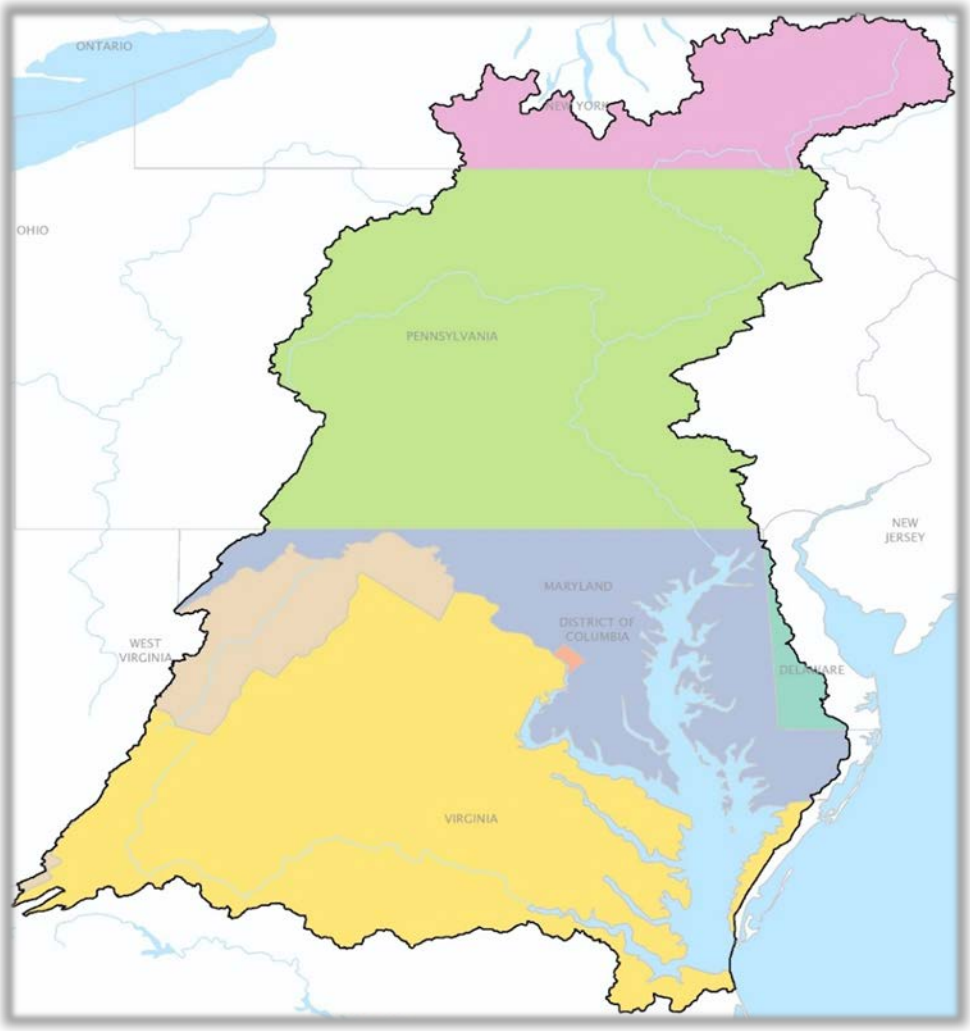
CHESAPEAKE BAY TMDL ACTION PLAN

(2013-2018 MS4 General Permit)

A Plan for Achieving a 5% Reduction of Existing Loads

September 30, 2016



This plan satisfies the requirements of Section I(C) of the MS4 General Permit (9VAC25-890-40) for Special Conditions for the Chesapeake Bay TMDL. This plan is consistent with the Chesapeake Bay TMDL and the Virginia Phase I and II WIPs to meet the Level 2 (L2) scoping run for existing developed lands as it represents an implementation of 5.0% of L2 as specified in the 2010 Phase I WIP.

Central State Hospital

Petersburg, VA

EEE Consulting, Inc.

EXECUTIVE SUMMARY

Central State Hospital (CSH) is authorized to discharge stormwater from its municipal separate storm sewer system (MS4) under the Virginia Pollutant Discharge Elimination System (VPDES) General Permit for Discharges of Stormwater from Small MS4s (MS4 General Permit). To maintain permit compliance, CSH implements a MS4 Program Plan that includes best management practices (BMPs) to address six minimum control measures (MCMs) and special conditions for the Total Maximum Daily Loads (TMDLs) in which CSH has been assigned a wasteload allocation (WLA). The Environmental Protection Agency (EPA) describes a TMDL as a "pollution diet" that identifies the maximum amount of a pollutant the waterway can receive and still meet water quality standards. A WLA determines the required reduction of the pollutant of concern loadings from the MS4s to meet water quality standards. The MS4 General Permit serves as the regulatory mechanism for addressing the load reductions described in the TMDL, predominantly through the requirement of a TMDL Action Plan.

The Chesapeake Bay TMDL was established by the EPA on December 29, 2010 and initiated WLAs for phosphorus, nitrogen, and total suspended solids (TSS). In response, the Commonwealth of Virginia developed Watershed Implementation Plans (WIPs) that, in part, identify the MS4 General Permit as a mechanism for enforcing load reductions in urban areas. Subsequently, the Commonwealth included special conditions into the latest MS4 General Permit to address the reductions required by the Chesapeake Bay TMDL for the pollutants of concern. The WIPs intended the reductions to be achieved over the course of three 5-year permit cycles, with the first cycle (2013 – 2018) requiring 5% of the reductions be achieved. Reduction requirements for the following two permit cycles are anticipated to increase substantially, requiring an additional 35% and 60% of the reductions be achieved, respectively.

CSH has developed an Action Plan consistent with the Chesapeake Bay Action Plan Guidance Memo (Memo No. 15-2005) issued by the Virginia Department of Environmental Quality (DEQ). The guidance was used to determine the required pollutant load reductions and identify the means and methods for achieving the reductions. The means selected by CSH will be the implementation of street sweeping. Regular employment of street sweeping, along with continued implementation of the CSH MS4 Program Plan, is consistent with the provisions of an iterative MS4 Program and constitutes compliance with the MS4 General Permit standard of reducing pollutants to the maximum extent practicable (MEP).

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Acronyms

BMP	Best Management Practice
CSH	Central State Hospital
CUA	Census Urbanized Area
CWA	Clean Water Act
DBHDS	Department of Behavioral Health and Developmental Services
DEQ	Virginia Department of Environmental Quality
EOS	Edge of Stream
EPA	Environmental Protection Agency
ESC	Erosion and Sediment Control
GIS	Geographic Information System
IDDE	Illicit Discharge Detection and Elimination
LA	Load Allocation
L2	Level 2
MCM	Minimum Control Measure
MEP	Maximum Extent Practicable
MOS	Margin of Safety
MS4	Municipal Separate Storm Sewer System
MS4 General Permit	General Permit for Discharge of Stormwater from Small MS4s
NMP	Nutrient Management Plan
NPDES	National Pollutant Discharge Elimination System
PEOP	Public Education and Outreach Program
POC	Pollutant of Concern
SWCB	State Water Control Board
SWM	Stormwater Management
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
VAC	Virginia Administrative Code
VPDES	Virginia Pollutant Discharge Elimination System
VSMP	Virginia Stormwater Management Program
WIP	Watershed Implementation Plan
WLA	Wasteload Allocation

Definitions

Best Management Practices (BMPs) are schedules of activities, prohibitions of practices, maintenance procedures, and other management practices, including both structural and nonstructural practices, to prevent or reduce the pollution of surface waters and groundwater systems.

Census Urbanized Areas (CUAs) are areas identified as urban by the United States Census Bureau's latest census. MS4 regulations only apply within CUAs.

Existing Sources are pervious and impervious urban land uses served by the MS4 as of June 30, 2009.

Impervious Cover is a surface composed of material that significantly impedes or prevents natural infiltration of water into soil.

Level 2 (L2) Scoping Run is a model run to determine required reductions from urban sources as of June 30, 2009. The L2 reductions are summarized in the following table:

Pollutant of Concern	Regulated Impervious (% Reduction)	Regulated Pervious (% Reduction)
Nitrogen	9	6
Phosphorus	16	7.25
Sediment	20	8.75

Municipal Separate Storm Sewer System (MS4) is a conveyance or system of conveyances including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains that are:

- Owned or operated by a federal entity, state, city, town, county, district, association, or other public body, created by or pursuant to state law that discharges to surface waters;
- Designed or used for collecting or conveying stormwater;
- Not a combined sewer; and
- Not part of a publicly owned treatment works.

New Sources are pervious and impervious urban land uses served by the MS4 developed or redeveloped on or after July 1, 2009.

CSH MS4 Program Plan is the guiding document of the CSH's MS4 Program and includes best management practices to address conditions of the MS4 General Permit.

Pollutants of Concern (POC) for the Chesapeake Bay TMDL are total nitrogen (TN), total phosphorus (TP), and total suspended solids (TSS).

Prior Developed Lands are lands that have been previously utilized for residential, commercial, industrial, institutional, recreation, transportation, or utility facilities or structures, and that will have the impervious areas associated with those uses altered during a land-disturbing activity.

Transitional Sources are regulated land disturbing activities that are temporary in nature and that discharge through the MS4.

1.0 INTRODUCTION AND PURPOSE

"CSH's MS4 program strives to improve environmental compliance, quality, and stewardship through effective management, implementation, and enforcement."

Mandated by Congress under the Clean Water Act (CWA), the National Pollutant Discharge Elimination System (NPDES) program includes Municipal Separate Storm Sewer System (MS4), Construction, and Industrial permits. In Virginia the NPDES program is administered by the Virginia Department of Environmental Quality (DEQ) through the Virginia Stormwater Management Program (VSMP) and the Virginia Pollutant Discharge Elimination System (VPDES). Central State Hospital (CSH) is authorized to discharge stormwater from its MS4 under the VPDES General Permit for Discharges of Stormwater from Small MS4s (MS4 General Permit). As part of the MS4 General Permit authorization, CSH developed and implements a MS4 Program Plan (the Plan) with best management practices (BMPs) to address the six minimum control measures (MCMs) and the special conditions for applicable total maximum daily loads (TMDLs) outlined in the MS4 General Permit. Implementation of these BMPs is consistent with the provisions of an iterative MS4 Program, which constitutes compliance with the standard of reducing pollutants to the "maximum extent practicable" or MEP.

The CSH MS4 program strives to improve environmental compliance, quality, and stewardship through effective management, implementation, and enforcement of sound technical guidelines, criteria, and practices for stormwater management (SWM) and erosion and sediment control (ESC). The plan presented herein demonstrates how CSH's MS4 Program Plan addresses sediment and nutrients (nitrogen and phosphorus) in its MS4 regulated area consistent with the requirements of the Chesapeake Bay TMDL.

1.1 Total Maximum Daily Loads

A TMDL is the total amount of a given pollutant that a waterbody can assimilate and still meet water quality standards. Typically, TMDLs are represented numerically in three main components: Wasteload Allocations (WLAs), Load Allocations (LAs), and a Margin of Safety (MOS). A WLA is the allocated amount of pollutant from areas discharging through a pipe or other conveyance considered a point source. Point sources include sewage treatment plants, industrial facilities, and storm sewer systems. In contrast, a LA is the amount of pollutant from existing non-point sources and natural background such as farm runoff and atmospheric deposition. As a point source discharge, MS4s are assigned a WLA representing the annual loading of the pollutant of concern (POC) that can be discharged from its regulated MS4 area.

1.2 MS4 General Permit Special Conditions

CSH's MS4 General Permit includes a series of special conditions that must be addressed for permit compliance where CSH has been assigned a WLA as part of an approved TMDL. The special conditions state that any TMDL approved by the State Water Control Board (SWCB) assigning a WLA to an MS4 must be addressed by the Permittee through the measurable goals of their MS4 Program Plan.

In 1998, large portions of the Chesapeake Bay and its tidal tributaries within Virginia, Maryland, Delaware, and the District of Columbia were identified as not meeting water quality standards and listed as impaired because of excess nitrogen, phosphorus, and sediment. Due to the Chesapeake Bay waters remaining on the impaired waters list, the Environmental Protection Agency (EPA) required that a TMDL be developed, which was issued on December 29, 2010.

1.3 Watershed Implementation Plan and Strategy for MS4s

The Chesapeake Bay TMDL Watershed Implementation Plans (WIPs) are plans that detail how and when the Chesapeake Bay states and the District of Columbia will meet pollutant allocations. In the Phase I and Phase II WIPs for the Chesapeake Bay TMDL, Virginia committed to a phased approach to reducing nutrients and sediment discharging from MS4s. The issuance of the 2013-2018 MS4 General Permit set forth special conditions required by all MS4 General Permit holders within the Chesapeake Bay watershed. In part, the special conditions require the permittee to achieve 5% of the required reductions identified in the Level 2 Scoping Run from existing baseline loads by July 1, 2018. Baseline loads are defined as those occurring as of June 30, 2009, and are determined using loading rates provided in the MS4 General Permit.

1.4 CSH Chesapeake Bay TMDL Action Plan

The CSH Action Plan presented herein provides a review of the current MS4 program, which demonstrates CSH's ability to ensure compliance with the special conditions, and includes the means and methods CSH will use to meet 5.0% of the Level 2 (L2) scoping run reductions by July 1, 2018. This Action Plan was developed to comply with the special conditions of the MS4 General Permit (9VAC25-890-40) and under the advisement of DEQ's Guidance Memo No. 15-2005, which provides background information and procedures to meet the Chesapeake Bay TMDL special condition requirements.

2.0 APPLICABLE OVERVIEW OF CSH'S MS4 PROGRAM

CSH's MS4 General Permit regulates stormwater discharges from areas located within census urbanized areas (CUAs). CSH is located within a CUA, as depicted in Appendix A. CSH's collective efforts, as described in the CSH MS4 Program Plan, result in a significant reduction of pollutants that could potentially be discharged from its regulated MS4. BMPs already included in the CSH Program Plan that address the Chesapeake Bay TMDL POCs, total suspended solids (TSS), total nitrogen (TN), and total phosphorus (TP), are described in the following sections. Each subsection is provided to address the referenced special condition in the MS4 General Permit.

2.1 Current MS4 Program and Existing Legal Authorities

As a non-traditional MS4, CSH does not have the ability to create legal authorities and has not identified any legal authorities necessary to meet the requirements of the special conditions. However, CSH's MS4 Program includes Minimum Control Measures (MCMs) that include policies and procedures consistent the goals of the Chesapeake Bay TMDL. A summary of the applicable MCMs is provided below to address the following special condition:

- ✓ *"A review of the current MS4 program implemented as a requirement of this state permit including a review of the existing legal authorities and the operator's ability to ensure compliance with this special condition."* [Section I(C)(2)(a)(1)]

- *MCM 1 (Public Education and Outreach)* – CSH's MS4 Program contains a Public Education and Outreach Program (PEOP) that identifies the Chesapeake Bay TMDL POCs as a high priority water quality issue. The PEOP is described in Section 3.1, BMP 1.2 of the CSH MS4 Program Plan and includes the distribution of educational materials regarding methods to reduce introduction of the POCs into stormwater runoff.

- *MCM 3 (Illicit Discharge Detection and Elimination)* – CSH's MS4 Program contains an Illicit Discharge Detection and Elimination (IDDE) Program that includes written procedures to detect, identify, and address non-stormwater discharges, including illegal dumping, to the small MS4, with policies and procedures for when and how to use legal authorities. CSH prohibits non-stormwater discharges into the storm sewer system through language provided within the Stormwater/Pollution Prevention Policy for employees. IDDE BMPs are described in Section 3.1, BMPs 3.1-3.5 of the CSH MS4 Program Plan. The IDDE Program is effective at addressing the POCs through staff training, prohibition of illicit discharges, and annual outfall screening.

- *MCM 4 (Construction Site Runoff Control)* – CSH's MS4 Program contains a Construction Site Runoff Control Program that includes mechanisms to ensure compliance and enforcement on regulated construction sites, which CSH relies on DEQ to provide. All plans will be

consistent with the Virginia Erosion and Sediment Control and Stormwater Management Laws and Regulations. CSH relies on DEQ for inspection and enforcement of these requirements, while CSH and the Department of Behavioral Health and Developmental Services (DBHDS) rely upon the General Conditions of the construction contract document developed by the Department of General Services.

The Construction Site Runoff Control Program is especially effective at reducing downstream conveyance of sediment from transitional sources. Section 3.1, BMPs 4.1-4.3 of the CSH MS4 Program Plan describes construction site runoff control BMPs.

- *MCM 5 (Post-Construction Stormwater Management) –* CSH's MS4 Program contains a Post-Construction Stormwater Management (SWM) Program that ensures water quality criteria in the Virginia Stormwater Management Regulations has been achieved on new developments and developments on prior developed land since July 1, 2009. CSH relies on DEQ for implementation of this requirement.

  CSH's post-construction program ensures inspections and maintenance of stormwater management BMPs to maintain functionality. Section 3.1, BMPs 5.1-5.3 of the CSH MS4 Program Plan describes post-construction stormwater management BMPs.

  Implementation of this program addresses the following MS4 General Permit special condition for the Action Plan:

  ✓ *"The means and methods that will be utilized to address discharges into the MS4 from new sources* [*Section I(C)(2)(a)(3)*]

- *MCM 6 (Good Housekeeping) –* CSH's MS4 Program contains a Good Housekeeping/Pollution Prevention Program that includes policies and procedures to ensure that day-to-day operations minimize the exposure of pollutants to rainfall on the property to the MEP. The program is supported with CSH's Pollution Prevention and Good Housekeeping Manual and annual training for applicable staff. CSH also utilizes contract language to ensure appropriate certifications for application of fertilizers per a DEQ-approved Nutrient Management Plan (NMP). Section 3.1, BMPs 6.1-6.4 of the CSH MS4 Program Plan describes pollution prevention and good housekeeping BMPs.

2.2 New or Modified Legal Authorities

Consistent with the MS4 General Permit, CSH uses an iterative approach to ensure it is minimizing the discharge of pollutants through its MS4 to the MEP. The iterative approach is implemented through the annual reporting process with the review of the effectiveness of each MS4 Program Plan BMP. BMPs are modified, as necessary, to increase effectiveness. If new or modified

authorities are identified as part of the annual "measure of effectiveness" as described for each BMP in the CSH MS4 Program Plan annual reporting, they will be reported through the annual report process. The iterative process addresses the following special condition in the MS4 General Permit:

- ✓ *"The identification of any new or modified legal authorities such as ordinances, state and other permits, orders, specific contract language, and inter-jurisdictional agreements implemented or needing to be implemented to meet the requirements of this special condition."* [Section I(C)(2)(a)(2)]

As a non-traditional MS4, CSH does not have the ability to create legal authorities. No new policies and procedures or modifications to existing policies and procedures were identified as necessary to meet the requirements of the special conditions. Means and methods to meet the special conditions are described in Section 4.

3.0 POLLUTANT LOADINGS

The MS4 General Permit requires CSH to estimate the annual loadings and the POC load reductions (5.0% from the L2 Scoping Run). To complete this requirement, CSH determined the amount of pervious and impervious land cover for their regulated property and input the data into the appropriate loading and reduction tables provided in the MS4 General Permit. The methodology to determine sediment and nutrient loadings and the required reductions are described in the following sub-sections.

3.1 Baseline Loading Characterization

Before estimating the loads and required reductions, CSH first evaluated the extent of their regulated MS4 area, including the regulated acres of urban pervious and impervious surface served by its MS4 as of June 30, 2009. These evaluations were conducted using Geographic Information System (GIS) by digitizing land cover features from aerial photography, as depicted in Appendix A.

CSH's MS4 regulated area was determined using the CSH property boundary as a conservative estimate of the area the MS4 serves. The CSH property boundary was obtained from Dinwiddie County's GIS parcel data. Aerial photography was obtained from the 2009 Virginia Base Mapping Program Orthophotography Aerials[1]. The extent of pervious, impervious, and forested areas were digitized based on the aerial imagery and best professional judgment. Baseline land cover results are provided in Table 1. The determination of regulated area was based on 2000 and 2010 CUA.

Table 1: Classification of CSH Property Land Cover Area (Acres)

Land Cover	CSH Property
Impervious	69.49
Pervious	171.59
Forest*	271.35
Surface Water*	4.15

* Consistent with methodology described in the DEQ Chesapeake Bay Guidance, these areas are not included in the loading computations described in Section 3.2.

3.2 Annual Loadings from Existing Sources

The data summarized in Table 1 were used to estimate pollutant loads from existing sources as of June 30, 2009, using the James River Basin calculation sheet for estimating existing source

[1] The Virginia Base Mapping Program Orthophotography, 2009. https://www.vita.virginia.gov/isp/default.aspx?id=12118

loads provided in the MS4 General Permit. The calculation sheet was completed for the regulated CSH property as provided in Table 2, which addresses the following special condition:

- ✓ *"An estimate of the annual POC loads discharged from the existing sources as of June 30, 2009, based on the 2009 progress run. The operator shall utilize the applicable versions of Tables … based on the river basin to which the MS4 discharges by multiplying the total existing acres served by the MS4 on June 30, 2009, and the 2009 Edge of Stream (EOS) loading rate."* [*Section I(C)(2)(a)(4)*]

Table 2: Loadings from the CSH Property

Pollutant	Regulated Urban Land Cover	Total Existing Acres Served by MS4 (06/30/09)	2009 EOS Loading Rate (lbs/acre)	Estimated Total POC Load Based on 2009 Progress Run (lbs)	Total Load (lbs)
Nitrogen	Impervious	69.49	9.39	652.51	1,851.92
	Pervious	171.59	6.99	1,199.41	
Phosphorus	Impervious	69.49	1.76	122.30	208.10
	Pervious	171.59	0.50	85.80	
TSS	Impervious	69.49	676.94	47,040.56	64,384.88
	Pervious	171.59	101.08	17,344.32	

3.3 Annual Loadings from New Sources and Grandfathered Projects

In addition to computing baseline loadings from existing conditions as of June 30, 2009, the special conditions require the determination of offsets for increased loads from development occurring on or after July 1, 2009, including grandfathered projects. No offsets are necessary for new sources since:

- Loadings from new sources are addressed with the water quality criteria in the SWM regulations. Water quality criteria for new sources from regulated development between July 1, 2009 and June 30, 2014 was based on an average land cover condition of 16% and therefore appropriate offsets were incorporated within the development project's SWM plan.
- No CSH projects are grandfathered.

Since no offsets for new sources are necessary, the following special conditions are addressed:

- ✓ *"A list of future projects and associated acreage that qualify as grandfathered in accordance with 9VAC25-870-48"* [*Section I(C)(2)(a)(10)*]
- ✓ *"The means and methods to offset the increased loads from new sources initiating construction between July 1, 2009, and June 30, 2014, that disturb one acre or greater as a result of the utilization of an average land cover condition greater than 16% impervious cover for the design of post-development stormwater management facilities. The operator shall offset 5.0% of the calculated increased load from these new sources during the permit cycle."* [Section I(C)(2)(a)(7)]
- ✓ *"The means and methods to offset the increased loads from projects as grandfathered in accordance with 9VAC25-870-48, that disturb one acre or greater that begin construction after*

July 1, 2014, where the project utilizes an average land cover condition greater than 16% impervious cover in the design of post-development stormwater management facilities." [Section I(C)(2)(a)(8)]

- ✓ *"Implementation of the means and methods to address discharges from new sources in accordance with the minimum control measure in Section II … related to post-construction stormwater management in new development and development of prior developed lands and in order to offset 5.0% of the total increase in POC loads between July 1, 2009, and June 30, 2014. Increases in the POC load from grandfathered projects initiating construction after July 1, 2014, must be offset prior to completion of the project."* [Section I(C)(3)(c)]

3.4 Required Load Reductions

The MS4 General Permit requires CSH to achieve 5.0% of the L2 Scoping Run POC reductions for existing sources as of June 30, 2009. The required load reductions for the CSH property for this permit cycle were calculated using the calculation sheet in the MS4 General Permit for determining POC reductions for the James River basin. The calculation sheet was modified with the corrected loading rates provided in DEQ's Guidance Memo No. 15-2005. The required load reductions for CSH are depicted in Table 3. The information in the table addresses the following special condition to provide:

- ✓ *"A determination of the total pollutant load reductions necessary to reduce the annual POC loads from existing sources utilizing the applicable versions of Tables … based on the river basin to which the MS4 discharges. This shall be calculated by multiplying the total existing acres served by the MS4 by the first permit cycle required reduction in loading rate. For the purposes of this determination, the operator shall utilize those existing acres identified by the 2000 U.S. Census Bureau urbanized area and served by the MS4."* [*Section I(C)(2)(a)(5)*]

Table 3: Estimated POC Reductions Required from the CSH Property

Pollutant	Regulated Urban Land Cover	Existing Acres Served by MS4 (06/30/09)	Reduction in Loading Rate (lbs/acre)	Reduction Required First Permit Cycle (lbs)	Total Reduction (lbs)
Nitrogen	Impervious	69.49	0.042255	2.94	6.54
	Pervious	171.59	0.02097	3.60	
Phosphorus	Impervious	69.49	0.01408	0.98	1.29
	Pervious	171.59	0.0018125	0.31	
TSS	Impervious	69.49	6.7694	470.41	546.29
	Pervious	171.59	0.442225	75.88	

4.0 MEANS TO ACHIEVE POLLUTANT REDUCTIONS

DEQ's Guidance was used to identify appropriate means and methods for achieving the required reductions calculated in Section 3.4. A review of CSH's existing SWM facilities determined that the required reductions are achieved for the current MS4 General Permit cycle as described in the following sub-sections, addressing the following MS4 General Permit special condition:

- ✓ *"Implementation of means and methods sufficient to meet the required reductions of POC loads from existing sources in accordance with the Chesapeake Bay TMDL Action Plan." [Section I(C)(3)(d)]*

Reduction credits described in the following sub-sections demonstrate compliance with the reduction requirements for this MS4 General Permit cycle with the understanding that any changes in established BMP efficiencies will not be retroactively applied to projects approved to meet reductions for this MS4 General Permit cycle.

4.1 Reductions Achieved with New BMPs

CSH will implement street sweeping in order to satisfy the required POC reductions identified in Section 3.4. The "mass loading approach," as described in the DEQ Guidance, was utilized to determine the extent of street sweeping efforts to be implemented. Per the mass loading approach, the overall weight of material collected through street sweeping is multiplied by a dry weight factor and then a factor specific to each POC in order to quantify the pollutant reductions achieved. Given the target pollutant reductions and the dry weight and POC factors, it was determined that CSH must collect a minimum of 3,737.14 pounds of material per year to meet the POC reduction requirements. Required reductions and sweeping efforts are summarized in Table 4.

Table 4: Required Street Sweeping Material to be Collected per the Mass Loading Approach

Pollutant	Annual Reductions Required by L2 Scoping Run (lbs/yr)	Dry Weight Factor	POC Multiplication Factor	Required Street Sweeping Material Weight (lbs/yr)
Nitrogen	6.54	0.7	.0025	3,737.14
Phosphorus	1.29	0.7	.001	1,842.86
TSS	546.29	0.7	0.3	2,601.38

5.0 IMPLEMENTATION TO THE MEP

Implementation of the Action Plan is dependent on continued execution of the CSH MS4 Program Plan. MS4 Program Plan BMPs will continue to be implemented per the schedules outlined in the CSH MS4 Program Plan to address the following special condition:

- ✓ *"The means and methods, such as management practices and retrofit programs that will be utilized to meet the required reductions included in subdivision 2 a (5) of this subsection … and a schedule to achieve those reductions. The schedule should include annual benchmarks to demonstrate the ongoing progress in meeting those reductions."* [Section I(C)(2)(a)(6)]

The cost associated with the implementation of street sweeping is estimated to be approximately $3,475 per year per pound of phosphorous removed. This estimate is based on the document titled "Cost-Effectiveness Study of Urban Stormwater BMPs in the James River Basin" by the Center for Watershed Protection. The study detailed costs associated with street sweeping based on a ten-year life cycle and the capital cost of a mechanical sweeper. During the current permit cycle, CSH will evaluate the most cost effective way for implementing a street sweeping program which may include contracting street sweeping services or the purchase of a sweeper. This information addresses the following special condition:

- ✓ *"An estimate of the expected costs to implement the requirements of this special condition during the state permit cycle."* [Section I(C)(2)(a)(11)]

5.1 Supplemental Means and Methods

In addition, the remaining Minimum Control Measure BMPs described in Section 2.1 will continue to be implemented by CSH as part of the CSH MS4 Program Plan. Continued implementation of these BMPs demonstrates implementation of the CSH Chesapeake Bay Action Plan to the MEP and demonstrates adequate progress satisfying the following special conditions:

- ✓ *"Implementation of nutrient management plans …"* [Section I(C)(3)(a)]
- ✓ *"Implementation of the minimum control measure related to construction site stormwater runoff control in accordance with this state permit shall address discharges from transitional sources."* [Section I(C)(3)(b)]

5.2 Public Comment Period

CSH will solicit public comment on this Plan and consider all comments that are provided. Opportunities for public comment will be provided through the following means:

- A draft of the Chesapeake Bay TMDL Action plan will be posted on CSH's website for a minimum of 14 days.

- An email will be sent to the target audience identified in Minimum Control Measure 1 of the CSH MS4 Program Plan with a link where comments can be provided on the Action Plan.

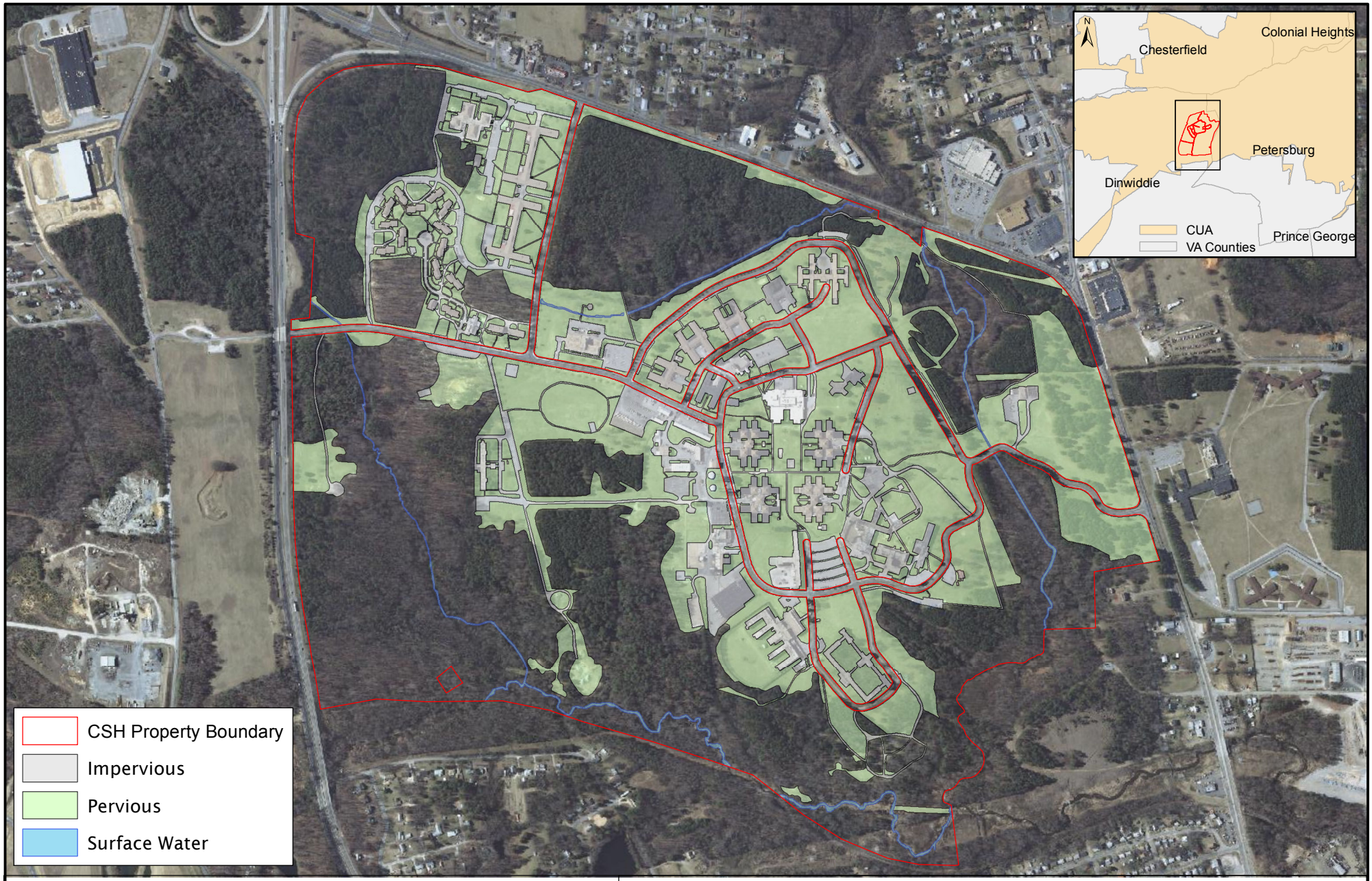
Solicitation of public comment on the Action Plan addresses the following special condition:

- ✓ *"An opportunity for receipt and consideration of public comment regarding the draft Chesapeake Bay TMDL Action Plan."* [Section I(C)(2)(a)(12)]

5.3 Annual Reporting

The effectiveness of the Action Plan will be measured through the MS4 General Permit annual reporting. CSH will report annually on the implementation of the means and methods described in Section 4.1 of this Plan.

Appendix A: Mapping for Characterization of CSH Property



3e EEE Consulting, Inc.
Environmental, Engineering and Educational Solutions

CENTRAL STATE HOSPITAL (CSH)
IMPERVIOUS AND PERVIOUS LAND COVER

0 500 1,000 Feet

N

Petersburg, Virginia
Sources: 2009 VBMP Imagery
Prepared by MGM, June 2016

Projection: NAD 1983 StatePlane Virginia South FIPS 4502 Feet

Proj. 16-082