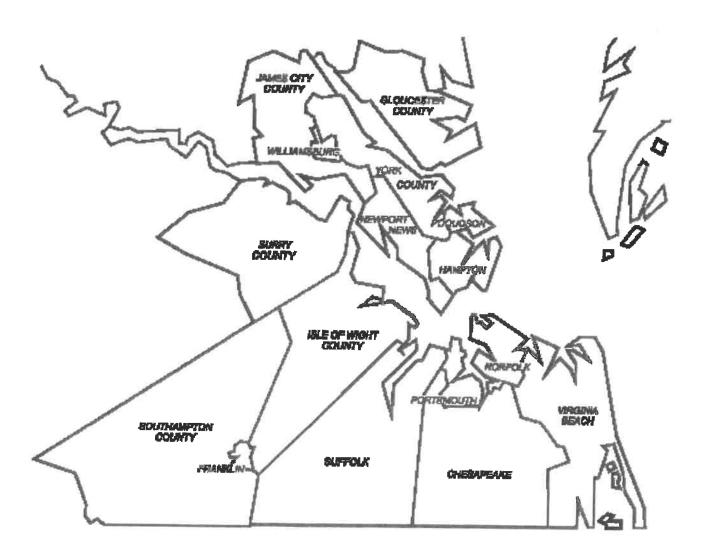
BASGIER AND ASSOCIATES B





A GUIDE FOR MAINTAINING AND OPERATING BMPs





A regional effort to help establish and maintain BMPs throughout Hampton Roads

Why BMPS?1
Types of BMPS
Infiltration Trenches/Basins
Detention Basins/Ponds
Retention Basins/Ponds
Grassed Swales
Filter Strips and Buffers
Elements of BMP Maintenance Program
Overview of BMP Maintenance
Routine Maintenance Needs
Inspections
Vegetation Management
Debris and Litter Removal
Mechanical Component Maintenance
Pest Control
Non-Routine Maintenance Needs
Pond Maintenance
Bank Stabilization
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Talk the Talk

Here is a glossary to help guide you through the maze of acronyms and technical jargon.

Access Systems:
Measures and devices that provide access to facility components by maintenance personnel and

Aeration:

The process to increase oxygen levels in the water by circulating the water in a lake or pond.

Algae:

A small plant that grows naturally in most rivers, lakes, and bays. Nutrients like phosphorus and nitrogen can make algae grow faster.

Anti-vortex Device:
A device that
promotes the settling
of pollutants by
preventing a whirlpool
from occurring at the
outlet device.

A Guide to Maintaining BMPs

Best Management Practices (BMPs), are devices used to reduce pollution in stormwater runoff, thereby protecting area waterways. These practices are often permanent facilities designed to handle stormwater runoff for a specific area. As a property owner or Homeowners Association, you may be responsible for maintenance of a BMP.

Why BMPs?

In recent years, the impacts on area waterways, due to the urbanization of watersheds, have become evident. With continued construction of paved surfaces and development projects, the drainage patterns become altered, which often results in flooding. Normal day-to-day activities such as washing the car and fertilizing the lawn, have also contributed to water pollution. Excess fertilizer, lawn chemicals, automotive products, pet waste, leaves, debris, litter and anything else that washes from the landscape are carried with each rain storm into drainage systems, some of which flow directly into area waterways. BMPs reduce the flow which allows for filtration of pollutants before the stormwater enters our streams, rivers, lakes and bays. To ensure that BMPs perform as expected, they must be maintained properly. No two BMPs are alike, and their maintenance needs may differ.

Types of BMPs In Hampton Roads

Infiltration Trenches/Basins are stone-filled excavations that temporarily store stormwater runoff and allow it to soak into the soil beneath it. There are two basic types of infiltration facilities, distinguished by how stormwater enters the facility.

Dispersed input facilities allow stormwater to enter the top of the trench or basin as overland runoff.

Concentrated input facilities receive stormwater from curb inlets, gutters and pipes.



A well-maintained detention or dry pond.

Detention Basins/Ponds (also known as dry ponds) are manmade basins, which detain water for specified periods of time after a storm. Dry ponds do not contain a permanent pool of water and are normally dry during non-rainfall periods. Water is impounded temporarily to allow much of the sediment carried by the runoff to settle to the bottom. Many of the pollutants, such as nutrients, are attached to sediment particles and are also removed. The impounded water is discharged via an outlet. No standing water should remain if the facility is functioning properly.



A well-kept retention pond with rip rap.

Retention
Basins/Ponds (also known as wet ponds or stormwater ponds) have a permanent pool of water. Retention ponds are more effective at improving water quality than dry ponds because they

alllow more time for pollutant settling and removal. Since there are only two natural lakes in Virginia, it is likely the lake in your neighborhood is actually a stormwater retention pond.



If you have a grassed swale like this in your yard, you have a BMP.

Grassed Swales are gently sloped areas of vegetation that slow the flow of runoff, channeling it to other BMPs. Grassed swales are typically found in residential developments as an alternative to curb and gutter. Swale maintenance is typically the responsibility of the homeowner and includes mowing and periodic reseeding. Mowing the grass too short or improperly applying lawn chemicals can negatively impact the performance of the BMP.

Aquascaping:

Landscaping the shoreline of ponds and lakes with aquatic and wetland vegetation.

Berm:

A ridge of material, typically soil, which is used to retain or redirect stornwater flow.

Bioaugmentation:
Adding naturally
occurring bacteria to a
pond or lake to reduce
nutrient levels,
typically used to
reduce algae blooms.

BMP:

Best Management
Practice; devices used
to reduce pollution in
stormwater runoff.

Bypass System:
A system which allow maintenance by temporarily diverting stormwater.

Dam/Embankment
The structure that
impounds runoff into
a stormwater facility.

Detention
Basin/Pond:
A BMP which provides temporary storage of stormwater runoff.
Also known as a dry pond.

Emergency
Outlet/Spillway:
A structure that safely
conveys stormwater
overflow from a BMP
pond.

Emergent Plants:
An aquatic plant that is rooted in sediment but has leaves at or above the water.

Environmentally
Friendly
Landscaping:
Landscaping that
requires minimal
chemicals and
improves water
absorption.

Filter Fabric/
Geomembrane:
A webbed fabric
which serves to filter
pollutants or to hold a
filter medium, such as
sand or gravel, in
place.

Filter Strips and Buffers are areas of vegetation that remove pollutants in runoff as the water flows through it. Filter strips are similar to grass swales, only wider. Buffer areas can contain a variety of vegetation, including trees and shrubs.

Elements of a Maintenance Program

Overview of BMP Maintenance

BMPs will not perform as designed if they are not regularly maintained. If a facility's storage capacity is reduced, some downstream flooding will indicate the problem; however, if a facility is not removing sediment and nutrients as originally designed, there may not be any obvious indicators of the problem. A regular maintenance program is the best way to ensure that a BMP will consistently perform its water quality improvement functions.

It is important to note that while general maintenance tasks can be outlined, actual maintenance needs will vary according to specific site conditions, particularly the following elements:

Landscaping: Certain vegetation may require more attention. Consider using native plants to reduce maintenance needs. Upstream Conditions: Watershed conditions upstream of the facility will affect the amount of sediment and pollutants that must be managed.

Safety: Some tasks can be effectively handled by residents; however, a maintenance program should ensure the safety of anyone carrying out tasks, and often a professional should be hired to do the work.

Technical Expertise: BMPs are stormwater treatment facilities. While many maintenance needs like litter and debris removal are obvious, some problems may not be detectable to the untrained eye.

Financing: A fund should be established to provide for the costs of long-term maintenance needs.

Routine Maintenance Needs

Inspections

Local regulations do not require a particular schedule of inspections. Annual inspection by a qualified professional is recommended to ensure that the facility is functioning properly.

Your local Department of Public Works or Department of Engineering (see Resources on pg. 13) can answer questions about what to check for. At a minimum, an inspector should check for the following.

Vegetation Management

Vegetative cover serves several purposes in BMPs: slows the velocity of the runoff; filters sediment from runoff as it is collected in the BMP; and prevents erosion of the banks and bottom of the facility.

Grass is generally used around retention basins, infiltration trenches and in and around dry detention basins. It must be mowed and maintained. Mowing requirements can be tailored to the specific needs of a site and the neighboring



Plants along the edges of BMPs filter pollutants.

properties. The grass in a BMP may be hardiest if maintained as an upland meadow, cutting no shorter than 6-8 inches. Maintaining a more manicured expanse of grass decreases the effectiveness of the BMP, as well as increasing its maintenance costs. Wetland plants may also be used along the fringe of the BMP in areas where conditions are favorable. Some of these types of plants may inhabit the area naturally. The vegetation sur-

The vegetation surrounding infiltration trenches or buffer strips also removes some

Fountain:

A decorative water feature that does not improve water quality because it uses a low volume of water at high pressure (not an aerator).

Impervious Cover:
Any hard surface that prevents water from soaking into the soil

Infiltration Trench:
Stone filled
excavations that
temporarily store
stromwater runoff and
allow it to soak into
the soil.

Inlet:

The pipe that carries stormwater into the BMP.

Nonpoint Source

Pollution:
A type of pollution that doesn't come from a single identifiable source, or point, such as a sewage treatment plant or an industrial discharge pipe. It is generated in day-to-day activities.

Nutrients:

Substances which hel plants and animals live and grow. Excess amounts of two nutrients, nitrogen and phosphorus, can cause algae blooms and fish kills.

Outfall:

A pipe that discharges stormwater directly into a stream, river, or waterway.

Principle Outlet:
The main structure that controls and conveys a facility's

Pump System:
Electrical and
mechanical
components including
pipework used to
convey BMP
discharge.

Retention Basin/Pond:

A BMP which provides permanent storage of stormwater runoff. Also know as a wet pond. sediment before the stormwater enters the BMP. If plants are damaged or become laden with sediment, they can no longer perform beneficially. Therefore, the condition of these areas should be closely monitored, and vegetation replaced if necessary.

Debris and Litter Removal

Regular removal of debris and litter is efficient and effective, having several benefits:

- Reduces the chance of clogging in outlet structures, trash racks and other components.
- Prevents possible damage to vegetated areas.
- Reduces potential mosquito breeding habitats.
- Maintains facility appearance.
- Reduces conditions for excessive surface algae.



Remove debris to improve BMP function and aesthetics.

Mechanical Component Maintenance

Each type of BMP may have mechanical components that need periodic attention to ensure their continued performance. Valves, gates, pumps, fences, locks and access hatches should be maintained at all times. Design and site factors will determine the amount of maintenance that is necessary.

Pest Control

Mosquito and other insect breeding grounds can be created by standing water. The most effective control technique in retention basins is to prevent stagnant areas. Prompt removal of floating debris helps. In larger basins, it may also be possible to maintain stocks of fish that feed upon mosquito larvae. The wave action created by surface aerators increases oxygen levels and also discourages mosquito breeding.

Animal burrows will also deteriorate the structural integrity of an embankment. Muskrats and nutria, in particular, will burrow tunnels up to six inches in diameter. Existing burrows should be filled as soon as possible.

Non-Routine Maintenance Needs

Pond Maintenance

To ensure peak performance of retention basins, a healthy aquatic environment should exist. A healthy aquatic ecosystem typically requires little maintenance. Excess nutrients are a



An algae bloom is an indicator of excessive nutrients.

common problem with retention ponds. An indicator of excess nutrients is excessive algae growth in the permanent pool of a retention basin. In most cases, growth of more desirable aquatic and semi-aquatic vegetation in and around the permanent pool will help to utilize nutrients in the pond, thus deterring the growth of algae and other nuisance vegetation.

Bank Stabilization

It is very important to prevent erosion of the banks and bottom of detention basins (dry ponds) and the visible banks of retention ponds. The easiest way to do this is to keep groundcover healthy. Areas of bare soil will erode quickly, clogging the basin with soil and threatening its integrity. Any bare areas should be re-seeded and stabilized as quickly as possible.

The roots of woody growth, such as young trees and shrubs, can also destabilize embankments. Consistent maintenance can control any stray seedlings that take root in an embankment. Woody growth away from the embankment does not generally pose a threat to the stability of the

Rip Rap:

Large stones engineered and placed to prevent erosion.

Riser: A vertical pipe extending from the bottom of a BMP that is used to control the rate of stormwater discharge.

Runoff Pollution:

The pollution caused when water washes chemicals and other pollutants off of farm fields, yards, and roads and carries them to streams and waterways.

Sediments: Soil particles carried by rainwater into streams, lakes, rivers and bays.

Stormwater:
Rainwater that runs
off over land

Swale: gently sloped area of vegetation used to slow the flow of runoff, channeling it to other BMPs.

Vegetative Buffer:
Areas of vegetation that remove pollutants in runoff as the water flows through it (also known as filter strips and buffers).

Watershed: An area of land that slopes or drains toward or into a lake, river, stream, or wetland. This is also known as a drainage basin.

embankment and can play an important role in the health of the vegetative environment. For ease of maintenance, trees and shrubs should be planted outside maintenance and access areas.



Healthy ground cover prevents erosion.

Sediment Removal

Sediment removal, or dredging, may be a maintenance option for you to consider. Dredging removes the layer of highly enriched materials from the lake's bottom. Removing this nutrient "bank" prevents phosphorus from releasing back into the water column and consequently being discharged into receiving waters during the next storm. This also helps lower nutrient concentrations in the lake, thus decreasing nuisance algae blooms. Dredging can help to improve water quality by deepening the BMP, providing additional storage capacity. But, deeper is not always better! Consult a professional for optimum BMP depth.

Sediment Removal in Retention and Detention Basins

Sediment will accumulate in a BMP and will eventually need to be removed, but facilities vary so much that there are no hard and fast rules about when and how. For



Dredging helps lower nutrient concentrations in water.

planning purposes, sediment removal should be considered on the following intervals:

- Extended detention basins (dry ponds): every 2-10 years
- Retention basins (wet ponds): every 5 –15 years Sediment removal is usually the largest single cost of BMP maintenance; therefore, it is best to plan ahead to allow for contractual negotiations, as well as adequate funding.



BMPs reduce pollution and flooding by containing stormwater.

The sediment removed from your basin will require proper disposal.

Typically, an onsite area or a site adjacent to the facility (but outside the floodplain) is set aside for the spoil. If such a disposal area is not set aside,

transportation and landfill tipping fees can greatly increase the cost of sediment removal. Once the sediment is removed, the bottom of the basin and any disturbed areas need to be stabilized and revegetated or the facility will quickly clog and require sediment removal again.

Wet sediment is more difficult and expensive to remove than dry sediment. In some cases the entire basin can be drained and allowed to dry so that equipment can remove sediment from the bottom. In other cases, where this is not practical, it may be necessary to remove sediment from a vantagepoint on the shoreline or by hydraulic dredging from the surface. This additional cost of sediment removal for a retention facility is partially offset by the longer interval between dredging cycles. Disposal of wet sediment is not allowed in many landfills, so the material often must be dried (dewatered) prior to disposal. This extra step adds to the cost and requires a place where wet material can be temporarily placed to dry.

In general, maintenance programs will contain the following components:

Routine:

- Regular inspections
- Vegetation management
- Debris and litter control
- •Mechanical components maintenance

Non-Routine:

- ·Bank stabilization
- · Sediment removal
- Outlet structure maintenance and replacement



A properly functioning retention pond.

Sediment Removal in Infiltration Trenches

Infiltration facilities tend to clog more frequently than either detention or retention basins. Therefore, it is recommended that these facilities be inspected at least two to four times a year. Most infiltration trenches have a sediment trap or filter to remove some sediment before the stormwater enters the trench. Keeping this sediment filter clean is vital to ensuring the long-term performance of the infiltration trench.

This is especially critical for concentrated input facilities that use sediment traps. If the sediment trap is full, sediment-laden water will be conveyed into the trench. With dispersed input facilities, a clogged sediment barrier is indicated when water cannot flow into the trench and goes through the overflow channel. For any overflow condition, the observation well should be checked to determine the cause. If the trench remains filled with water after a rain event and causes regular overflow, then the aggregate stone should be excavated and the facility rebuilt.

The specific sediment removal procedure will depend on the manner in which the stormwater enters the facility. Concentrated input facilities will have some kind of in-line filter system or sediment trap. Clean-out procedures should be described in approved facility plans, as well as in any maintenance agreement. If there is any question on how routine sediment removal is to be performed for a given facility, the designing engineer or your local Public Works or Engineering Departments can make recommendations.

For typical trenches using dispersed input, routine sediment removal usually means removing the top 6 to 12 inches of filter gravel and replacing the filter cloth sediment barrier that covers the aggregate reservoir. A layer of clean filter gravel replaces the gravel removed. Any bare spots or damaged areas in the grass filter strip should be replaced with sod upon completion of the sediment removal procedure.

Who Should Carry Out the Maintenance?

Before tackling any maintenance project, the first step is to contact your local Department of Public Works or Department of Engineering. When designing a maintenance program, safety, cost and effectiveness of the maintenance activities need to be balanced. Some activities, like mowing and litter removal, can be less expensive if done in-house.

It is usually worthwhile to hire professionals to detect problems early, when they are most cost effective to fix. This might include filling eroded areas, soil disturbing activities, grading, and sediment removal. If not performed properly, efforts may be wasted, and cause damage to the facility by excessive erosion. Be sure to contract with a reputable firm and ask for references and sites that you can check.

Other Things You Can Do Aquascaping

Aquascaping is simply landscaping the shoreline of ponds and lakes with aquatic and wetland plants. Ponds and lakes with a landscape design have fewer problems than those without. Vegetation filters polluted runoff and traps sediments. Aquatic plants pump oxygen into the water and create habitats by providing cover and nurseries for fish and other organisms. More importantly, vegetated shorelines help improve water quality. Vegetated stormwater



Plants absorb runoff water.

Minimum Inspection Checklist

- Excessive erosion or sedimentation
- Obstruction of the inlet or outlet devices by trash or debris
- Cracking or settling of the dam
- Low spots in the bottom of an extended detention facility
- Deterioration of pipes
- •Condition of the emergency spillway
- •Stability of the side-slopes, up and downstream channel conditions
- Signs of vandalism

lakes have a pollutant removal capacity that can be up to five times higher than unvegetated lakes. With proper planning and planting, stormwater BMPs can thrive like natural lakes, prolonging their lifespan and enhancing their ability to improve water quality.

Aeration

Aeration is a costeffective method of enhancing water quality and provides an environmentally friendly alternative to chemical use. Aeration stimulates natural



Aerators can be functional and decorative, unlike fountains which are only decorative.

processes that improve water quality. Aeration also keeps dissolved oxygen levels high, which can help prevent fish kills in the summer. By raising oxygen levels, aeration also stimulates aerobic bacteria, which are important for stormwater BMPs, as they digest excess nutrients.

Aeration is a science, so when considering an aeration system for your pond or lake, consult an expert. Look for companies that specialize in lake management and aeration.

Remember that fountains are NOT aerators. A fountain is a decorative water feature that does not improve water quality. Fountains have no impact on water quality because they use a low volume of water at high pressure. Aerators use a high volume of water at low pressure to circulate water throughout the lake, rather than simply spraying the water into the air.

Chemicals

Chemical treatments require a professional with the appropriate licensing. A mistake in dosage can be toxic to fish and can have serious impacts downstream. Oxygen depletion and fish kills are distinct hazards when treating large infestations of nuisance vegetation. Furthermore, chemical control is usually temporary and, at best, merely treats the symptoms.

Maintenance efforts that emphasize chemical treatments year after year are expensive and can perpetuate nuisance algae and vegetation problems.

Bioaugmentation

Bioaugmentation involves the addition of a special blend of naturally occurring bacteria to the pond or lake. These bacteria compete with algae for nutrients, digest dead organic matter throughout the water column and sludge layer, and eliminate pond odor caused by ammonia and hydrogen sulfide. Bioaugmentation products are sold under brand names such as LakePak and OtterClear. If considering bioaugmentation, consult a professional. The effectiveness of any bioaugmentation product is greatly enhanced with the use of an aeration system.





State

Department of Conservation and Recreation 1548 Holland Road Suffolk, VA 23434 757-925-2468 www.state.va.us/~dcr

Department of Environmental Quality Tidewater Regional Office 5636 Southern Boulevard Virginia Beach, VA 23462 757-518-2000 www.deq.state.va.us

Regional

Hampton Roads Planning District Commission 723 Woodlake Drive Chesapeake, VA 23320 757-420-8300 www.hrpdc.org

Virginia Cooperative Extension Diamond Springs Research Station 1444 Diamond Springs Road Virginia Beach, VA 23455 757-363-3900 www.ext.vt.edu

Local

Chesapeake

Deptartment of Public Works Stormwater Management 757–382-3333 www.chesapeake.va.us

Franklin

Deptartment of Public Works and Utilities 757-562-8565

Gloucester County

Office of Community Development Department of Public Works 804-693-4040 www.co.gloucester.va.us

Hampton

Deptartment of Public Works Engineering 757-727-6388 www.hampton.va.us

Isle of Wight County

Deptartment of Planning and Zoning 757-357-3191

James City County

Environmental Division 757-253-6670 www.james-city.va.us

Newport News

Department of Engineering Stormwater Management 757-926-8611 www.newport-news.va.us

Norfolk

Deptartment of Public Works Stormwater Management 757-441-2408 www.norfolk.va.us

Poquoson

Deptartment of Engineering and Utilities 757-868-3025 www.ci.poquoson.va.us

Portsmouth

Department of Engineering & Technical Services 757-393-8592 www.portsmouth.va.us

Southampton County

Department of Utilities 757-653-3015

Suffolk

Department of Public Works Engineering 757-934-3111 www.suffolk.va.us

Surry County

Department of Planning 757-294-5210

Virginia Beach

Deptartment of Public Works Engineering Division 757-427-4131 www.virginia-beach.va.us

Williamsburg

Deptartment of Public Works and Utilities 757-220-6140 www.ci.williamsburg.va.us

York County

Department of Environmental & Development Services 757-890-3752 www.co.york.va.us

For further information, visit our website: www.hrstorm.org

Inspection Log

Observations:		
Date: Observations:	Inspected by: _	
Date: Observations:	Inspected by: _	
Date: Observations:	Inspected by: _	
Date: Observations:	Inspected by:	
Date: Observations:	Inspected by:	
Date: Dbservations:	Inspected by:	

BMP Inspection Checklist Routine self inspection of your BMP is the best way to catch potential problems before they become a liability. The following is a guide to get you started. Answering YES to any of these questions indicates a need for corrective action or consultation with a professional inspector. We encourage you to copy this checklist and maintain a record of your inspections. Yes No Does the facility show signs of settling, cracking, bulging, misalignment or other structural deterioration? Do the embankments, emergency spillways, side slopes or inlet/outlet structures show signs of erosion? Is the outlet pipe damaged or not functioning properly? Do the impoundment and inlet areas show erosion, low spots or lack of stabilization? Is woody vegetation that may interfere with the facility's performance present on the banks? Is there evidence of animal burrows? Are contributing areas unstabilized with evidence of erosion? Do vegetated areas need mowing or is there a build up of clippings that could clog the facility? Does the depth of sediment pose a threat to storage volume? Is there standing water in appropriate areas? In inappropriate areas? Is there accumulation of trash or debris? ls there evidence of encroachment or improper use of the impounded areas? Are there signs of vandalism?

Do any safety devices such as fences, gates or locks

Is there excessive algae or dominance of one type

Is there evidence of automotive fluids entering or

need repair?

of vegetation?

clogging the facility?

Is there evidence of a fish kill?





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