



October 30, 2019

Maryland Department of the Environment, Water and Science Administration Sediment, Stormwater, and Dam Safety Program
1800 Washington Boulevard, Suite 440, Baltimore, MD 21230-1708
Phone: 410-537-3543 FAX: 410-537-3553
Web Site: www.mde.maryland.gov

RE: NPDES/MS4 - Year 1 Progress Report for the Universities at Shady Grove

To whom it may concern:

This submission package contains the Year One Annual Reporting documents, in accordance with the NPDES/MS4 General Permit requirements for the Universities at Shady Grove. This package also contains supplemental documents (Appendices A, B and C), which are referenced in Section I of the submission.

In September 2018, The Universities at Shady Grove commissioned Maryland Environmental Service (MES) to perform a full assessment of the storm drain and stormwater infrastructure on USG's campus. The information contained in their June 2019 final report serves as the basis of this "Year One Progress report" document.

It should be noted that USG (a USM institute) and IBBR (a University of Maryland at College Park institute) share the campus jointly; however, there are separate NOI's for USG and IBBR. This Year One progress report only covers the 34 acres that are managed by USG.

Feel free to contact me if there are any questions regarding this submission package.

Thank You,

Paul Jackson Jr.
Planning Manager
The Universities at Shady Grove



The Universities AT SHADY GROVE



— Management Boundary 34 Acres

■ USG Buildings
■ IBBR

■ Parking Lot
■ Roads

■ Waterbody
■ Wooded Area

Maryland Department of the Environment (MDE)

**National Pollutant Discharge Elimination System (NPDES)
Small Municipal Separate Storm Sewer Systems (MS4) General Permit**

This Progress Report is required for those State and federal agencies covered under General Discharge Permit No. 13-SF-5501. Progress Reports must be submitted to:

Maryland Department of the Environment, Water and Science Administration
Sediment, Stormwater, and Dam Safety Program
1800 Washington Boulevard, Suite 440, Baltimore, MD 21230-1708
Phone: 410-537-3543 FAX: 410-537-3553
Web Site: www.mde.maryland.gov

Contact Information

Permittee Name:	Universities at Shady Grove, Univ System of MD
Responsible Personnel:	Ellen Herbst, USM Vice Chancellor for Adm & Fin
Mailing Address:	3300 Metzert Road Adelphi, MD 20783-1690
Phone Number(s):	301-445-1923
Email address:	eherbst@usm.edu
Additional Contact(s):	Jane Briggs, USG Dir of Facilities & Services
Mailing Address:	9630 Gudelsky Dr., Rockville MD 20850
Phone Number(s):	(301) 738-6111
Email address:	Jbriggs1@umd.edu

Signature of Responsible Personnel

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Printed Name

Signature

Date

Reporting Period (State Fiscal Year):

2019

Due Date:

10/31/2019

Date of Submission:

10/30/2019

Type of Report Submitted:

Impervious Area Restoration Progress Report (Annual):

Six Minimum Control Measures Progress (Years 2 and 4):

Both:

Permittee Information:

Renewal Permittee:

New Permittee:

Compliance with Reporting Requirements

Part VI of the Small MS4 General Discharge Permit (No. 13-SF-5501) specifies the reporting information that must be submitted to MDE to demonstrate compliance with permit conditions. The specific information required in this MS4 Progress Report includes:

1. **Annual:** Progress toward compliance with impervious area restoration requirements in accordance with Part V of the general permit. All requested information and supporting documentation must be submitted as specified in Section I of the Progress Report.
2. Years 2 and 4: Progress toward compliance with the six minimum control measures in accordance with Part IV of the general permit. All requested information and supporting documentation shall be reported as specified in Section II of the Progress Report. MDE may request more frequent reporting and/or a final report in year 5 if additional information is needed to demonstrate compliance with the permit.

Instructions for Completing Appendix D Reporting Forms

The reporting forms provided in Appendix D allow the user to electronically fill in answers to questions. Users may enter quantifiable information (e.g., number of outfalls inspected) in text boxes. When a more descriptive explanation is requested, the reporting forms will expand as the user types to allow as much information needed to fully answer the question. The permittee must indicate in the forms when attachments are included to provide sufficient information required in the MS4 Progress Report.

Section I: Impervious Area Restoration Reporting

1. a. Was the impervious area baseline assessment submitted in year 1?

Yes No

As this is USG's 1st year reporting period, the baseline assessment is being submitted with this report. See attached documents found in "Appendix A".

b. If No, describe the status of completing the required information and provide a date at which all information required by MDE will be submitted:

c. Has the baseline been adjusted since the previous reporting year?

Yes No **This is USG's 1st Year Reporting**

2. Complete the information below based on the most recent data:

Total impervious acres of area covered under this permit:

Total impervious acres treated by stormwater water quality best management practices (BMPs):

Total impervious acres treated by BMPs providing partial water quality treatment (multiply acres treated by percent of water quality provided):

Total impervious acres treated by nonstructural practices (i.e., rooftop disconnections, non-rooftop disconnections, or vegetated swales):

Total impervious acres untreated:

Twenty percent of this total area (this is the restoration requirement):

Verify that all impervious area draining to BMPs with missing inspection records is not considered treated. Describe how this information was incorporated into the overall analysis: **There are no missing inspection records.**

3. Has an Impervious Area Restoration Work Plan been developed and submitted to MDE in accordance with Part V.B, Table 1 of the permit or other format?

Yes No

Has MDE approved the work plan?

Yes No

If the answer to either question is No, describe the status of submitting (or resubmitting) the work plan to MDE and provide a date at which all outstanding information will be available:

Section I: Impervious Area Restoration Reporting

USG commissioned Maryland Environmental Service (MES) to perform a full assessment of the storm drain and stormwater infrastructure on USG's campus. Part of the commissioned report showed the amount of stormwater treatment on USG's campus meets MDE's requirements, thus, the 20% restoration requirement is not applicable to USG. However, several inspected BMP's were found to be substandard and are in need of repair. Please review the attached pages found in "**Appendix B**" from MES' Stormwater Treatment Report, which support this position. USG has included in this submission a Restoration Work Plan for these failing BMP's.

Describe progress made toward restoration planning, design, and construction efforts and describe adaptive management strategies necessary to meet restoration requirements by the end of the permit term: **See the response above.**

4. Has a Restoration Schedule been completed and submitted to MDE in accordance with Part V.B, Table 2 of the permit?

Yes No **A Restoration Work Plan is being submitted for failing BMP's; see "Appendix C".**

In year 5, has a complete restoration schedule been submitted including a complete list of projects and implementation dates for all BMPs needed to meet the twenty percent restoration requirement?

Yes No **N/A**

Are the projected implementation years for completion of all BMPs no later than 2025?

Yes No

Describe actions planned to provide a complete list of projects in order to achieve compliance by the end of the permit term: **See "Appendix C" – Maintenance & Remediation recommendation for individual BMP repairs.**

Describe the progress of restoration efforts (attach examples and photos of proposed or completed projects when available): **Identification of failed BMP's and scope of work has been developed. Funding still to be identified prior to scheduling.**

5. Has the BMP database been submitted to MDE in Microsoft Excel format in accordance with Appendix B, Tables B.1.a, b, and c?

Yes No **The BMP database is being included as part of this Year 1 Annual report. See "Appendix A".**

Is the database complete?

Yes No

If either answer is No, describe efforts underway to complete all data fields, and a date that MDE will receive the required information:

Section I: Impervious Area Restoration Reporting

6. Provide a summary of impervious area restoration activities planned for the next reporting cycle (attach additional information if necessary): **Funding to restore failed BMP's to be identified.**

7. Describe coordination efforts with other agencies regarding the implementation of impervious area restoration activities: **As IBBR (an institute of The University of Maryland at College Park) shares a portion of USG's campus; USG is coordinating campus restoration activities with IBBR. One of the activities includes restoring two infiltration trenches, closest to the IBBR buildings, which are failing.**

8. List the total cost of developing and implementing impervious area restoration program during the permit term: **MES cited seven BMP's as being substandard and in need of repair. Five of those seven BMP's are USG's responsibility. The total cost needed to bring the BMP's up to standard is estimated at \$400k.**

Appendix A

Baseline Assessment Documents (BMP Database)

APPENDIX A: BMP DATABASE BASELINE DOCUMENTS. TABLE B.1.a

This table represents the basic data elements that are required of all structural, ESD and alternative Best Management Practices (BMPs)

Table B.1.a. BMP Reporting Requirements

BMP_ID ¹	REPORTING_YEAR	MD_NORTH ²	MD_EAST	PERMIT_NUM	LOCAL_BMP_ID	BMP_NAME	BMP_CLASS	BMP_TYPE	CON_PURPOSE	LAST_INSP_DATE	BMP_STATUS	GEN_COMMENTS
USG19BMP00001	2019	520316.8963	1255288.972	13-SF_5501	BMP00001	Travilla Gateway Garage Baysaver	S	XOGS	REDE			BaySaver, Pretreatment Credit Only
USG19BMP00002	2019	520037.7446	1255457.413	13-SF_5501	BMP00002	Building 2 Sand Filter	S	FSND	NEWD	2019-01-11	F	
USG19BMP00003	2019	520033.0301	1255616.148	13-SF_5501	BMP00003	Infiltration Trench 1 at IBBR	S	ITRN	NEWD	2019-01-11	F	42'Lx3'Wx5'D
USG19BMP00004	2019	519868.596	1255857.732	13-SF_5501	BMP00004	IBBR Outfall Stabilization	A	OUT	NEWD			
USG19BMP00005	2019	519741.6238	1255626.521	13-SF_5501	BMP00005	Infiltration Trench 2 at IBBR	S	ITRN	NEWD	2019-01-11	P	12'Lx9.5'Wx5'D
USG19BMP00006	2019	519618.023	1255609.847	13-SF_5501	BMP00006	Infiltration Trench 3 at IBBR	S	ITRN	NEWD	2019-01-11	F	27'Lx24'Wx5'D
USG19BMP00007	2019	519478.7621	1255649.23	13-SF_5501	BMP00007	IBBR Pond	S	PWET	NEWD	2019-01-11	P	No Design Plans
USG19BMP00008	2019	519887.2161	1254977.072	13-SF_5501	BMP00008	Green Roof at Building 3	E	AGRE	REDE			No Design Plans BaySaver, Pretreatment Credit Only - Plans had 0.11 more DA called out.
USG19BMP00009	2019	519689.8575	1255013.802	13-SF_5501	BMP00009	Building 3 Baysaver	S	XOGS	REDE			
USG19BMP00010	2019	519292.8426	1255325.226	13-SF_5501	BMP00010	BSE ESD-8	E	MMBR	REDE			Facility is not currently active due to construction
USG19BMP00012	2019	519564.5543	1256290.532	13-SF_5501	BMP00012	Micro-Bioretention 4 at Shady Grove Garage	E	MMBR	NEWD	2019-01-08	P	Filter media depth determined from overflow inlet inverts
USG19BMP00013	2019	519536.4198	1256338.858	13-SF_5501	BMP00013	Micro-Bioretention 5 at Shady Grove Garage	E	MMBR	NEWD	2019-01-11	P	Treatment filter depth assumed from Typical MDE Designs STD
USG19BMP00014	2019	519372.1675	1256237.235	13-SF_5501	BMP00014	Micro-Bioretention 3 at Shady Grove Garage	E	MMBR	NEWD	2019-01-11	P	Treatment filter depth assumed from Typical MDE Designs STD
USG19BMP00015	2019	519205.951	1256111.254	13-SF_5501	BMP00015	Micro-Bioretention 2 at Shady Grove Garage	E	MMBR	NEWD	2019-01-15	P	Filter media depth determined from overflow inlet inverts
USG19BMP00017	2019	519142.0391	1256213.508	13-SF_5501	BMP00017	Micro-Bioretention 1 at Shady Grove Garage	E	MMBR	NEWD	2019-01-15	P	Filter media depth determined from overflow inlet inverts
USG19BMP00018	2019	519034.5219	1255804.867	13-SF_5501	BMP00018	Bioretention 9 at Parking Lot 1	S	FBIO	NEWD	2019-01-11	P	
USG19BMP00019	2019	518987.7487	1255940.589	13-SF_5501	BMP00019	Bioretention 8 at Parking Lot 1	S	FBIO	NEWD	2019-01-15	F	Bio8 (ID#19)
USG19BMP00020	2019	518927.5428	1255957.518	13-SF_5501	BMP00020	Bioretention 7 at Parking Lot 1	S	FBIO	NEWD	2019-01-11	F	Bio7 (ID#20)
USG19BMP00021	2019	518957.6516	1255799.083	13-SF_5501	BMP00021	Bioretention 5 at Parking Lot 1	S	FBIO	NEWD	2019-01-11	F	Bio5 (ID#21)
USG19BMP00022	2019	518898.5497	1255799.937	13-SF_5501	BMP00022	Bioretention 6 at Parking Lot 1	S	FBIO	NEWD	2019-01-11	F	Bio6 (ID#22)
USG19BMP00023	2019	519019.3106	1255689.905	13-SF_5501	BMP00023	Micro-Bioretention 3 at New Campus Entry	E	MMBR	REDE	2019-01-11	P	
USG19BMP00024	2019	519023.6075	1255535.319	13-SF_5501	BMP00024	Micro-Bioretention 2 at New Campus Entry	E	MMBR	REDE	2019-01-11	P	
USG19BMP00025	2019	518975.3435	1255510.666	13-SF_5501	BMP00025	Micro-Bioretention 1 at New Campus Entry	E	MMBR	REDE	2019-01-11	P	
USG19BMP00026	2019	518828.7667	1255232.406	13-SF_5501	BMP00026	Gudelsky Pond	S	PWET	NEWD	2019-01-08	P	Credit Sharing with Montgomery County
USG19BMP00027	2019	519725.6101	1255376.7	13-SF_5501	BMP00027	BSE ESD-13	E	MMBR	REDE			Under Construction
USG19BMP00028	2019	519304.9925	1255129.179	13-SF_5501	BMP00028	BSE ESD-9	E	MMBR	REDE			Under Construction
USG19BMP00029	2019	519366.7919	1255092.352	13-SF_5501	BMP00029	BSE ESD-10	E	MMBR	REDE			Under Construction
USG19BMP00030	2019	519345.1755	1255208.468	13-SF_5501	BMP00030	BSE ESD-5	E	MMBR	REDE			Under Construction
USG19BMP00031	2019	519465.6306	1255154.706	13-SF_5501	BMP00031	BSE ESD-3	E	MMBR	REDE			Under Construction
USG19BMP00032	2019	519631.0952	1255183.889	13-SF_5501	BMP00032	BSE Cistern #1	E	MRWH	REDE			Under Construction
USG19BMP00033	2019	519453.6789	1255450.295	13-SF_5501	BMP00033	BSE Cistern #2	E	MRWH	REDE			Under Construction
USG19BMP00034	2019	519402.1403	1255353.338	13-SF_5501	BMP00034	BSE ESD-6	E	MMBR	REDE			Under Construction
USG19BMP00035	2019	519490.542	1255054.97	13-SF_5501	BMP00035	BSE ESD-12	E	MMBR	REDE			Under Construction
USG19BMP00036	2019	519435.6445	1255071.824	13-SF_5501	BMP00036	BSE ESD-11	E	MMBR	REDE			Under Construction
USG19BMP00037	2019	519526.4323	1255136.752	13-SF_5501	BMP00037	BSE ESD-2	E	MMBR	REDE			Under Construction
USG19BMP00038	2019	519591.3003	1255112.815	13-SF_5501	BMP00038	BSE ESD-1	E	MMBR	REDE			Under Construction
USG19BMP00039	2019	519389.074	1255183.141	13-SF_5501	BMP00039	BSE ESD-4	E	MMBR	REDE			Under Construction
USG19BMP00040	2019	519446.3931	1255431.162	13-SF_5501	BMP00040	BSE ESD-7	E	MMBR	REDE			Under Construction
USG19BMP00041	2019	519570.7977	1255445.483	13-SF_5501	BMP00041	BSE ESD-14	E	MIBR	REDE			Under Construction
USG19BMP00042	2019	519322.7953	1255971.434	13-SF_5501	BMP00042	IBBR Non-Rooftop Disconnect	E	NDNR	NEWD			Under Construction

Note: The following template is based on recent MD Phase II NPDES data reporting requirements. Definitions of each column and data elements can be found in the three descriptions sheets.

Note: Several Example BMPs have been incorporated to help display the new structure.

¹ Every BMP Identified in this table should match BMP_ID data entered in either "Table B1.b._ESD.STRUCTURAL" sheet or "Table B.1.c._Alternative" sheet

² Northing and Easting are geographic points used to locate BMPs, Maryland requires using State Plane NAD 83 meters for geographic location. You can use Geographic Information Systems (GIS) or other computer programs to provide these coordinates.

APPENDIX A: BMP DATABASE BASELINE DOCUMENTS. TABLE B.1.b

Table B.1.b. Reporting Requirements for ESD and Structural Practices

More specific data related to ESD and structural BMPs is populated in this table.

BMP_ID ¹	NUM_BMPS ²	ON_OFF_SITE	CONVERTED_FROM	BMP_STATUS	BMP_DRAIN_AREA	IMP_ACRES ³	PE_ADR	APPR_DATE	BUILT_DATE	GEN_COMMENTS
USG19BMP00001	1	ON		ACT	1.05	0.73	0	11/11/2008	1/1/2009	pre-treatment only
USG19BMP00002	1	ON		ACT	2.91	1.93	0.07	4/12/1995	6/30/1997	Plans show excessive sand and filter cloth, recommend reconstruction.
USG19BMP00003	1	ON		ACT	0.28	0.14	0.5	12/4/2002	8/1/2006	
USG19BMP00005	1	ON		ACT	0.08	0.06	1.08	12/4/2002	8/1/2006	
USG19BMP00006	1	ON		ACT	0.59	0.48	0.78	12/4/2002	8/1/2006	
USG19BMP00007	1	ON		ACT	2.84	1.11	2.6	1/1/1980	1/1/1980	
USG19BMP00008	1	ON		ACT	0.19	0.19	0	2/16/2004	1/1/2007	
USG19BMP00009	1	ON		ACT	0.22	0.15	0	2/16/2004	1/1/2007	Pre-treatment only - Plans had +0.11 unaccounted drainage area
USG19BMP00010	1	ON		REM	0.51	0.40	1	5/13/2016		Under Construction
USG19BMP00012	1	ON		ACT	0.44	0.15	2.25	1/1/2015	4/1/2016	Filter media depth determined from overflow inlet inverts
USG19BMP00013	1	ON		ACT	0.43	0.33	0.65	1/1/2015	4/1/2016	Treatment filter depth assumed from Typical MDE Designs STD
USG19BMP00014	1	ON		ACT	0.43	0.29	1.54	1/1/2015	4/1/2016	Treatment filter depth assumed from Typical MDE Designs STD
USG19BMP00015	1	ON		ACT	0.45	0.29	1.29	1/1/2015	4/1/2016	Filter media depth determined from overflow inlet inverts
USG19BMP00017	1	ON		ACT	0.44	0.36	0.71	1/1/2015	4/1/2016	Filter media depth determined from overflow inlet inverts
USG19BMP00018	1	ON		ACT	0.18	0.06	0.39	8/1/2004	1/1/2006	
USG19BMP00019	1	ON		ACT	0.37	0.31	0.92	8/1/2004	1/1/2006	
USG19BMP00020	1	ON		ACT	0.50	0.35	0.7	8/1/2004	1/1/2006	
USG19BMP00021	1	ON		ACT	0.47	0.43	0.29	8/1/2004	1/1/2006	
USG19BMP00022	1	ON		ACT	0.69	0.47	0.48	8/1/2004	1/1/2006	
USG19BMP00023	1	ON		ACT	0.58	0.18	0.93	10/16/2014	7/1/2016	
USG19BMP00024	1	ON		ACT	0.47	0.26	0.9	10/16/2014	7/1/2016	
USG19BMP00025	1	ON		ACT	0.49	0.29	0.64	10/16/2014	7/1/2016	Drainage area modified to reflect new installed inlet
USG19BMP00026	1	ON		ACT	95.07	44.62	2.6	5/1/1986	1/1/1988	DA Digitized using Gudulsky plans and New Entry Plans
USG19BMP00027	1	On		REM	0.17	0.06	2.6	5/13/2016		Under Construction
USG19BMP00028	1	On		REM	0.23	0.12	1.4	5/13/2016		Under Construction
USG19BMP00029	1	On		REM	0.15	0.09	1.4	5/13/2016		Under Construction
USG19BMP00030	1	On		REM	0.19	0.11	1.3	5/13/2016		Under Construction
USG19BMP00031	1	On		REM	0.21	0.14	1	5/13/2016		Under Construction
USG19BMP00032	1	On		REM	0.75	0.75	1	5/13/2016		Under Construction
USG19BMP00033	1	On		REM	0.11	0.11	2.6	5/13/2016		Under Construction
USG19BMP00034	1	On		REM	0.42	0.12	1	5/13/2016		Under Construction
USG19BMP00035	1	On		REM	0.11	0.07	1.4	5/13/2016		Under Construction
USG19BMP00036	1	On		REM	0.10	0.06	1.4	5/13/2016		Under Construction
USG19BMP00037	1	On		REM	0.20	0.12	1	5/13/2016		Under Construction
USG19BMP00038	1	On		REM	0.06	0.02	1	5/13/2016		Under Construction
USG19BMP00039	1	On		REM	0.18	0.12	1.3	5/13/2016		Under Construction
USG19BMP00040	1	On		REM	0.33	0.19	1	5/13/2016		Under Construction
USG19BMP00041	1	On		REM	0.12	0.04	2.6	5/13/2016		Under Construction
USG19BMP00042	1	ON		ACT	0.03	0.03	1	4/1/2017		Under Construction

Note: Several Example BMPs have been incorporated to help display the new structure.

¹ Every BMP Identified in this table should correspond to "BMP" sheet.

² If BMP Class is Structural ("S") then this column will always = 1, if BMP Class is ESD to MEP ("E") then you can report the number of BMPs in a system.

³ If Impervious acres treated is unknown, model credit may still be gained, but no permit credit will be gained.

APPENDIX A: BMP DATABASE BASELINE DOCUMENTS. TABLE B.1.C

Table B.1.c Reporting Requirements for Alternative BMPs

More specific data related to alternative BMPs is populated in this table.

BMP_ID ¹	PROJECT_DESC	PROJECT_LENGTH	ACRES_SWEPT	TIMES_SWEPT	ACRES_PLANTED	IMP_ACR_ELIM	EQU_IMP_ACR	INSTALL_DATE	IMPL_COMP_YR	GEN_COMMENTS
USG19BMP00004	Outfall Stabilization		50				0.5	8/1/2006	2006	

¹ Every BMP Identified in this table should correspond to "BMP" sheet.

Appendix B

The 20% Restoration Goal Requirements

The following pages (extracted from MES' report) provide documentation that USG's campus meets stormwater requirements and 20% restoration is not required. This documentation is specifically detailed in the sections enclosed by the red box. Also, the sections highlighted in yellow provide information regarding credit trading available due to the capacity of USG's Gudelsky Pond.

APPENDIX B:THE 20% RESTORATION GOAL REQUIREMENTS

An additional 16 facilities were included in the geodatabase for submission to MDE but were not inspected because they are currently under construction at the new Biomedical Sciences & Engineering (BSE) Building. USG has estimated construction to be completed September 2019. When construction is confirmed completed, the stormwater management facilities should be inspected for completion, functionality, and intended design. As-built records should also be provided at this time.

3.0 MS4 Permit Requirements and Existing Treatment

Though a few of these BMPs as described above are not in good condition, the entirety of the Shady Grove Campus is treated by a large pond on the southwestern side of the campus. Gudelsky Pond treats a drainage area of nearly 100 acres, including all of USG and IBBR and some offsite drainage from Montgomery County (County) as well.

While Gudelsky Pond is located on USG property, maintenance of the pond is shared between USG and the County. Approximately half of the drainage area is from the County's MS4 jurisdiction (see maps located in Appendix C). Originally built in 1987, the pond pre-dates the Shady Grove campus and was built to accommodate development on the (now) Shady Grove property as well as property to the north of the Shady Grove campus (part of the County's MS4 jurisdiction). The pond is a regional pond and is designed to handle future development, up to 72% impervious coverage within the pond's drainage area (see the agreement in Appendix D). **Currently, the drainage area is 47% impervious, leaving capacity for future development or credit trading.**

In 1996, when the County was transferring the property to USG-IBBR, USG entered into an agreement with Montgomery County regarding maintenance obligations of the pond. It was determined and agreed upon that USG would provide landscaping and trash removal maintenance for the pond while the County would provide maintenance to keep the pond in proper working condition, including structural repairs and improvements. The County also agreed to have accumulated sediment removed at the County's discretion when necessary for the proper functioning of the pond. Removal of sediment from the pond for recreational or aesthetic purposes would be the responsibility of USG. USG was also to remove solid waste and control weeds at the pond. The County has performed annual inspections on Gudelsky pond and the latest two reports from 2016 and 2017 have been provided to MES by USG.

3.1 Permit Requirements

By October 31, 2019, at the end of USG's NPDES MS4's first year's permit cycle, USG is responsible for determining how much of their campus is currently treated by existing stormwater facilities. Additionally, the untreated impervious areas will be summed, and the total will be multiplied by 20% in order to determine the restoration goal. This restoration goal is what will need to be treated in future years. As an example, if USG currently has 10 acres of untreated impervious area, then additional stormwater facilities will need to be implemented in future years to treat two acres of this untreated impervious area.

3.2 Determination of baseline treatment

MES evaluated all BMPs on the Shady Grove campus to determine if the BMP is functioning well and how much impervious area credit should be credited to the campus. The first step was to review plans

APPENDIX B:THE 20% RESTORATION GOAL REQUIREMENTS

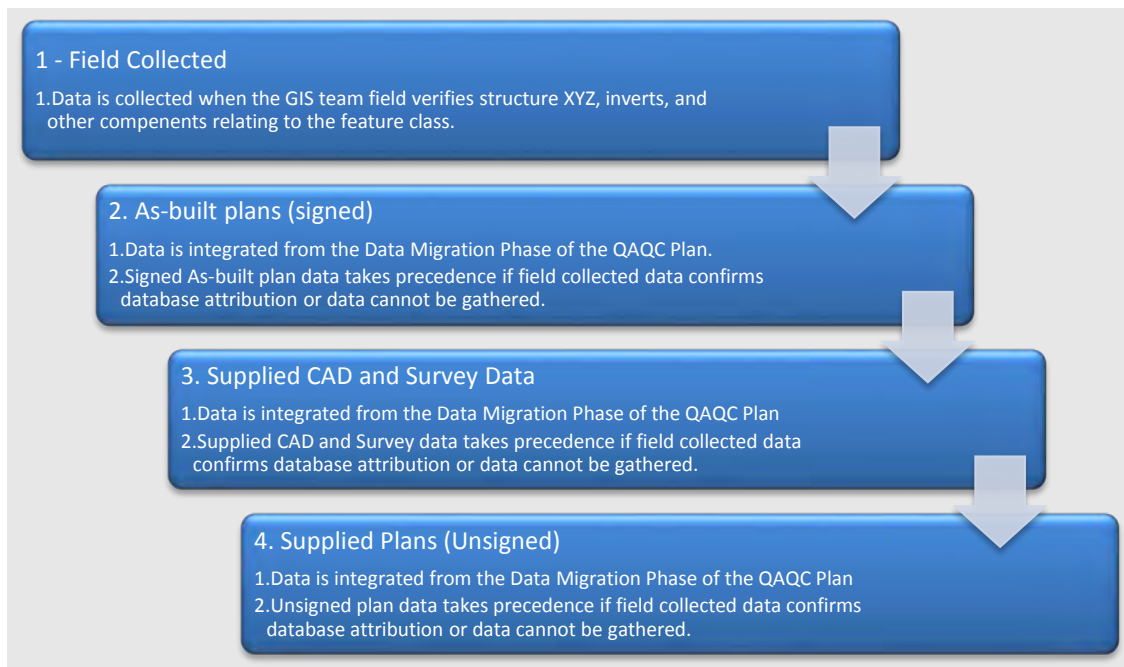
which were provided by USG to determine what data was known and what data would need to be gathered.

BMP drainage areas were digitized from provided stormwater management plans and CAD data when available. For BMPs without specified drainage areas in the provided plans or if the drainage appeared to have been significantly modified from the original conditions, MES used engineering judgement to delineate a new drainage area. MES determined this utilizing the surrounding stormwater networks, 2' contours, and field observations.

MES built the stormwater network in an ESRI Geodatabase and it accounts for USG-IBBR's MS4 permit analysis, future development, and maintenance. MES collected and populated the stormwater network relying on Survey Data, As Built Plans, Design Plans, GPS-Field Collection, and Verification. No survey grade data was collected by MES as part of this project and GPS data was collected using a Trimble Geo7x at 10-centimeter accuracy. In instances where as-built data did not match observed field conditions or measurements, field collected data trumped as-built survey-grade data. See MES's QAQC plan for collecting stormwater data in Appendix E.

The hierarchy of data sources for database attribution

MES uses a hierarchy for determining the accuracy of field collected data versus data shown on plans, as detailed in the graphic below. Field collected data would be considered the most accurate and would be used in cases where there is a discrepancy on the plans.



MES used computation spreadsheets to evaluate the treatment amounts for all BMPs on campus. A summarization of these results is provided below in Table 2, as well as the computations spreadsheets for each BMP are located in Appendix F (for ESD and Structural practices) and Appendix G (for

APPENDIX B:THE 20% RESTORATION GOAL REQUIREMENTS

Alternative practices). All of the computations are for the existing BMPs, except for the four facilities in Parking Lot 1, where the proposed computations based on repairing the devices to accommodate a 12” ponding depth have been included, as detailed below in Section 4.0.

BMP ID	BMP NAME	BMP TYPE	Impervious Acres Credits (ac)	Pe	Status
USG19BMP00001	Travilla Gateway Garage Baysaver	Oil Grit Separator	0	0	Pretreatment
USG19BMP00002	Building 2 Sand Filter	Sand Filter	0.14	0.07	Fail
USG19BMP00003	Infiltration Trench 1 at IBBR	Infiltration Trench	0.07	0.5	Fail
USG19BMP00004	IBBR Outfall Stabilization	Outfall Stabilization	0.5	-	Alternate
USG19BMP00005	Infiltration Trench 2 at IBBR	Infiltration Trench	0.06	1.08	Pass
USG19BMP00006	Infiltration Trench 3 at IBBR	Infiltration Trench	0.37	0.78	Fail
USG19BMP00007	IBBR Pond	Retention Pond (Wet Pond)	1.55	2.6*	Pass
USG19BMP00009	Building 3 Baysaver	Oil Grit Separator	0	0	Pretreatment
USG19BMP00012	Micro-Bioretenention 4 at Shady Grove Garage	Micro-Bioretenention	0.19	2.25	Pass
USG19BMP00013	Micro-Bioretenention 5 at Shady Grove Garage	Micro-Bioretenention	0.22	0.65	Pass
USG19BMP00014	Micro-Bioretenention 3 at Shady Grove Garage	Micro-Bioretenention	0.33	1.54	Pass
USG19BMP00015	Micro-Bioretenention 2 at Shady Grove Garage	Micro-Bioretenention	0.31	1.29	Pass
USG19BMP00017	Micro-Bioretenention 1 at Shady Grove Garage	Micro-Bioretenention	0.26	0.71	Pass
USG19BMP00018	Bioretenention 9 at Parking Lot 1	Bioretenention	0.02	0.39	Pass
USG19BMP00019	Bioretenention 8 at Parking Lot 1	Bioretenention	0.28	0.92	Fail
USG19BMP00020	Bioretenention 7 at Parking Lot 1	Bioretenention	0.24	0.7	Fail
USG19BMP00021	Bioretenention 5 at Parking Lot 1	Bioretenention	0.13	0.29	Fail
USG19BMP00022	Bioretenention 6 at Parking Lot 1	Bioretenention	0.23	0.48	Fail
USG19BMP00023	Micro-Bioretenention 3 at New Campus Entry	Micro-Bioretenention	0.16	0.93	Pass
USG19BMP00024	Micro-Bioretenention 2 at New Campus Entry	Micro-Bioretenention	0.24	0.9	Pass
USG19BMP00025	Micro-Bioretenention 1 at New Campus Entry	Micro-Bioretenention	0.19	0.64	Pass
USG19BMP00026	Gudelsky Pond	Retention Pond (Wet Pond)	62.5	2.6*	Pass

Table 2 - Summary of BMP Treatment Amounts on USG-IBBR property

(Pe values shown with a * are actually treating greater than 2.6”, but MDE guidance allows a maximum treatment of 2.6”)

Table 3 shows that Gudelsky Pond currently treats 2.6” of the runoff within the drainage area, well in excess of MDE’s requirement to treat 1” of runoff. Thus, any of the existing impervious surface within Gudelsky Pond’s drainage area would be considered already treated. The water quality storage provided by Gudelsky Pond is shown in Table 4 below.

Table 3 - Gudelsky Pond treatment amounts

Drainage Area (Ac)	Impervious Drainage Area (Ac)	Required Treatment Volume @ 1" (cu ft)	Provided WQv Volume (cu ft)	Pe (in)	Impervious acreage credit (Ac)
94.87	44.64	162,043.2	435,090.4	2.6	62.5

There are a number of BMPs located within Gudelsky Pond’s drainage area, including on the Shady Grove Campus and within the County’s jurisdiction. Even without subtracting these BMPs from Gudelsky Pond’s treatment area, the pond is still treating 2.6”, and is actually treating even more, once the smaller BMPs are subtracted out. MES has evaluated all of the BMPs located on USG & IBBR’s property and has determined that there is an additional 3.53 acres which are treated from the smaller BMPs, which could be subtracted from Gudelsky Pond’s treatment (thus increasing the amount of credits which could be shared with a partner).

APPENDIX B:THE 20% RESTORATION GOAL REQUIREMENTS

Table 4 - Gudelsky Pond Stage Storage Table

Stage Storage Table					
Project Name: USG - Gudelsky Pond					
Date: 10/25/2018					
Elevation (ft)	Area (sq ft)	Difference (ft)	Incremental Volume (cu ft)	Cumulative Volume (cu ft)	Cumulative Volume (ac ft)
422	955	-	0	0	0
424	31,356	2.00	32,311	32,311	0.74
426	39,595	2.00	70,951	103,262	2.37
428	47,662	2.00	87,257	190,519	4.37
430	55,907	2.00	103,569	294,088	6.75
432.2	72,277	2.20	141,002	435,090	9.99

The total drainage area to Gudelsky pond is 94.87 acres and the total impervious acreage is 44.64 acres. Of this, USG-IBBR's property is 41.62 total acres, with 18.15 impervious acres, while the off-site area is 53.25 total acres, with 26.49 impervious acres (See Table 5). If the treatment from the smaller BMPs located on USG-IBBR's property are subtracted from Gudelsky Pond's treatment amount, but without subtracting out the acreages from the smaller BMPs located within the County's jurisdiction, due to the excess storage in Gudelsky Pond, there are 21.39 acres of additional credit available. In summary, there are quite a few BMPs located within Gudelsky Pond's drainage area, but even without subtracting out all of the credits, the pond is still treating 2.6", the maximum amount allowed per MDE. The entire Shady Grove campus drains to Gudelsky Pond and thus is considered fully treated, as is. The excess credit at Gudelsky Pond could be shared with a partner or sold on Maryland's nutrient trading website.

Table 3 – Drainage Area to Gudelsky Pond

Total DA	Total Impervious	Total % Impervious	USG Total	USG Impervious	USG % Impervious	IBBR Total	IBBR Impervious	IBBR % Impervious	Off-Site Total	Off-Site Impervious	Off-Site % Impervious
94.87 Ac	44.64 Ac	46.9%	29.44 Ac	13.71 Ac	46.6%	12.18 Ac	4.44 Ac	36.5%	53.25 Ac	26.49 Ac	50.0%

4.0 Maintenance Recommendations for Parking Lot 1 Bioretention Facilities

There are four stormwater management facilities located within Parking Lot 1 of the Shady Grove campus. These bioretention facilities were originally constructed in 2005. Two of the facilities were expanded to accommodate an expansion to the parking lot in 2007. In recent years, these facilities have not functioned well. The facilities are not well landscaped, have overly deep ponding areas, have erosion at all of the inflows, and have failing curb around the exterior sides. The facilities are located in a sump and lack a good overflow for large rain events and also have more ponding depth than is recommended, per MDE's guidance.

When these facilities were originally designed, they were designed as bioretention facilities, which require pretreatment. The bioretentions are not up to current standards and in order to accommodate a properly designed pretreatment area, more space would be needed. Since each of these facilities are treating less than ½ acre of impervious surface, the facilities can be considered as micro-bioretention

Appendix C

USG's Restoration Work Plan (for the failing BMP's)

The Universities at Shady Grove commissioned Maryland Environmental Service (MES) to perform a full assessment of the storm drain and stormwater infrastructure on USG's campus. As part of MES' findings, seven BMP's on campus are in need of repair; four are bioretention ponds, two are infiltration trenches and one is a sand filter. The repairs needed to bring these facilities up to current standards are elaborate and quite extensive. Due to the needed repairs, the unexpected costs and budget constraints, USG expects this to be an ongoing, phased process and will address the most egregious of the failing BMP's first. Listed below is USG's priority list for making the repairs to the failing BMP's. This is projected to be a five year plan, with the understanding that the costs need to be added to our five-year budget forecast.

- 1) Make repairs to the four-Bioswales/Bioretention ponds at Parking Lot 1.
- 2) Make repairs to the Sand Filter behind Building II.

The following documents (extracted from MES' report) identify the failing BMP's and make the recommendations for the repairs.

APPENDIX C: RESTORATION WORKPLAN FOR THE FAILING BMP'S:
BIOSWALES AT PARKING LOT 1

Stormwater Management Facility BMP Inspection

Inspection Data

Date of Inspection:	01/15/2019 2:39 PM	Inspector Initials	SAL,JK,CAB
BMP ID	USG19BMP00019	Inspection Firm	MES
BMP Type:	Bioretention	Underground BMP?	No
Rating:	C - Failing, needs major maintenance	Overall Inspection Comment	Major erosion at inflows - undermining of western curb, Vegetation Removed from BMP 2013. Repair erosion, replace bioretention plants, remove tree, and remediate BMP to current MDE standards. +/-12" ponding depth in BMP

Overall Photo



APPENDIX C: RESTORATION WORKPLAN FOR THE FAILING BMP'S: BIOSWALES AT PARKING LOT 1

Site Conditions

- **BMP Access** - Good
- **Debris & Sediment** - Good
- **Vegetation** - Poor
 - Non-Woody Vegetation Removed 2013, Maple trees show evidence of distressed health
- **BMP Contamination** - Good
- **Inflow Condition** - Poor
 - Undermining of curbing at west curb opening. Erosion at Gravel Curtain Drain
- **Forebay** - Not Rated
 - Not Part of Design
- **Conveyance Stability** - Fair
- **Downstream Condition** - Not Rated
 - Site outfalls to existing stormwater network

Embankment

- **Embankment Cover** - Poor
- **Upstream Embankment** - Poor
 - Erosion at embankment around inflows to BMP
- **Downstream Embankment** - Not Rated
 - Not Part of Design
- **Emergency Spillway** - Not Rated
 - Not Part of Design

Ponding, Outlet/Control Structure, Outfall

- **Ponding** - Good / **Water Depth** – 0 ft
- **Low Flow Orifice** - Not Rated
- **Outlet / Control Structure** - Good
- **Principal Spillway** - Good
- **Spillway Outfall** - Good

Overall Rating - C - Failing, needs major maintenance

Maintenance & Remediation Recommendations

The bioretention is considered failing and requires major maintenance to restore to functioning condition. Maintenance recommendations to restore the bioretention to a functioning condition include: Regrade and restore bioretention to design criteria. Replanting of MDE approved bio-wetland plants. MES recommends removing the maple tree and replace with other MDE approved bioretention plants. Restore parking lot curb along perimeter/inflows of the bioretention facility. Perform additional maintenance as directed by project engineer to restore structural integrity of the surrounding parking lot.

APPENDIX C: RESTORATION WORKPLAN FOR THE FAILING BMP'S:
BIOSWALES AT PARKING LOT 1

Additional Comment & Inspection Rating



Principal Spillway



Inflow - Curb Cut, Facing West, Curb Damaged and Undermined

APPENDIX C: RESTORATION WORKPLAN FOR THE FAILING BMP'S:
BIOSWALES AT PARKING LOT 1

Stormwater Management Facility BMP Inspection

Inspection Data

Date of Inspection:	01/11/2019 2:09 PM	Inspector Initials	SAL,JK,CAB
BMP ID	USG19BMP00020	Inspection Firm	MES
BMP Type:	Bioretention	Underground BMP?	No
Rating:	C - Failing, needs major maintenance	Overall Inspection Comment	Erosion at curb cut inflow and gravel curtain drain, excessive ponding potential at overflow device, vegetation removed 2013. Repair erosion, replace bioretention plants, remove tree, and remediate BMP to current MDE standards. +/-12" ponding depth in BMP

Overall Photo



APPENDIX C: RESTORATION WORKPLAN FOR THE FAILING BMP'S: BIOSWALES AT PARKING LOT 1

Site Conditions

- **BMP Access** - Good
- **Debris & Sediment** - Good
- **Vegetation** - Poor
 - Non-Woody Vegetation Removed 2013, Maple trees show evidence of distressed health
- **BMP Contamination** - Good
- **Inflow Condition** - Poor
 - Erosion at inflows of curb cuts surrounding the BMP. Evidence of parking lot integrity being undermined. Erosion at gravel curtain drain
- **Forebay** - Not Rated
 - Not Part of Design
- **Conveyance Stability** - Poor
 - Erosive channel along embankment
- **Downstream Condition** - Not Rated
 - Site outfalls to existing stormwater network

Embankment

- **Embankment Cover** - Poor
- **Upstream Embankment** - Poor
 - Erosion of upstream embankment
- **Downstream Embankment** - Not Rated
 - Not Part of Design
- **Emergency Spillway** - Not Rated
 - Not Part of Design

Ponding, Outlet/Control Structure, Outfall

- **Ponding** - Good / **Water Depth** – 0 ft
- **Low Flow Orifice** - Not Rated
- **Outlet / Control Structure** - Good
- **Principal Spillway** - Good
- **Spillway Outfall** - Good

Overall Rating - C - Failing, needs major maintenance

Maintenance & Remediation Recommendations

The bioretention is considered failing and requires major maintenance to restore to functioning condition. Maintenance recommendations to restore the bioretention to a functioning condition include: Regrade and restore bioretention to design criteria. Replanting of MDE approved bio-wetland plants. MES recommends removing the maple tree and replace with other MDE approved bioretention plants. Restore parking lot curb along perimeter/inflows of the bioretention facility. Perform additional maintenance as directed by project engineer to restore structural integrity of the surrounding parking lot.

APPENDIX C: RESTORATION WORKPLAN FOR THE FAILING BMP'S:
BIOSWALES AT PARKING LOT 1



Erosion at Inflow B - Curb Cut - Facing West



Erosion at Gravel Curtain - Facing North

APPENDIX C: RESTORATION WORKPLAN FOR THE FAILING BMP'S:
BIOSWALES AT PARKING LOT 1

Stormwater Management Facility BMP Inspection

Inspection Data

Date of Inspection:	01/11/2019 12:23 PM	Inspector Initials	SAL,JK,CAB
BMP ID	USG19BMP00021	Inspection Firm	MES
BMP Type:	Bioretention	Underground BMP?	No
Rating:	C - Failing, needs major maintenance	Overall Inspection Comment	Erosion at curb cut inflow and gravel curtain drain, excessive ponding potential at overflow device, vegetation removed 2013. Repair erosion, replace bioretention plants, remove tree, and remediate BMP to current MDE standards. +/-12" ponding depth in BMP

Overall Photo



APPENDIX C: RESTORATION WORKPLAN FOR THE FAILING BMP'S: BIOSWALES AT PARKING LOT 1

Site Conditions

- **BMP Access** - Good
- **Debris & Sediment** - Fair
- **Vegetation** - Poor
 - BMP Vegetation Removed 2013, Maple trees show evidence of distressed health
- **BMP Contamination** - Good
- **Inflow Condition** - Poor
 - Erosion at inflows of curb cuts surrounding the BMP. Evidence of parking lot integrity being undermined. Erosion at gravel curtain drain
- **Forebay** - Poor
 - Erosion of Curtain Drain Pretreatment
- **Conveyance Stability** - Fair
- **Downstream Condition** - Not Rated
 - Site outfalls to existing stormwater network

Embankment

- **Embankment Cover** - Poor
- **Upstream Embankment** - Poor
 - Erosion at embankment around inflows to BMP
- **Downstream Embankment** - Not Rated
 - Not Part of Design
- **Emergency Spillway** - Not Rated
 - Not Part of Design

Ponding, Outlet/Control Structure, Outfall

- **Ponding** - Good / **Water Depth** – 0 ft
- **Low Flow Orifice** - Not Rated
- **Outlet / Control Structure** - Good
- **Principal Spillway** - Good
- **Spillway Outfall** - Good

Overall Rating - C - Failing, needs major maintenance

Maintenance & Remediation Recommendations

The bioretention is considered failing and requires major maintenance to restore to functioning conditions. Maintenance recommendations to restore the bioretention to functioning conditions include: Removal of debris, unplanned and woody vegetation within facility. Replanting of MDE approved bioorientation plants according to design. Repair of eroded areas at the inflows and gravel curtain drain. Investigation of underdrain for potential clogging and removal of sediment if necessary. Removal of any sediment build up on surface of facility or addition of mulch to meet MDE ponding depth requirement.

APPENDIX C: RESTORATION WORKPLAN FOR THE FAILING BMP'S:
BIOSWALES AT PARKING LOT 1

Additional Comment & Inspection Rating



Erosion at inflow, water flows under curbing



Overall, Overflow Device

APPENDIX C: RESTORATION WORKPLAN FOR THE FAILING BMP'S:
BIOSWALES AT PARKING LOT 1

Stormwater Management Facility BMP Inspection

Inspection Data

Date of Inspection:	01/11/2019 1:48 PM	Inspector Initials	SAL,JK,CAB
BMP ID	USG19BMP00022	Inspection Firm	MES
BMP Type:	Bioretention	Underground BMP?	No
Rating:	C - Failing, needs major maintenance	Overall Inspection Comment	Erosion at curb cut inflow and gravel curtain drain, excessive ponding potential at overflow device, vegetation removed 2013. Repair erosion, replace bioretention plants, remove tree, and remediate BMP to current MDE standards. +/-12" ponding depth in BMP

Overall Photo



APPENDIX C: RESTORATION WORKPLAN FOR THE FAILING BMP'S: BIOSWALES AT PARKING LOT 1

Site Conditions

- **BMP Access** - Good
- **Debris & Sediment** - Good
- **Vegetation** - Poor
 - Non-Woody Vegetation Removed 2013, Maple trees show evidence of distressed health
- **BMP Contamination** - Good
- **Inflow Condition** - Poor
 - Erosion at inflows of curb cuts surrounding the BMP. Evidence of parking lot integrity being undermined. Erosion at gravel curtain drain
- **Forebay** - Not Rated
 - Gravel Curtain Drain Eroded and Riprap added
- **Conveyance Stability** - Fair
- **Downstream Condition** - Not Rated
 - Site outfalls to existing stormwater network

Embankment

- **Embankment Cover** - Poor
- **Upstream Embankment** - Poor
 - Erosion at embankment around inflows to BMP
- **Downstream Embankment** - Not Rated
 - Not Part of Design
- **Emergency Spillway** - Not Rated
 - Not Part of Design

Ponding, Outlet/Control Structure, Outfall

- **Ponding** - Good / **Water Depth** – 0 ft
- **Low Flow Orifice** - Not Rated
- **Outlet / Control Structure** - Good
- **Principal Spillway** - Good
- **Spillway Outfall** - Good

Overall Rating - C - Failing, needs major maintenance

Maintenance & Remediation Recommendations

The bioretention is considered failing and requires major maintenance to restore to functioning condition. Maintenance recommendations to restore the bioretention to a functioning condition include: Regrade and restore bioretention to design criteria. Replanting of MDE approved bio-wetland plants. MES recommends removing the maple tree and replace with other MDE approved bioretention plants. Restore parking lot curb along perimeter/inflows of the bioretention facility. Perform additional maintenance as directed by project engineer to restore structural integrity of the surrounding parking lot.

APPENDIX C: RESTORATION WORKPLAN FOR THE FAILING BMP'S:
BIOSWALES AT PARKING LOT 1

Additional Comment & Inspection Rating



Sediment within Curtain Drain, Erosion at Curb Cut



Overall, Facing North

APPENDIX C: RESTORATION WORKPLAN FOR THE FAILING BMP'S:
THE SAND FILTER BEHIND BUILDING II

Stormwater Management Facility BMP Inspection

Inspection Data

Date of Inspection:	01/15/2019 8:30 AM	Inspector Initials	SAL,JK,CAB
BMP ID	USG19BMP00002	Inspection Firm	MES
BMP Type:	Sand Filter	Underground BMP?	No
Rating:	C - Failing, needs major maintenance	Overall Inspection Comment	Excessive unwanted vegetation, embankment blown out at wier, ponding, BMP designed with excess sand, tree growth on embankment. Remove vegetation, remediate to MDE criteria, restore embankment to design criteria

Overall Photo



APPENDIX C: RESTORATION WORKPLAN FOR THE FAILING BMP'S: THE SAND FILTER BEHIND BUILDING II

Site Conditions

- **BMP Access** - Good
- **Debris & Sediment** - Fair
- **Vegetation** - Poor
 - Overgrown Vegetation, invasive species present, cattail growth reducing treatment capacity
- **BMP Contamination** - Good
- **Inflow Condition** - Fair
- **Forebay** - Not Rated
 - Not Part of Design
- **Conveyance Stability** - Fair
- **Downstream Condition** - Good

Embankment

- **Embankment Cover** - Poor
- **Upstream Embankment** - Poor
 - Embankment blown out at control structure
- **Downstream Embankment** - Poor
 - Embankment blown out at control structure
- **Emergency Spillway** - Not Rated
 - Not Part of Design

Ponding, Outlet/Control Structure, Outfall

- **Ponding** - Poor / **Water Depth** - 0.5 ft
- **Low Flow Orifice** - Not Rated
- **Outlet / Control Structure** - Not Rated
 - Not Part of Design
- **Principal Spillway** - Not Rated
- **Spillway Outfall** - Fair

Overall Rating - C - Failing, needs major maintenance

Maintenance & Remediation Recommendations

The sand filter is considered failing and requires major maintenance to restore to functioning condition. Maintenance recommendations to restore the sand filter to functioning condition include: Removal of debris, unplanned and woody vegetation within a 10' buffer around the facility. Daylight 8" PVC inflow and repair and reset riprap at inflow. Removal of sediment and vegetation within the facility and dispose at an approved location. Excavation and reinstallation of the sand filter. Regrade the embankment to original design. If ENAKMAT 4010 device is compromised, reconstruct as designed. Removal of debris, unplanned and woody vegetation within a 15' from the downstream and upstream toe of the embankment and control structure. Recommend installing an underdrain and forebay to bring to approved MDE design standards. Facility may not be feasible in current location due to low grade and adjacent wetland. Site is located on type C soils.