

Best Management Practices Verification Protocols/Standard Operating Procedures Sediment and Stormwater Program Review Division

Maryland Department of the Environment Water Management Administration

At the request of the U.S. Environmental Protection Agency (EPA) at the Chesapeake Bay Program (CBP), Maryland Department of the Environment (MDE) submits the following documentation pertaining to MDE's Best Management Practice (BMP) verification procedures. The relevant standard operating procedures (SOP) listed below are a part of a larger SOP document that addresses all MS4 permit requirements. The below referenced documents are attached.

1. Attachment A—BMP Urban Database: MDE's BMP Urban Database fulfills CBP's requirement to tie removal rates to visual inspections, and maintenance to BMP performance. Per MS4 permit requirements, jurisdictions must submit data via Attachment A, including BMP types, coordinates, drainage areas, as-built dates (verifying construction), first year inspections, and subsequent triennial inspections. If any of this information is missing, the jurisdiction will not receive reduction credits. MDE verifies project location point coordinates in the submitted database. Where the coordinates are missing or found to be inaccurate, the reviewer will match addresses using the County Property View database and on-line street maps, whose geo-codes are then appended to the addresses. This information is required on a yearly basis (as part of jurisdictions' annual reports), allowing MDE to frequently review BMP implementation, maintenance trends, and deficiencies in each jurisdiction. This information can then be used to prioritize field reviews and on-site BMP verifications. MDE is close to finishing a geodatabase that will replace Attachment A. Jurisdictions will be required to submit data in this new GIS format, which will result in more consistent and higher quality data. MDE will be able to analyze jurisdictions' data spatially, and run standardized reports that will improve MDE's evaluation.
2. Annual Report SOP: The State utilizes the existing MS4 framework by requiring jurisdictions to submit annual reports and data as MS4 permit conditions. The Annual Report SOP serves as an example of how MDE reviews jurisdiction records for completeness, ensuring proper BMP crediting.
3. Stormwater SOP: These procedures fulfill the EPA's request for the State to spot check BMPs through either maintenance records or joint field inspections. The State is required to conduct triennial reviews of Phase Is' stormwater programs in order to assess the jurisdictions' implementation of BMPs for both new development and redevelopment. This fulfills verification of BMPs within a single permit term.

MDE ensures that jurisdictions are adequately approving appropriate BMPs, following the guidance in Table B-13 of *Appendix B: Chesapeake Bay Program Urban Stormwater Workgroup's BMP Verification Guidance*. MDE spot checks plans (i.e., conducts engineering reviews); meets with the plan approval authority to discuss performance bonds, final inspections, and as-built data; and meets with inspectors to discuss maintenance agreements, local BMP databases/tracking, and maintenance inspections. MDE inspects a sample of BMPs in the field to confirm the documentation provided by the jurisdictions. The SOP includes a checklist of important jurisdiction performance criteria and standard forms to assess the quality of jurisdictions' plan reviews and the actual conditions of a sample of BMPs.

4. Erosion and Sediment Control (E&SC) SOP: E&SC BMPs are verified as part of the State's delegation review process. Delegation involves reviewing inspection records and conducting field verifications of control measures. MDE includes the Soil Conservation District in these reviews, providing the opportunity to discuss any problems with approved E&SC plans. These reviews are conducted at most every two years, resulting in BMP verification at least twice per permit term. E&SC site logs provide documentation of MDE's site visits and the conditions of the on-site BMPs. A standardized checklist is used to ensure consistency and completeness of each construction site inspection.
5. Restoration Plans and Total Maximum Daily Loads SOP: In the first year annual report, jurisdictions are required to submit restoration plans that include a list of BMPs, implementation schedules, and benchmarks. This initial reporting will facilitate MDE's evaluation of permit compliance, actual BMP implementation, and progress toward meeting stormwater wasteload allocations. The field inspection as outlined in the SOP addresses EPA's request for restoration verification. MDE visits a representative selection of restoration projects at least once per permit term.
6. Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated: MDE's accounting guidance incorporates CBP's recommendations for nutrient and sediment load credits associated with BMP implementation. Credits are provided if restoration activities and reporting are consistent with CBP's approved practices and efficiencies. The guidance describes how to apply pollutant removal credits for BMP implementation for new development, redevelopment, and restoration; lists the approved BMPs that can be used for credit; and discusses reporting requirements. This document is periodically updated to reflect new BMPs approved by CBP Expert Panels. Complete BMP data are required to receive credit, and will provide information needed for MDE to conduct on-site verifications. The executive summary is attached. The full document can be found at <http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram/Documents/NPDES%20MS4%20Guidance%20August%2018%202014.pdf>.

Attachment A Annual Report Databases

As part of the NPDES annual reporting process, permittees are required to complete databases for storm drain systems, urban best management practices, impervious surfaces, watershed restoration, monitoring site locations, chemical monitoring, pollutant load reductions, biological monitoring, illicit discharge detection, erosion and sediment control responsible personnel training, quarterly grading permit summaries, and fiscal analyses. For compatibility purposes, databases should be submitted in Access or Excel. Any file in a format other than Access or Excel is to be submitted in a “*.dbf” format. Examples of databases and definitions for each category are provided below. If there are any questions regarding the compatibility of databases, please contact the Water Management Administration’s Sediment, Stormwater, and Dam Safety Program at (410) 537-3543.

MDE is utilizing Environmental System Research Institute (ESRI) Arc Geographic Information System (ArcGIS) technologies to track and update all collected datasets and integrate them spatially. GIS datasets shall be submitted in an ESRI Geodatabase or shapefile format, (i.e., “*.shp”). All datasets shall conform to the Maryland State Geographic Information Committee standard – North American Datum (NAD), 1983 Maryland State Plane Coordinate System in “meter” units. Location information collected by global positioning systems (GPS) for the purposes of populating the GIS datasets shall be accurate to the sub-meter (+/- 1 meter) level for acceptable mapping. Additionally, each table below requires a “unique identifier” which is necessary for linking GIS mapping locations to datasets with further descriptions (i.e., outfall dimensions, BMP type, chemical results, etc.).

A. Storm Drain System Mapping Associated with GIS Coverage (PART IV.C.1.)

Column Name	Data Type	Length	Description
YEAR	NUMBER	4	Annual report year
OUTFALL_ID	TEXT	15	Unique outfall ID
MD_NORTH	NUMBER	8	Maryland grid coordinate (NAD 83 meters) Northing
MD_EAST	NUMBER	8	Maryland grid coordinate (NAD 83 meters) Easting
DIM_OUTFL	NUMBER	3	Outfall Dimensions in inches
WATERSHED_CODE	NUMBER	20	Maryland 8 or 12-digit hydrologic unit code
TYPE_OUTFL	TEXT	3	Outfall Type (RCP,CMP, PVC)
DRAIN_AREA	NUMBER	8	Drainage area to outfall (acres) ¹
LAND_USE	NUMBER	3	Predominant land use ²

¹ GIS shapefile required

² Use attached Maryland Office of Planning land use codes.

B. Urban Best Management Practices (BMPs) Associated with GIS Coverage (PART IV.C.3.)

Column Name	Data Type	Length	Description
YEAR	NUMBER	4	Annual report year
STRU_ID	TEXT	8	Unique structure ID ⁵
PERMIT_NO	TEXT	10	Unique permit number
STRU_NAME	TEXT	60	Structure name
ADDRESS	TEXT	50	Structure address
CITY	TEXT	15	Structure address
STATE	TEXT	2	Structure address
ZIP	NUMBER	10	Structure address
MD_NORTH	NUMBER	8	Maryland grid coordinate (NAD 83 meters) Northing
MD_EAST	NUMBER	8	Maryland grid coordinate (NAD 83 meters) Easting
ADC_MAP	TEXT	5	ADC map book coordinate (optional if BMP has MD Northing/Easting)
WATERSHED_CODE	NUMBER	20	Maryland 8 or 12-digit hydrologic unit code

STRU_TYPE	TEXT	10	Identify structure or BMP type ³
LAND_USE	NUMBER	3	Predominant land use ²
CON_PURPOSE	TEXT	4	New development (NEWD), Redevelopment (REDE), or Restoration (REST)
DRAIN_AREA	NUMBER	8	Structure drainage area (acres) ¹
IMP_ACRES	NUMBER	8	Structure impervious drainage area (acres) ¹
TOT_DRAIN	NUMBER	8	Total site area (acres)
WQ_VOLUME	NUMBER	8	Volume of rainfall depth in inches managed by the practice
RCN	NUMBER	5	Runoff curve number (weighted)
ON_OFF_SITE	TEXT	3	On or offsite structure
APPR_DATE	DATE/TIME	8	Permit approval date
BUILT_DATE	DATE/TIME	8	Construction completion date
INSP_DATE	DATE/TIME	8	Record most recent inspection date
GEN_COMNT	TEXT	60	General comments
LAST_CHANGE	DATE/TIME	8	Date last change made to this record

¹ GIS shapefile required

² Use attached Maryland Office of Planning land use codes

³ Use attached urban BMP type code

⁵ Use attached unique structure identification codes

C. Impervious Surfaces Associated with GIS Coverage (PART IV.C.4.)

Column Name	Data Type	Length	Description
YEAR	NUMBER	4	Annual report year
WATERSHED_CODE	NUMBER	20	Maryland 8 or 12-digit hydrologic unit code
IMP_ACREAGE	NUMBER	8	Total impervious acreage in watershed ¹
IMP_CONTROLLED	NUMBER	8	Impervious acreage controlled to the maximum extent practicable ¹
IMP_BASELINE	NUMBER	8	Impervious acreage not controlled to the maximum extent practicable ^{1,2}
RESTORATION_P	NUMBER	8	Impervious acreage proposed for watershed restoration ¹
RESTORATION_UC	NUMBER	8	Impervious acreage under construction for watershed restoration ¹
RESTORATION_C	NUMBER	8	Impervious acreage completed (since program inception) ¹

¹ GIS shapefile required

² Fixed baseline based on MDE Guidance and approval

D. Water Quality Improvement Project Locations Associated with GIS Coverage (PART IV.C.6.)

Column Name	Data Type	Length	Description
YEAR	NUMBER	4	Annual report year
STRU_ID	TEXT	8	Unique structure ID ⁵
STRU_NAME	TEXT	60	Structure name
MD_NORTH	NUMBER	8	Maryland grid coordinate (NAD 83 meters) Northing
MD_EAST	NUMBER	8	Maryland grid coordinate (NAD 83 meters) Easting
WATERSHED_CODE	NUMBER	20	Maryland 8 or 12-digit hydrologic unit code
STRU_TYPE	TEXT	10	Identify structure or BMP type ³
LAND_USE	NUMBER	3	Predominant land use ²
DRAIN_AREA	NUMBER	8	Structure drainage area (acres) ¹
IMP_ACRES	NUMBER	8	Structure impervious drainage area (acres) ¹
WQ_VOLUME	NUMBER	8	Volume of rainfall depth in inches managed by the practice
LINEAR_FT	NUMBER	8	Use this field for stream restoration or shoreline protection
POUNDS_TN	NUMBER	8	Use this field for street sweeping or inlet cleaning
POUNDS_TP	NUMBER	8	Use this field for street sweeping or inlet cleaning
POUNDS_TSS	NUMBER	8	Use this field for street sweeping or inlet cleaning
APPR_DATE	DATE/TIME	8	Permit approval date
BUILT_DATE	DATE/TIME	8	Construction completion date
INSP_DATE	DATE/TIME	8	Record most recent inspection date
GEN_COMNT	TEXT	60	General comments

LAST_CHANGE	DATE/TIME	8	Date last change made to this record
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¹ GIS shapefile required

² Use attached Maryland Office of Planning land use codes

³ Use attached urban BMP type code

⁵ Use attached unique structure identification codes

E. Monitoring Site Locations Associated with GIS Coverage (PART IV.C.5.)

Column Name	Data Type	Length	Description
YEAR	NUMBER	4	Annual report year
STATION	TEXT	30	Unique station ID
OUTFALL_OR_INSTREAM	TEXT	10	Outfall or instream station
WATERSHED_CODE	NUMBER	20	Maryland 8 or 12-digit hydrologic unit code
MD_NORTH	NUMBER	8	Maryland grid coordinate (NAD 83 meters) Northing
MD_EAST	NUMBER	8	Maryland grid coordinate (NAD 83 meters) Easting
DRAIN_AREA	NUMBER	8	Drainage area in acres ¹

¹ GIS shapefile required

E.1. Monitoring Site Locations - Use for Multiple Land Use Values in the Drainage Area

Column Name	Data Type	Length	Description
YEAR	NUMBER	4	Annual report year
STATION	TEXT	30	Name of station (associated with unique station ID in section E.)
LAND_USE_RANK	NUMBER	8	Ranking of land use from predominant to least
LAND_USE	NUMBER	3	Identify land use ²
DRAIN_AREA	NUMBER	8	Drainage area in acres ¹

¹ GIS shapefile required

² Use attached Maryland Office of Planning land use codes

E.2. Monitoring Site Locations - Use for Multiple Stormwater BMPs in the Drainage Area

Column Name	Data Type	Length	Description
YEAR	NUMBER	4	Annual report year
STATION	TEXT	30	Name of station (associated with unique station ID in section E.)
BMP_RANK	NUMBER	5	Ranking of BMPs from predominant to least
STRU_TYPE	TEXT	10	Identify structure or BMP type ³
BMP_DESCRIPTION	TEXT	60	Brief description of BMP
DRAIN_AREA	NUMBER	8	Drainage area in acres treated by BMP ¹

¹ GIS shapefile required

³ Use attached urban BMP type code.

F. Chemical Monitoring (PART IV.F.1.)

Column Name	Data Type	Length	Description
JURISDICTION	TEXT	50	Monitoring jurisdiction name
EVENT_DATE	DATE/TIME	8	Date of storm event
EVENT_TIME	DATE/TIME	8	Time monitoring begins
STATION	TEXT	30	Station name (associated w/ unique station ID in section E.)
OUTFALL_OR_INSTREAM	TEXT	10	Outfall or instream station
STORM_OR_BASEFLOW	TEXT	10	Storm or base flow sample
DEPTH	NUMBER	5	Depth of rain in inches
DURATION	NUMBER	5	Duration of event in hours and minutes
INTENSITY	NUMBER	5	Intensity = depth/duration
TOTAL_STORM_FLOW_VOLUME	NUMBER	5	Total storm flow volume in gallons

WATER_TEMP	NUMBER	5	Flow weighted average of water temperature (Fahrenheit)
pH	NUMBER	5	Flow weighted average of pH
BOD_dt	NUMBER	5	Biological Oxygen Demand detection limit used in analysis
BOD EMC0	NUMBER	5	EMC for Biological Oxygen Demand in mg/l using (0)*
BOD EMC_dt	NUMBER	5	EMC for Biological Oxygen Demand in mg/l using (dt)**
TKN_dt	NUMBER	5	Total Kjeldahl Nitrogen detection limit used in analysis
TKN EMC0	NUMBER	5	EMC for Total Kjeldahl Nitrogen in mg/l using (0)*
TKN EMC_dt	NUMBER	5	EMC for Total Kjeldahl Nitrogen in mg/l using (dt)**
NITRATE+NITRITE_dt	NUMBER	5	Record Nitrate + Nitrite detection limit used in analysis
NITRATE+NITRITE EMC0	NUMBER	5	Enter EMC for Nitrate + Nitrite in mg/l using (0)*
NITRATE EMC_dt	NUMBER	5	Enter EMC for Nitrate + Nitrite in mg/l using (dt)**
TOTAL_PHOSPHORUS_dt	NUMBER	5	Record Total Phosphorus detection limit used in analysis
TOTAL_PHOSPHORUS EMC0	NUMBER	5	Enter EMC for Total Phosphorus in mg/l using (0)*
TOTAL_PHOSPHORUSEMC_dt	NUMBER	5	Enter EMC for Total Phosphorus in mg/l using (dt)**
TSS_dt	NUMBER	5	Total Suspended Solids detection limit used in analysis
TSS EMC0	NUMBER	5	EMC for Total Suspended Solids in mg/l using (0)*
TSS EMC_dt	NUMBER	5	EMC for Total Suspended Solids in mg/l using (dt)**
TOTAL_COPPER_dt	NUMBER	5	Record Total Copper detection limit used in analysis
TOTAL_COPPER EMC0	NUMBER	5	Enter EMC for Total Copper in ug/l using (0)*
TOTAL_COPPER EMC_dt	NUMBER	5	Enter EMC for Total Copper in ug/l using (dt)**
TOTAL_LEAD_dt	NUMBER	5	Record Total Lead detection limit used in analysis
TOTAL_LEAD EMC0	NUMBER	5	Enter EMC for Total Lead in ug/l using (0)*
TOTAL_LEAD EMC_dt	NUMBER	5	Enter EMC for Total Lead in ug/l using (dt)**
TOTAL_ZINC_dt	NUMBER	5	Record Total Zinc detection limit used in analysis
TOTAL_ZINC EMC0	NUMBER	5	Enter EMC for Total Zinc in ug/l using (0)*
TOTAL_ZINC EMC_dt	NUMBER	5	Enter EMC for Total Zinc in ug/l using (dt)**
HARDNESS_dt	NUMBER	5	Record detection limit used in analysis
HARDNESS EMC0	NUMBER	5	Enter EMC for Hardness in ug/l using (0)*
HARDNESS EMC_dt	NUMBER	5	Enter EMC for Hardness in ug/l using (dt)**
TPH_dt	NUMBER	5	Record detection limit used in analysis
TPH EMC0	NUMBER	5	EMC for Total Petroleum Hydrocarbons in mg/l using (0)*
TPH EMC_dt	NUMBER	5	EMC for Total Petroleum Hydrocarbon in mg/l using (dt)**
ENTEROCOCCI_dt	NUMBER	5	Record detection limit used in analysis
ENTEROCOCCI EMC0	NUMBER	5	EMC for enterococci in MPN/100 using (0)*
ENTEROCOCCI EMC_dt	NUMBER	5	EMC for enterococci in MPN/100 using (dt)**
ECOLI_dt	NUMBER	5	Record E. Coli detection limit used in analysis
ECOLI EMC0	NUMBER	5	Enter EMC for E. Coli in MPN/100ml using (0)*
ECOLI EMC_dt	NUMBER	5	Enter EMC for E. Coli in MPN/100ml using (dt)**
LOCAL_CONCERN1_dt	NUMBER	5	Record detection limit used in analysis
LOCAL_CONCERN1 EMC0	NUMBER	5	Enter EMC for in mg/l using (0)*
LOCAL_CONCERN1 EMC_dt	NUMBER	5	Enter EMC for in mg/l using (dt)**
LOCAL_CONCERN2_dt	NUMBER	5	Record detection limit used in analysis
LOCAL_CONCERN2 EMC0	NUMBER	5	Enter EMC for in mg/l using (0)*
LOCAL_CONCERN2 EMC_dt	NUMBER	5	Enter EMC for in mg/l using (dt)**
LOCAL_CONCERN3_dt	NUMBER	5	Record detection limit used in analysis
LOCAL_CONCERN3 EMC0	NUMBER	5	Enter EMC for in mg/l using (0)*
LOCAL_CONCERN3 EMC_dt	NUMBER	5	Enter EMC for in mg/l using (dt)**
GEN_COMNT	TEXT	50	Monitoring comments/documentation

key: **mg/l** = milligrams per liter **ug/l** = micrograms per liter **MPN** = most probable number per 100 milliliters

* **EMC (0)** = Flow weighted averages for three discrete samples representative of a storm using zero (0) for any discrete samples recorded less than the detection limit.

**** EMC (dt)** = Flow weighted averages for three discrete samples representative of a storm using the detection limit value (dt) for any discrete samples recorded less than the detection limit.

G. Pollutant Load Reductions Associated with GIS Coverage (PART IV.E.4. and IV.F.1.)

Column Name	Data Type	Length	Description
YEAR	NUMBER	4	Annual report year
WATERSHED_CODE	NUMBER	20	Maryland 8 or 12-digit hydrologic unit code
TN_RUNOFF	NUMBER	10	(TKN) + (Nitrate + Nitrite) load before treatment (lbs/year)
TN_CONTROLLED	NUMBER	10	(TKN) + (Nitrate + Nitrite) treated by BMPs (lbs/year)
TP_RUNOFF	NUMBER	10	TP load before treatment (lbs/year)
TP_CONTROLLED	NUMBER	10	TP treated by BMPs (lbs/year)
TSS_RUNOFF	NUMBER	10	TSS load before treatment (lbs/year)
TSS_CONTROLLED	NUMBER	10	TSS treated by BMPs (lbs/year)

G.1. Additional Pollutants - Use for Multiple Pollutant Entries

Column Name	Data Type	Length	Description
YEAR	NUMBER	4	Annual report year
WATERSHED_CODE	NUMBER	20	Maryland 8 or 12-digit hydrologic unit code
POLLUTANT	TEXT	20	Identify additional pollutants for impaired water (TMDLs)
WLA_RUNOFF	NUMBER	10	WLA for an approved TMDL before treatment (lbs/year)
WLA_CONTROLLED	NUMBER	10	Waste load for an approved TMDL treated by BMPs (lbs/year)

H. Biological and Habitat Monitoring (PART IV.F.1.)

Column Name	Data Type	Length	Description
YEAR	NUMBER	4	Annual report year
STATION	TEXT	30	Unique station ID
WATERSHED_CODE	NUMBER	20	Maryland 8 or 12-digit hydrologic unit code
MD_NORTH	NUMBER	8	Maryland grid coordinate (NAD 83 Meters) Northing
MD_EAST	NUMBER	8	Maryland grid coordinate (NAD 83 Meters) Easting
DRAIN_AREA	NUMBER	8	Drainage area in acres
BIBI	NUMBER	4	Benthic index of biological indicators
EMBEDDEDNESS	NUMBER	4	Rapid bioassessment protocol score for embeddedness
EPIFAUNAL	NUMBER	4	Rapid bioassessment protocol score for epifaunal
HABITAT	NUMBER	4	Rapid bioassessment protocol score for habitat
LAND_USE	NUMBER	3	Predominant land use ²

² Use attached Maryland Office of Planning land use codes

I. Illicit Discharge Detection and Elimination (PART IV.D.3.)

Column Name	Data Type	Length	Description
YEAR	NUMBER	4	Annual report year
OUTFALL_ID	TEXT	15	Unique outfall ID used in Section A. database
SCREEN_DATE	DATE/TIME	8	Field screening date
TEST_NUM	NUMBER	5	Initial screening, follow-up test, 3rd, etc.
LAST_RAIN	DATE/TIME	8	Date of last rain > 0.10"
TIME	DATE/TIME	8	Field screening time
OBSERV_FLOW	TEXT	3	Was flow observed? (yes/no)
CFS_FLOW	NUMBER	5	Flow rate in cubic feet per second (CFS)
WATER_TEMP	NUMBER	5	Water temperature (Fahrenheit)
AIR_TEMP	NUMBER	5	Air temperature in (Fahrenheit)
CHEM_TEST	TEXT	3	Was chemical test performed? (yes/no)
pH	NUMBER	5	pH meter reading

PHENOL	NUMBER	5	Milligrams per Liter (mg/l)
CHLORINE	NUMBER	5	mg/l
DETERGENTS	NUMBER	5	mg/l
COPPER	NUMBER	5	mg/l
ALGAEGROW	TEXT	3	Was algae growth observed? (yes/no)
ODOR	TEXT	2	Type of odor ⁴
COLOR	TEXT	2	Discharge color ⁴
CLARITY	TEXT	2	Discharge clarity ⁴
FLOATABLES	TEXT	2	Floatables in discharge ⁴
DEPOSITS	TEXT	2	Deposits in outfall area ⁴
VEG_COND	TEXT	2	Vegetative condition in outfall area ⁴
STRUCT_COND	TEXT	2	Structural condition of outfall ⁴
EROSION	TEXT	2	Erosion in outfall area ⁴
COMPLA_NUM	TEXT	3	Is screening complaint driven? (yes/no)
ILLICIT_Q	TEXT	3	Was illicit discharge found? (yes/no)
ILLICIT_ELIM	TEXT	3	Was illicit discharge eliminated? (yes/no)

⁴Use Attached Pollution Prevention Activities Codes

J. Responsible Personnel Certification Information (PART IV.D.2.)

Column Name	Data Type	Length	Description*
PREFIX	TEXT	2	Mr, Ms
FIRSTNAME	TEXT	15	First name
LASTNAME	TEXT	15	Last name
ADDRESS	TEXT	50	Full address
CITY	TEXT	15	City
STATE	TEXT	2	State
ZIP	NUMBER	10	Zip code
DATE	DATE/TIME	8	Date of class
PHONE	NUMBER	10	Phone number
CERT_NUM	NUMBER	6	Certification number as provided by MDE
COMPANY	TEXT	30	Employer
INSTRUCTOR	TEXT	20	Instructor's last name

* Do not use all caps

K. Quarterly Grading Permit Information Associated with GIS Coverage (PART IV.D.2.)

Column Name	Data Type	Length	Description
SITE_NAME	TEXT	60	Construction site name
SITE_OWNER	TEXT	60	Construction site owner
OWNER_ADDRESS	TEXT	50	Owner address
OWNER_CITY	TEXT	15	Owner address
OWNER_ZIP	NUMBER	10	Owner zip code
SITE_ADDRESS	TEXT	50	Site address
SITE_CITY	TEXT	15	Site address
SITE_ZIP	NUMBER	10	Site zip code
MD_NORTH	NUMBER	8	Maryland grid coordinate (NAD 83 meters) – site
MD_EAST	NUMBER	8	Maryland grid coordinate (NAD 83 meters) – site
WATERSHED_CODE	NUMBER	20	Maryland 8 or 12-digit hydrologic unit code
DIST_AREA	NUMBER	8	Disturbed area of site in acres ¹
GRAD_PERMIT	TEXT	50	Local grading permit number
APPR_DATE	DATE/TIME	8	Grading Permit approval date
LAND_USE	NUMBER	3	Predominant land use ² (built)

¹ GIS shapefile required

² Use attached Maryland Office of Planning land use codes

L. Fiscal Analyses (PART IV.G.)

Permit Condition	Data Type	Length	Description
YEAR	NUMBER	4	Annual report year
LEGAL_AUTH	NUMBER	13	Total annual cost for legal authority
SOURCE_ID	NUMBER	13	Total annual cost for source ID
SW_MANAGEMENT	NUMBER	13	Total annual cost for stormwater management
EROS_SED_CON	NUMBER	13	Total annual cost for erosion and sediment
ILLICIT_DET/ELIM	NUMBER	13	Total annual cost for illicit det/elimination
TRASH_ELIM	NUMBER	13	Total annual cost for trash elimination
PROP_MANAGEMENT	NUMBER	13	Total annual cost for property management
INLET_CLEAN	NUMBER	13	Total annual cost for inlet cleaning
STRT_SWEEP	NUMBER	13	Total annual cost for street sweeping
RD_MAINT_OTHER	NUMBER	13	Total annual cost for road maintenance - other
PUB_EDUCATION	NUMBER	13	Total annual cost for public education
WATERSHED_ASSESS	NUMBER	13	Total annual cost for watershed assessment
WATERSHED_RESTOR	NUMBER	13	Total annual cost for watershed restoration
CHEM_MON_ASSESS	NUMBER	13	Total annual cost for chemical monitoring
BIO_MON_ASSESS	NUMBER	13	Total annual cost for biological monitoring
PHYS_STRM_ASSESS	NUMBER	13	Total annual cost for physical assessment
MANUAL_MON	NUMBER	13	Total annual cost for design manual monitorin
TMDL_ASSESS	NUMBER	13	Total annual cost for tmdl assessment
TOTAL_NPDES_FUNDS	NUMBER	13	Total annual cost for total npdes program

²MDP Land Use/Land Cover

10 Urban Built-up

- **11 Low Density Residential** – Detached single family/duplex dwelling units, yards, and associated areas. Areas of more than 90 percent single family/duplex dwelling units, with lot sizes less than five acres but at least one-half acres (.2 dwelling units/acre to 2 dwelling units/acre).
- **12 Medium Density Residential** – Detached single family/duplex, attached single unit row housing, yards, and associated areas. Areas of more than 90 percent single family/duplex units and attached single unit row housing, with lot sizes of less than one-half acre but at least one-eighth acre (2 dwelling units/acre to 8 dwelling units/acre).
- **13 High Density Residential** – Attached single unit row housing, garden apartments, high rise apartments/condominiums, mobile home and trailer parks. Areas of more than 90 percent high density residential units, with more than 8 dwelling units/acre.
- **14 Commercial** – Retail and wholesale services. Areas used primarily for the sale of products and services, including associated yards and parking areas.
- **15 Industrial** – Manufacturing and industrial parks, including associated warehouses, storage yards, research laboratories, and parking areas.
- **16 Institutional** – Elementary and secondary schools, middle schools, junior and senior high schools, public and private colleges and universities, military installations (built-up areas only, including buildings and storage, training, and similar areas) churches and health facilities, correctional facilities, and government offices and facilities that are clearly separable from the surrounding land cover.
- **17 Extractive** – Surface mining operations, including sand and gravel pits, quarries, coal surface mines, and deep coal mines. Status of activity (active vs. abandoned) is not distinguished.
- **18 Open Urban Land** – Urban areas whose use does not require structures, or urban areas where non-conforming uses characterized by open land have become isolated. Included are golf courses, parks, recreation areas (except associated with schools or other institutions), cemeteries, and entrapped agricultural and undeveloped land within urban areas.
- **191 Large Lot Subdivision (Agriculture)** – Residential subdivisions with lot sizes less than 20 acres but at least 5 acres, with a dominant land cover of open fields or pasture.
- **192 Large Lot Subdivision (Forest)** - Residential subdivisions with lot sizes less than 20 acres but at least 5 acres, with a dominant land cover of deciduous, evergreen or mixed forest.

20 Agriculture

- **21 Cropland** – Field and forage crops.
- **22 Pasture** – Land used for pasture, both permanent and rotated: grass.
- **23 Orchards/Vineyards/Horticulture** – Areas of intensively managed commercial bush and tree crops, including areas used for fruit production, vineyards, sod and seed farms, nurseries, and green houses.

- **24 Feeding Operations** – Cattle or hog feeding lots, poultry houses, and holding lots for animals, and commercial fishing areas (including oyster beds).
- **241 Feeding Operations** – Cattle or hog feeding lots, poultry houses, and holding lots for animals.
- **242 Agricultural Building** – Breeding and training facilities, storage facilities, built-up areas associated with a farmstead, small farm ponds, and commercial fishing areas.
- **25 Row and Garden Crops** – Intensively managed track and vegetable farms and associated areas.

40 Forest

- **41 Deciduous Forest** – Forested areas in which the trees characteristically lose their leaves at the end of the growing season. Included are such species as oak, hickory, aspen, sycamore, birch, yellow poplar, elm, maple, and cypress.
- **42 Evergreen Forest** - Forested areas in which the trees are characterized by persistent foliage throughout the year. Included are such species as white pine, pond pine, hemlock, southern white cedar, and red pine.
- **43 Mixed Forest** – Forested areas in which neither deciduous or evergreen species dominate, but in which there is a combination of both types.
- **44 Brush** – Areas that do not produce timber or other wood products but may have cut-over timber stands, abandoned agriculture fields, or pasture. These areas are characterized by vegetation types such as sumac, vines, rose, brambles, and tree seedlings.

50 Water – Rivers, waterways, reservoirs, ponds, bays, estuaries, and ocean.

60 Wetlands – Forested and non-forested wetlands, including tidal flats, tidal and non-tidal marshes, and upland swamps and wet areas.

70 Barren Land

- **71 Beaches** – Extensive shoreline areas of sand and gravel accumulation, with no vegetative cover or other land use.
- **72 Bare Exposed Rock** – Areas of bedrock exposure, scarps, and other natural accumulations of rock without vegetative cover.

73 Bare Ground – Areas of exposed ground caused naturally, by construction, or other cultural processes.

³ Glossary of Stormwater BMP Structure Types and Practices Reported to MDE

Structural BMPs			
Structure Type	Code	Structure Function	Chesapeake Bay Program Classification
Artificial Wetlands (See Shallow Marsh also)	SM	A structure with a permanent shallow pool planted with wetland vegetation often designed to provide extended detention.	Wet Pond & Wetlands
Attenuation swale or dry swale	SW	Open drainage channel designed to detain and promote the filtration of stormwater runoff through underlying fabricated soil media (see Grassed Swale or SW).	Filtering Practice
Bio-retention	BR	Landscape designed such that stormwater runoff collects in shallow depressions before filtering through fabricated planting soil media .	Filtering Practice
Check Dam	CD	A small dam constructed in a gully or other small waterway to decrease flow velocity (by reducing the channel gradient), minimize scour, & promote deposition of sediment.	Filtering Practice
Detention Structure (Dry Pond)	DP	Designed to store runoff without a permanent pool.	Dry Detention Pond & Hydrodynamic Structure
Dry Well	DW	An infiltration trench variant designed to exclusively accommodate rooftop runoff.	Infiltration Practice
Extended Detention Structure (Two types):	ED	Designed to temporarily detain a portion of runoff for 24 hrs after a storm using a fixed orifice to regulate outflow at a specific rate, allowing solids & associated time to settle out.	Dry Extended Detention Pond
Extended Detention Structure, Dry	EDSD	Designed for the temporary storage of runoff associated with at least a 24 hr 1-year storm without creating a permanent pool of water.	Dry Extended Detention Pond
Extended Detention Structure, Wet	EDSW	Designed for the storage of runoff associated with at least a 24 hr 1-year storm. The detained water drains partially & the remaining portion creates a permanent pool .	Dry Extended Detention Pond or Wet Pond & Wetlands
Filter Strip	FS	Vegetated land designed to intercept sheet flow from upstream development.	Filtering Practice
Flow Splitter	FISp	Hydraulic structure designed either to divert a portion of stream flow to a BMP located away from a channel, direct stormwater to a parallel pipe system or bypass a portion of base flow around a pond .	Not a WQ BMP
Flood Management Area	FLOOD	10 year storm overbank flood protection	Not a WQ BMP
Forebay	FOREBAY	Storage structure adjoining a SWM BMP inlet designed to trap coarse sediments and thereby lessen their accumulation in the main treatment area .	Dry Detention Pond & Hydrodynamic Structure
Gabion	GABION	A large rectangular box made of heavy gauge wire mesh which holds cobbles and boulders for changing stream flow patterns, bank stabilization, and erosion control.	Filtering Practice
Grass Swale	SW	Open vegetated channel used to convey runoff and provide treatment by filtering pollutants and sediment.	Filtering Practice
Hydrodynamic Structure such as 1) Oil grit separator 2) Bay Saver® 3) Stormceptor®	OGS BS SC	An engineered structure used to separate sediments and oils from stormwater runoff using gravitational separation and/or hydraulic flow.	Dry Detention Pond & Hydrodynamic Structure
Infiltration Basin	IB	Designed to allow stormwater to infiltrate into permeable soils. It differs from a retention structure in that it may include a back-up underdrain pipe to ensure eventual removal of standing water.	Infiltration Practice

Infiltration Trench (Three types):	IT	An excavated trench that has been backfilled with exposed or unexposed stones to form an underground reservoir (Also see Dry Well).	Infiltration Practice
Complete Exfiltration	ITCE	Runoff can only exit the trench by exfiltrating through the stone reservoir into the underlying soil	
Partial Exfiltration	ITPE	Runoff exits the trench by exfiltrating a) through the stone reservoir into the underlying soil, and b) via a perforated underdrain at the bottom of the trench that diverts runoff to a central outlet.	
Water Quality Exfiltration	ITWQE	Storage volume is set to receive only the first $\frac{1}{2}$ " of runoff (first flush) from an impervious area of the watershed.	
Landscape	LANDSCAPE	Impervious area reduction (Thus far, only Prince Georges County has submitted reports of this practice).	Filtering Practice
Level Spreader	LS	A device for distributing stormwater uniformly over the ground surface as sheet flow to prevent concentrated, erosive flow and promote infiltration.	Infiltration Practice
Micropool (Reported by various jurisdictions before the standardization of codes)	MP	A smaller permanent pool used in a stormwater pond to mitigate the thermal impacts of a larger pond, impacts on existing wetlands, or compensate for lack of topographic relief.	Wet Pond & Wetlands
Observation well	OBS_WELL	A test well installed in an infiltration trench to monitor draining time after installation.	Not a SWM BMP - Observation Well
Other	OTH	A stormwater facility that is known to have been implemented but whose type cannot definitively be identified at the time of submitting a Notice of Construction Completion report to MDE.	Defaults to Dry Detention Pond & Hydrodynamic Structure, evaluated as the least efficient class of facilities in removing TSS, TN, and TP from stormwater runoff.
Porous Pavement	PP	A porous asphalt surface designed to have bearing strength similar to conventional asphalt but provides a rapid conduit for runoff to reach a subsurface stone reservoir.	Infiltration Practice
Retention Pond (See Wet Pond/WP)	WP	A structure with a permanent pool of water for treating incoming storm runoff.	Wet Pond & Wetlands
Sand Filter	SF	A bed of sand to which the first flush of runoff is diverted. Water leaving the filter is collected in underground pipes & returned to a waterway. A layer of peat, limestone, and/topsoil may be added to improve removal efficiency.	Filtering Practice
Shallow Marsh	SM	A structure with a permanent shallow pool planted with wetland vegetation often designed to provide extended detention.	Wet Pond & Wetlands
Underground Storage	UGS	Vault like structure designed for the temporary storage of storm flow.	Dry Detention Pond & Hydrodynamic Structure
Vegetated Buffer	VB	A vegetated protective zone of variable width located along both sides of a waterway.	Filtering Practice
Water Quality Inlet	OGS	See Hydrodynamic Structure-Oil Grit Separator.	Dry Detention Pond & Hydrodynamic Structure
Wet Pond	WP	A structure with a permanent pool of water for treating incoming storm runoff.	Wet Pond & Wetlands

Environmental Site Design Practices			
Practice Type	Code	Function	Chesapeake Bay Program Classification
<u>Environmental Site Design</u> -- alternative surfaces, non-structural and micro-scale practices may be grouped as a comprehensive stormwater design system and identified singly as ESD.	ESD	A comprehensive design strategy for maintaining predevelopment runoff characteristics and protecting natural resources is available. This strategy relies on integrating site design, natural hydrology, and smaller controls to capture and treat runoff.	Stormwater to the MEP
Alternative Surfaces			
1) Green Roof	ESDGR	Alternative surface used in place of traditional flat or pitched roofs to reduce runoff.	Stormwater to the MEP
2) Permeable Pavements	ESDPERMP	Any of the available materials that are used to replace traditional pavements (e.g., asphalt, concrete) and reduce runoff.	
3) Reinforced Turf	ESDRTRF	Grassed or gravel area with open, load-bearing matrix for structural integrity.	
Nonstructural Practices			
1) Disconnection of Rooftop Runoff	ESDRTD	Rooftop runoff is disconnected and then directed to a pervious area where it either infiltrates or is filtered.	Stormwater to the MEP
2) Disconnection of Non-Rooftop Runoff	ESDNRTD	Runoff from surface impervious areas is disconnected and then directed to a pervious area where it either infiltrates or is filtered. Examples: Overland sheet flow, permeable pavers, rain gardens and small scale filters.	
3) Sheetflow to Conservation Areas	ESDSFNAC	Runoff is discharged to a natural conservation or buffer area (e.g. stream buffers, forest buffers) through overland flow.	
Micro-Scale Practices			
1) Rainwater Harvesting	ESDRH	These practices intercept and store rainfall for future use.	Stormwater to the MEP
2) Submerged Gravel Wetlands	ESDSGW	Small-scale filter using wetland plants and a gravel media to provide treatment.	
3) Landscape Infiltration	ESDIL	Combination of landscape features with infiltration practices.	
4) Infiltration Berms	ESDIB	Series of small berms used in sloped areas to detain, infiltrate, and filter runoff.	
5) Dry Wells	ESDDW	An infiltration trench variant designed to exclusively accommodate rooftop runoff.	
6) Micro-Bioretenention	ESDMB	Small, vegetated filter used to capture and treat runoff from adjacent impervious areas.	
7) Rain Gardens	ESDRG	Shallow landscaped feature used to detain and filter runoff and used primarily in residential applications.	
8) Swales	ESDSW	Channels that provide conveyance, water quality treatment and flow attenuation of runoff. Variants include the grassed swale, bio-swale, and wet swale.	
9) Enhanced Filters	ESDEF	A modification applied to other filters that increase nutrient removal and groundwater recharge.	

Alternative MS4 BMPs			
Practice Type	Code	Description	Chesapeake Bay Program Classification
Mechanical Street Sweeping	MSS	Removes the buildup of pollutants that have been deposited along the street or curb using a mechanical sweeper truck	Street Sweeping, Mechanical
Regenerative/Vacuum Street Sweeping	VSS	Removes the buildup of pollutants that have been deposited along the street or curb using a vacuum-assisted sweeper truck	Street Sweeping, Regenerative
Nutrient Management	NM	Comprehensive nutrient management plan for reducing and or eliminating fertilizer use	Nutrient Management
Grass/Meadow Buffers	GMB	An area of trees at least 35 feet wide on one side of a stream, usually accompanied by infrequently-mowed grass, meadow flora species, and other vegetation that is adjacent to a body of water	Urban Grass/Meadow Buffers
Forest Buffers	FB	An area of trees at least 35 feet wide on one side of a stream, usually accompanied by trees, shrubs, and other vegetation that is adjacent to a body of water	Urban Forest Buffers
Impervious Surface Elimination (to Pervious)	IMPP	Pollutant load reduction expected when land cover is converted from impervious to pervious	Land Cover Change
Impervious Surface Elimination (to Forest)	IMPF	Pollutant load reduction expected when land cover is converted from impervious to forest	Land Cover Change
Planting Trees or Forestation on Pervious Urban	FPU	100 trees per acre or greater is necessary with at least 50% of the trees being 2 inches or greater in diameter at 4 ½ feet above ground level (an aggregate of smaller sites may be used)	Land Cover Change
Catch Basin Cleaning	CBC	Routine cleanouts performed on targeted infrastructure that have high accumulation rates	Street Sweeping
Storm Drain Vacuuming	SDV	Routine vacuuming performed on targeted infrastructure that has high accumulation rates	Street Sweeping
Stream Restoration	STRE	Stream restoration includes re-establishing a stable channel; reconnecting the stream with the floodplain; introducing habitat features such as step-pools, woody debris, or riparian vegetation; and integrating structural approaches such as rock walls or riprap.	Urban Stream Restoration
Shoreline Stabilization	SHST	These practices apply to the shoreline of the Chesapeake and Atlantic Coastal Bays and tidal rivers. Nonstructural practices or living shorelines include tidal marsh creation and beach nourishment; structural practices include stone revetments, breakwaters, or groins.	Shoreline Stabilization
Septic Pumping	SEPP	Implementation of septic system pumping	Septic Pumping
Septic Denitrification	SEPD	Implementation of enhanced denitrification technology	Septic Denitrification
Septic Connections to WWTP	SEPC	Removal of septic system and waste stream connection made to a waste water treatment plant.	Septic Connection to WWTP
Education	EDU	Education	To Be Determined
Sub-Soiling	SUB	Sub-Soiling	To Be Determined
Trash Removal	TRA	Trash Removal	To Be Determined
Pet Waste Management	PET	Pet Waste Management	To Be Determined
Outfall Stabilization	OUTS	Outfall Stabilization	To Be Determined
Floodplain Restoration	FPRES	Floodplain Restoration	To Be Determined
River Bank Stabilization	RBS	River Bank Stabilization	To Be Determined
Bio-Reactor Carbon Filter	BRCF	Bio-Reactor Carbon Filter	To Be Determined
Disconnection of Illicit Discharges	DID	Disconnection of Illicit Discharges	To Be Determined

Alternative MS4 BMPs (Continued)			
Practice Type	Code	Description	Chesapeake Bay Program Classification
Step Pool Storm Conveyance	SPSC	Step Pool Storm Conveyance; if used as a filtration practice, the pollutant removal efficiencies for micro-bioretenention can be applied to the drainage area treated.	To Be Determined

Policy Decision			
Policy	Code	Description	Chesapeake Bay Program Classification
Exemption	EXEMPT	Land development activities that are not subject to the stormwater management requirements.	Not a SWM BMP
Variance	VARIANCE	A modification of the minimum stormwater management requirements if site conditions are such that strict adherence would impose unnecessary.	Not a SWM BMP
Waiver	WAIVER	Exemption from stormwater management requirements granted to an applicant for a specific project based on a review by "the appropriate approval authority."	Not a SWM BMP

⁴**Pollution Prevention Activities Codes**

- 21. ODOR:** None(N), Sewage (SE), Sulfur (S), Oil (IL), Gas (G), Rancid-Sour (RS), Other (O)
- 22. COLOR:** Clear (C), Yellow (Y),Brown (B), Green (GR), Red (R), Gray (G), Other (O)
- 23. CLARITY:** Clear (C), Opaque (OP), Cloudy (CD), Other (O)
- 24. FLOATABLES:** None (N), Oil Sheen (OS), Sewage (SE), Trash (T), Other (O)
- 25. DEPOSITS:** None (N), Sediment (S), Oil (IL), Other (O)
- 26. VEG_COND.:** Normal (N), Excessive Growth (EG), Inhibited Growth (IG), Other (O)
- 27. STRUCT_COND:** Normal (N), Concrete Cracking (CC), Concrete Spalling (SP), Other (O)
- 28. EROSION:** None (N), Moderate (M), Severe (S)

⁵Unique Structure Identification Codes

Each stormwater best management structure or water quality improvement project will need a unique identification code. For management of these data statewide it is necessary that these codes also indicate the jurisdiction where they are implemented. Please use the County, City, or State abbreviations listed below as part of each structures unique identification code.

Anne Arundel County	AA
Baltimore City	BC
Baltimore County	BA
Carroll County	CA
Charles County	CH
Frederick County	FR
Harford County	HA
Howard County	HO
Prince George's County	PG
Montgomery County	MO
Maryland State Highway Administration	SHA

Standard Operating Procedures for Evaluating Compliance with and Enforcement of Maryland's Phase I MS4 Permits

**Water Management Administration
Sediment, Stormwater, and Dam Safety
Program**

March 2015



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I. Introduction

Unlike many National Pollutant Discharge Elimination System (NPDES) permits, municipal separate storm sewer system (MS4) permits do not contain specific end-of-pipe effluent limits based on water quality standards or available treatment technology. Instead, most MS4 permits include programmatic requirements involving the implementation of best management practices (BMPs) to reduce the discharge of pollutants to the maximum extent practicable (MEP). Flexibility is built into the permits to allow permittees to choose the types of BMPs and program activities implemented to meet permit requirements.

The Maryland Department of the Environment (MDE) has developed standard operating procedures (SOPs) for evaluating each major element of an MS4 program. The purpose of this document is to describe in detail each SOP and to provide a framework for conducting comprehensive MS4 program evaluations. MDE may use notes, checklists, and reports developed as a result of these procedures to recommend additional activities to help permittees improve their MS4 programs. In addition, these procedures establish a consistent process for documenting MS4 permit compliance, and any findings can be grounds for enforcement.

Each SOP listed in this document describes a series of evaluations to be used by MDE staff to assess major MS4 program elements. Several of these program elements are predicated on existing Maryland law for erosion and sediment control and stormwater management. In these instances, the Code of Maryland Regulations (COMAR) lists specific criteria for evaluating local erosion and sediment control and stormwater management programs, which these SOPs reinforce. These procedures will also address federal requirements for illicit discharge detection and elimination, restoration plans for total maximum daily loads (TMDLs), property management (i.e., municipal industrial facilities), and assessment of controls (i.e., monitoring).

II. MS4 Evaluation Framework

The term *evaluation* can refer to a screening process, inspection, or full-fledged audit depending on the level of detail involved in the review. According to EPA, a *screening* is an evaluation method used to get a basic impression of a program that may be used as a precursor to an inspection or audit. An *inspection* is a focused evaluation of specific components of an MS4 program to verify compliance with permit requirements. An example of an inspection would be MDE's delegation review of a local authority's erosion and sediment control enforcement program. An audit is a comprehensive evaluation of all components of an MS4 program. The following SOPs call for regular screening of annual reports, inspection of each major program element at least once during a five-year permit term, and a comprehensive audit of each MS4 jurisdiction by the end of its permit term.

III. Standard Operating Procedures

The first of the SOPs describes how to screen a jurisdiction's annual report to gather basic information, flag deficiencies, and prioritize program elements for inspections. The remaining procedures follow the organization of the MS4 permits and include in this order: stormwater

management, erosion and sediment control, illicit discharge detection and elimination, property management, watershed restoration plans and TMDLs, and assessment of controls. The SOPs are organized in a concise chart format (see example below) so that anyone using this document has a clear understanding of what is expected, how programs will be evaluated, and what can trigger violation notices and enforcement actions.

Title:	Major MS4 Program Element	SOP # MS4.X
Administration:	Water Management Administration	Effective Date: January 1, 2015
Program:	Sediment, Stormwater, and Dam Safety Program	Revision Date:
Division:	Program Review Division	Page 1 of 1
Purpose:	Ensure that each MS4 Phase I jurisdiction implements an effective [major MS4 program element]	
References:	Citations of all relevant state and federal codes and regulations	
Overview:	MDE's evaluation of an MS4 jurisdiction consists of...	
Procedures:	<p>1.0 <u>Annual Screening</u>. Conduct a review of annual program implementation data, local ordinances, and procedures to assess the implementation of a jurisdiction's...program.</p> <p>2.0 <u>Field Inspection</u>. At least once every five-year permit term, conduct a field inspection of each jurisdiction's...program in coordination with the local plan review and enforcement authorities.</p> <p>3.0 <u>Documentation</u>. Use the attached checklists to guide an effective annual report screening and field inspection...</p> <p>4.0 <u>Determination</u>. Following the review of an MS4 jurisdiction's stormwater management program, the acceptability of the program must be determined...</p>	
Enforcement:	If the MS4 jurisdiction's major program element is found to be unacceptable, refer to the Enforcement SOP to determine the appropriate course of action.	
Documentation: (attached)	<p>Elements of an Effective Program</p> <p>Table X.1. Annual Screening Checklist</p> <p>Table X.2. Field Inspection Checklist</p> <p>Table X.3. Annual Program Screening and Inspection Log Book</p>	

Filing Procedures:	1.0 Save all checklists, reports, and signed correspondence electronically. 2.0 Save all checklists, reports, and signed correspondence in the SSDS file cabinet room alphabetically by jurisdiction.
Authorized:	Mr. Brian Clevenger, Program Manager Sediment, Stormwater, and Dam Safety Program
Date:	January 1, 2015

A. Annual Reports

Title:	MS4 – Annual Report Screening	SOP # MS4.A
Administration:	Water Management Administration	Effective Date: January 1, 2015
Program:	Sediment, Stormwater, and Dam Safety Program	Revision Date:
Division:	Program Review Division	
Purpose:	Ensure that each Phase I MS4 jurisdiction submits timely annual reports. Provide an initial screening of major permit requirements and prioritize major permit elements for additional inspections.	
References:	CFR (40 subsection 122.42(c)) – Federal requirement to submit MS4 annual reports	
Overview:	MDE’s evaluation of an MS4 jurisdiction’s annual report consists of an initial screening of major permit requirements for stormwater management, erosion and sediment control, illicit discharge detection and elimination, property management, watershed restoration plans and TMDLs, and assessment of controls. Annual report screenings will document an initial compliance assessment of a jurisdiction’s annual report and prioritize specific program elements for on-site (field) inspections.	
Procedures:	<p>1.0 <u>Annual Screening</u>. Conduct an annual screening of an MS4 jurisdiction’s annual report of all major program elements. This screening includes:</p> <p>1.01 Calling the jurisdiction’s contact person one month before the permit’s anniversary date to remind her or him of the jurisdiction’s annual report obligations and to get an initial status of the document.</p> <p>1.02 Corresponding with the jurisdiction to acknowledge the annual report receipt date (refer to paragraph 3.0);</p> <p>1.03 Placing the annual report and associated data on the Water Management Administration’s (WMA’s) drive shared with MDE’s Science Services Administration (SSA) within one week of receiving the annual report. Notify by email the appropriate SSA contact informing him or her that the annual report and data have been submitted. Include a link to the WMA/SSA shared folder in which the files are saved so that SSA can provide technical review of the following:</p> <p style="padding-left: 40px;">A. Urban BMP reporting for Chesapeake Bay TMDLs; and</p> <p style="padding-left: 40px;">B. Implementation plans for approved stormwater WLAs.</p> <p>1.04 Using the established SOPs for each major MS4 program element to</p>	

	<p>screen:</p> <ul style="list-style-type: none"> A. Stormwater management (SOP # MS4.B); B. Erosion and sediment control (SOP # MS4.C); C. Illicit discharge detection and elimination (SOP # MS4.D); D. Property management and maintenance (SOP # MS4.E); E. Restoration plans and TMDLs (SOP # MS4.F); and F. Assessment of controls (SOP # MS4.G). <p>1.05 Reporting MS4 program operating and capital expenditures;</p> <p>1.06 Incorporating SSA's review of TMDLs, stormwater WLAs, and the urban BMP database into MDE's annual report screening; and</p> <p>1.07 Prioritizing on-site inspections based on completeness of each major program element, and following the appropriate SOP to conduct each program element's field inspection.</p> <p>2.0 <u>Documentation</u>. Use the attached documentation checklists to guide an effective annual report screening. Use the attached observation chart as a template for MDE's observations to be provided to the jurisdiction. Complete the MS4 annual report permit log book to keep record of annual report submittals, review letters and dates, baseline and restored acres, fiscal data, and each jurisdiction's annual report status.</p> <p>3.0 <u>Determination</u>. Following the screening of an MS4 jurisdiction's annual report, the completeness and acceptability of submittals must be determined. Within two months of annual report receipt, write a formal letter documenting this review and any major observations (positive or negative) to the jurisdiction. Include observations regarding restoration implementation plans from SSA regarding all EPA approved TMDLs. If the annual report is late, missing information, or violations are discovered as a result of this screening and evaluation, follow the Enforcement SOP to determine the appropriate course of action.</p>
Enforcement:	If the MS4 jurisdiction's annual report submittal is found to be unacceptable, refer to the Enforcement SOP to determine the appropriate course of action.
Documentation: (attached)	<p>Elements of a Complete Annual Report</p> <p>Table A.1. Annual Report Screening and Observation Chart</p> <p>Table A.2. Annual Report Permit Log Book</p>
Filing Procedures:	<p>1.0 Save all checklists, forms, and signed correspondence electronically.</p> <p>2.0 Save all checklists, forms, and signed correspondence in the SSDS file cabinet room alphabetically by jurisdiction.</p>
Authorized:	Mr. Brian Clevenger, Program Manager

	Sediment, Stormwater, and Dam Safety Program
Date:	January 1, 2015

Elements of a Complete Annual Report

The following is a list of observations that provides evidence of a complete annual report:

- Annual report is submitted on or before the permit's anniversary date.
- Annual report's data are up-to-date and based on the State's previous fiscal year (July 1 through June 30).
- Electronic copies of the annual report, Attachment A, and all geographic information systems (GIS) coverage are submitted.
- Information on each program element included in the jurisdiction's annual report is complete as directed in the following SOPs:
 - Stormwater management program (SOP # MS4.B)
 - Erosion and sediment control program (SOP # MS4.C)
 - Illicit discharge detection and elimination program (SOP # MS4.D)
 - Property management and maintenance program (SOP # MS4.E)
 - Restoration plan and TMDLs (SOP # MS4.F)
 - Assessment of controls program (SOP # MS4.G)
- Miscellaneous permit requirements (e.g., legal authority, source identification, public education, and trash and litter control) are complete.
- Comprehensive fiscal analysis, including information on operational, capital, and stormwater utility fee, is provided.
- The jurisdiction's annual report is clearly posted on its web page.

Table A.1. Assessment and Recommendations

Use the below observation chart to assess the jurisdiction's annual report and progress toward meeting permit requirements. Note both compliance and deficiencies. If any deficiencies or concerns are observed, include recommendations, a corrective action plan, and a compliance schedule.

Permit Condition	MDE Assessment and Recommendations
Part V.A Annual Progress Reporting	<ul style="list-style-type: none"> • Annual report has been submitted by the due date (note due date and date of submittal) • Annual report covers the appropriate reporting period (note initial reporting period and subsequent changes to reporting period based on State Fiscal Year) • Annual report data correspond to Attachment A outline
Part IV.A Permit Administration	<ul style="list-style-type: none"> • An organizational chart of the jurisdiction's administration of the MS4 permit has been submitted • Changes to personnel or legal authority have been reported
Part IV.B Legal Authority	<ul style="list-style-type: none"> • Legal authority for compliance with all of the permit conditions has been certified • In the event that any provision of its legal authority was found to be invalid, the County has made the necessary changes and included them in its annual report
Part IV.C Source Identification	<ul style="list-style-type: none"> • Information has been reported/mapped (note any updates) as described in the permit on the following: <ul style="list-style-type: none"> ○ Storm drain systems ○ Industrial and commercial sources ○ Urban best management practices (BMPs) ○ Impervious surfaces ○ Monitoring locations ○ Water quality improvement projects
Part IV.D.1 Stormwater Management	<ul style="list-style-type: none"> • Is in compliance with the Stormwater Management Act of 2007 by implementing environmental site design (ESD) to the Maximum Extent Practicable (MEP) for new and redevelopment projects • Complete local stormwater management program implementation data have been submitted for analyses (e.g., number of Concept, Site Development, and Final plans received, number of redevelopment projects received, number of stormwater exemptions issued) • Nearly complete construction completion data (97%) have been compiled on MDE's Urban BMP Database including information on BMP type, drainage area, and as-built and inspection dates • Complete documentation of construction and maintenance inspections conducted of Environmental Site Design (ESD) systems and structural stormwater management facilities inspected has been submitted, including follow-up inspections and enforcement actions

Permit Condition	MDE Assessment and Recommendations
	<p>used to ensure compliance</p> <ul style="list-style-type: none"> • Modifications in implementing ESD to the MEP have been reported (note any problems with implementation or noncompliance with the Stormwater Management Act of 2007) • Modifications to local ordinances, regulations, and plan review process have been reported • Information is complete regarding types of plans received and exemptions and waivers issued
Part IV.D.2 Erosion and Sediment Control	<ul style="list-style-type: none"> • Program data (i.e., grading permits, disturbed acres, inspection and supervisory staff, inspections, violations, stop work orders, fines, and court cases) are sufficient to assess the level of program activity, permitting, and inspection and enforcement • Quarterly grading permits data have been submitted for earth disturbances over one acre • Improvements identified during past delegation reviews have been made • If the local erosion and sediment control ordinance has changed, it has been submitted to MDE for approval
Part IV.D.3 Illicit Discharge Detection and Elimination	<ul style="list-style-type: none"> • The minimum number of required outfalls has been visually and chemically inspected • A program to address illegal discharges, dumping, and spills, including initial response, reporting, follow-up, and enforcement actions has been developed and is being implemented • Adequate data and descriptions have been provided for each investigation initiated, illicit discharge source discovered, and elimination status • Industrial and commercial land uses and sites that have the potential to contribute significant pollution have been identified and prioritized for inspection • Annual visual surveys of identified commercial and industrial areas have been conducted
Part IV.D.4 Litter and Floatables	<ul style="list-style-type: none"> • Documentation of all litter control programs has been provided • Potential sources, ways of elimination, and opportunities for overall improvement have been identified • A public education and outreach program to reduce littering and increase recycling has been developed and is being implemented • Progress toward implementation of the public education program has been reported annually, which includes resources expended and the effectiveness of all program components
Part IV.D.5 Property Management and Maintenance	<ul style="list-style-type: none"> • Notices of Intent (NOIs) have been submitted to MDE for all municipally-owned facilities required to operate under the General Permit for Stormwater Discharges Associated with Industrial Activity • Status of stormwater pollution prevention plan (SWPPP)

Permit Condition	MDE Assessment and Recommendations
	<p>development and implementation for each facility have been submitted</p> <ul style="list-style-type: none"> • Schedules and procedures are submitted for the inspection of facilities, including prioritization of resources to ensure that required NOIs have been submitted and that facilities lacking proper controls are brought into compliance • Description of any pollutant reduction program for maintenance activities at county-owned facilities has been provided, including any MDE approved alternative activities
Part IV.D.6 Public Education	<ul style="list-style-type: none"> • A compliance hotline or similar mechanism for public reporting of water quality complaints (e.g., suspected illicit discharges, illegal dumping, and spills) has been maintained • Information has been provided to the general public about the benefits of environmental protection practices, including water conservation, stormwater management implementation, and proper disposal of household hazardous waste
Part IV.E Restoration Plans and TMDLs	<ul style="list-style-type: none"> • An impervious area baseline has been submitted in reporting year one in accordance with MDE's guidance, "Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated" • A comprehensive BMP implementation schedule has been submitted to meet the 20% restoration requirement within the five-year permit term • BMP reporting required by Attachment A and/or GIS database associated with restoration projects is complete • Restoration plans have been submitted for each EPA approved stormwater WLA by the end of year one • Opportunities for public participation in the development of watershed assessments and restoration plans were provided per permit requirements • Modifications to implementation plans have been made based on MDE review • Plan implementation has been adequately evaluated and tracked in the reporting years following MDE plan approval • The 20% restoration requirement has been met by the end of the permit term • Detailed watershed assessments have been completed for the entire jurisdiction by the end of the permit term • The annual TMDL assessment report is in compliance with permit conditions outlined in Part IV.E.4
Part IV.F Assessment of Controls	<ul style="list-style-type: none"> • At least 8 or 12 storms events have been monitored (depending on permit condition) in the approved watershed and required sampling protocols were followed • All databases for biological, chemical, and physical monitoring data

Permit Condition	MDE Assessment and Recommendations
	<p>are complete</p> <ul style="list-style-type: none"> • Event mean concentrations (EMCs) and flow measurements have been used to estimate annual and seasonal pollutant loads and reductions, for the calibration of watershed assessment models, and to assess the cumulative effects of watershed restoration activities • Benthic macroinvertebrate samples have been gathered per permit condition Part IV.F.1.b using sampling protocols noted in Part IV.F.1.b.ii or an alternate MDE approved method • Physical monitoring of the stream channel has been performed per permit condition Part IV.F.1.c • Monitoring of the selected watershed has been conducted to determine the effectiveness of stormwater management practices for stream channel protection, including stream channel stability, was conducted • Stream profile and survey have been conducted and compared with baseline conditions • A hydrologic and/or hydraulic model was used to assess rainfall and discharge on channel geometry in the fourth year of the permit
Part IV.G Program Funding	<ul style="list-style-type: none"> • A fiscal analysis of the capital, operation, and maintenance expenditures necessary to comply with all conditions of the permit has been submitted • Adequate program funding to comply with all conditions of this permit is maintained (note funds raised through the Watershed Protection and Restoration Act)

Table A.2. Annual Report Permit Log Book

NPDES Phase I Permits	Annual Report Review					Impervious Area Restoration			Fiscal Budget (1,000)	
	Permit Issue Date	Required Submittal	Actual Submittal	MDE Reviewer	Review Letter Sent	Baseline Impervious (Acres)	Restored (Acres)	Restored (Percent)	Operating	Capital
Anne Arundel County	2/12/2014	2/12/2015		Stew						
Baltimore City	12/27/2013	12/27/2014		Stew						
Baltimore County	12/23/2013	12/23/2014		Andrew						
Carroll County	7/14/2005	7/14/2014		Dela						
Charles County	7/31/2002	12/20/2014		Deb						
Frederick County	3/11/2002	3/11/2014		Maria						
Harford County	11/1/2004	11/1/2014		Maria						
Howard County	6/20/2005	9/15/2014		Dela						
Montgomery County	2/16/2010	2/16/2015		Andrew						
Prince George's County	1/2/2014	1/2/2015		Deb						
State Highway Administration	10/21/2005	10/21/2014		Ray						
Totals:										

B. Stormwater Management

Title:	MS4 – Stormwater Management	SOP #: MS4.B
Administration:	Water Management Administration	Effective Date: January 1, 2015
Program:	Sediment, Stormwater, and Dam Safety Program	Revision Date:
Division:	Program Review Division	
Purpose:	Ensure that each Phase I MS4 jurisdiction has an acceptable stormwater management program that meets State and federal requirements for the control of runoff from new development and redevelopment.	
References:	CFR (40 subsection 122.26(d)(2)(iv)(A)(2)) – Federal requirements for post-construction runoff management COMAR (26.17.02) – Maryland regulations for stormwater management requirements	
Overview:	MDE’s evaluation of a jurisdiction’s stormwater management program consists of two components. The first is an annual screening of the required data and narrative of activities submitted in the jurisdiction’s annual report to assess the status toward meeting stormwater management permit requirements. The second component is an on-site (field) inspection at least once every five-year permit term to review a jurisdiction’s ordinance, procedures, and a random selection of recently approved development projects to verify that stormwater management designs and practices are adequately constructed and maintained in compliance with State law.	
Procedures:	<p>1.0 <u>Annual Screening</u>. Evaluate annual program implementation data, local ordinances, and procedures to assess the implementation of a jurisdiction’s stormwater management program that includes:</p> <p>1.01 Verifying that the jurisdiction has provided stormwater program implementation data in its annual report;</p> <p>1.02 Screening and assessing local stormwater management plan review data including:</p> <ul style="list-style-type: none"> A. Number of concept, site development, and final plans received. Plans that are re-submitted as a result of a revision or in response to comments should not be considered as a separate project; B. Number of redevelopment projects received; C. Number of stormwater exemptions issued; and D. Number and type of waivers received and issued, including those for quantity control, quality control, or both. Multiple requests for 	

waivers may be received for a single project and each should be counted separately, whether part of the same project or plan. The total number of waivers requested and granted for qualitative and quantitative control must be documented.

1.03 Screening and assessing local stormwater management program implementation data that includes:

- A. Construction inspection information for all ESD treatment practices and structural stormwater management facilities, including the number of inspections conducted and violation notices issued;
- B. Complete construction completion data compiled on MDE's Urban BMP Database including information on BMP type, drainage area, and as-built and inspection dates; and
- C. Documentation identifying the ESD systems and structural stormwater management facilities inspected, number of maintenance inspections, follow-up inspections, enforcement actions used to ensure compliance, maintenance inspection schedules, and any other relevant information submitted in the annual reports.

1.04 Reviewing the local stormwater management ordinance if the jurisdiction reported that the ordinance has changed since MDE's most recent approval. Refer to paragraph 2.01 for details on ordinance reviews.

2.0 Field Inspection. At least once every five-year permit term (or more frequently for a State triennial review), conduct a field inspection of each jurisdiction's stormwater management program in coordination with the local plan review and enforcement authorities. The inspection includes a review of a jurisdiction's stormwater management ordinance, plan review procedures, and construction and maintenance inspection program to determine if they adequately meet State and federal requirements. Assess the following local program elements:

2.01 A pre-inspection review of the jurisdiction's stormwater management ordinance shall ensure that:

- A. The jurisdiction's ordinance has not changed since MDE's most recent approval;
- B. If the jurisdiction's ordinance has changed, it has been submitted to MDE for review and approval;
- C. For ordinances submitted to MDE, modifications are reviewed for:
 - i. scope of activities requiring stormwater management plans;
 - ii. permit and plan requirements, including application procedure, plan design requirements, and time limitations;
 - iii. procedures to ensure that a required stormwater management plan is approved by the jurisdiction prior to the

	<p>issuance of a building or grading permit;</p> <ul style="list-style-type: none"> iv. specific inspection and enforcement procedures and options available to ensure compliance with an approved stormwater management plan; v. right of entry for inspection and enforcement activities associated with an approved stormwater management plan; and vi. adherence to MDE's model ordinance and State regulations. <ul style="list-style-type: none"> D. The local jurisdiction is notified in writing of the acceptability of its modified ordinance; E. MDE has approved a local jurisdiction's modified ordinance prior to being locally adopted; and F. A final signed copy of the jurisdiction's MDE approved ordinance is kept in the Program Review Division's files, and a scanned copy is filed electronically. <p>2.02 Plan Review Procedures: discuss with local plan review staff and randomly select a number of recently approved plans to determine the effectiveness of the jurisdiction's procedures, including:</p> <ul style="list-style-type: none"> A. Quality, content, and completeness of County approved plans; B. Effectiveness of the local plan review processes for: <ul style="list-style-type: none"> i. incorporating the three step plan review; ii. the coordination and frequency of communication of various local agencies involved in the planning process; iii. using plan review checklists or pre-construction meeting notes; iv. specific conditions required for granting waivers and exceptions; v. combining plan review phases; and vi. the use of MDE approved standard plans. C. Adequate staffing (i.e., sufficient number of plan reviewers and inspectors, including full-time, part-time, and contracted staff). <p>2.03 Inspection, Maintenance, and Enforcement Procedures: randomly select a number of sites under construction, recently completed, and from prior development to determine if:</p> <ul style="list-style-type: none"> A. Approved stormwater management plans ensure that ESD is implemented to the MEP; B. Complete inspections of the sites are being conducted during critical stages of the construction process; C. As-built, 1-year and 3-year inspection frequencies are being met to ensure that stormwater management facilities and systems are being constructed and maintained properly;
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	<p>D. Written inspection reports are routinely prepared and on-site personnel and the owner/developer are notified in writing of maintenance items that need to be performed; and</p> <p>E. Enforcement procedures are being adequately administered by jurisdictions when BMPs are not constructed or maintained properly. The procedures must include the use of violation notices, stop work orders, penalties, the withholding of bonds, and follow-up inspections to ensure compliance.</p> <p>3.0 <u>Documentation</u>. Use the attached checklists to guide an effective annual report screening and field inspection. If photographs are taken to support a compliance determination, file these photographs in the appropriate audit folder and include a description for each photograph. Complete the inspection log book to keep record of annual screenings, inspections, dates of review, and stormwater management program status.</p> <p>4.0 <u>Determination</u>. Following the screening or inspection of an MS4 jurisdiction's stormwater management program, the acceptability of the program must be determined. This is to be included in a written response to the jurisdiction, either as outlined in SOP # MS4.A if part of an annual screening or the Enforcement SOP if part of a five-year inspection.</p>
Enforcement:	If a jurisdiction's stormwater management program is found to be unacceptable, refer to the Enforcement SOP to determine the appropriate course of action.
Documentation: (attached)	<p>Elements of an Effective Stormwater Management Program</p> <p>Table B.1. Stormwater Management Program Review Checklist</p> <p>Table B.2. Stormwater Management Program Review Inspection Report</p> <p>Table B.3. Stormwater Management Program Field Inspection Log Book</p>
Filing Procedures:	<p>1.0 Save all checklists, forms, and signed correspondence electronically.</p> <p>2.0 Save all checklists, forms, and signed correspondence in the SSDS file cabinet room alphabetically by jurisdiction.</p>
Authorized:	Mr. Brian Clevenger, Program Manager Sediment, Stormwater, and Dam Safety Program
Date:	January 1, 2015

Elements of an Effective Stormwater Management Program

The following is a list of observations that provides evidence of an effective local stormwater management program:

- The plan review staff has a good understanding of design requirements for implementing ESD to the MEP on new development and redevelopment.
- Local plan review agencies have well-structured criteria, procedures, and checklists for the comprehensive review of stormwater management for development projects.
- The plan review staff follows review procedures for ESD projects (per local ordinance), and whenever questions come up, communicates with MDE for resolution.
- The three step plan review process is well coordinated among all of the plan review agencies (e.g., county stormwater review agencies, soil conservation districts, and erosion and sediment control agencies).
- The jurisdiction utilizes consistent decision making and follows a clear policy when “fast-tracking” projects (i.e., skipping one or more plan review steps).
- Approved plans, including stormwater management reports, are clear, complete, and in compliance with Maryland’s Stormwater Design Manual.
- Staffing levels are adequate for conducting comprehensive reviews in a timely fashion.
- All BMPs reviewed and approved by the jurisdiction are recorded in MDE’s urban BMP database, including important information on BMP type, drainage area, impervious acres, and as-built and inspection dates.
- A random selection of stormwater BMPs within the jurisdiction indicates that a majority of them are functioning well and are being properly maintained.
- Documentation of inspections and reports meets the State’s triennial BMP inspection requirements and the inspection of stormwater BMPs are being prioritized effectively.
- Inspectors are educating builders and homeowners on the proper implementation and maintenance of ESD practices.
- There is communication among the plan reviewers and field inspectors and each is obtaining feedback from the other.
- When construction or maintenance violations are discovered, the jurisdiction has enforcement procedures for the effective resolution of problems.
- When BMPs are found to be in continual non-compliance, the jurisdiction uses progressive enforcement procedures (e.g., violation notices, stop work orders, civil penalties) to ensure that BMPs are maintained and functioning properly.
- The number of inspection staff is adequate for conducting BMP construction and maintenance inspections.
- Supervisors are engaged and supportive of plan review and inspection staff in implementing Maryland’s stormwater management program.

Table B.1. Stormwater Management Program Review Checklist

Plan Review

- ☐ Procedures for reviewing plans
- ☐ Staffing and plan reviewers
 - ☐ Current structure
 - ☐ Current and future staffing level
 - ☐ Use of contractors
 - ☐ Evidence of backlog
- ☐ List of departments involved in the plan review process
- ☐ Level of cooperation with other departments and method/frequency of coordination
- ☐ Pre-submittal meetings held and groups in attendance
- ☐ Challenges and common issues
 - ☐ Possible solutions
- ☐ Conditions required for Waivers / Grandfathering (Administrative waivers)
- ☐ Use of a standard plan (if applicable)
- ☐ Customization of the three step plan review process
- ☐ Documentation of a successful plan review process
 - ☐ Checklists or other documents used for different phases in the three step process
 - ☐ Stormwater management reports
 - ☐ Documentation of encouraging and enforcing ESD to the MEP
 - ☐ Copies of plans, reports, correspondence, etc.
- ☐ Plan and computation consistency / accuracy
- ☐ Plan expiration timeline and renewal procedures

Construction Inspection

- ☐ Procedures for inspection
- ☐ Pre-construction meetings conducted
- ☐ Personnel and number of people completing different phases of inspection
 - ☐ Status with inspection schedule (on schedule, falling behind)
- ☐ Challenges and common issues
 - ☐ Possible solutions
- ☐ Enforcement procedures
 - ☐ Conditions and use of violation notices
 - ☐ Conditions and use of stop work orders
- ☐ Documentation of completed inspections
 - ☐ Evidence of inspection during critical phases
 - ☐ Construction checklists used
 - ☐ Construction inspection logs used

- ☐ Evidence of as-built inspections

Maintenance

- ☐ Procedures for maintenance inspections
- ☐ Tools used for public outreach and education
 - ☐ Frequency of public meetings and educational events
- ☐ Challenges and common issues
 - ☐ Level of cooperation and communication with homeowner associations
- ☐ Means for ensuring maintenance
 - ☐ Conditions and use of bond withholdings
 - ☐ Bond amount (%)
 - ☐ Use and occupancy restrictions
 - ☐ Final site approval
- ☐ Documentation
 - ☐ Use of maintenance logs
 - ☐ Use of maintenance checklists
 - ☐ Other relevant documentation

Field Review

Site 1: (Name of Site)

- Observations and site notes
- Relevant pictures

Site 2: (Name of Site)

- Observations and site notes
- Relevant pictures

Site 3: (Name of Site)

- Observations and site notes
- Relevant pictures

Site 4: (Name of Site)

- Observations and site notes
- Relevant pictures

Site 5: (Name of Site)

- Observations and site notes
- Relevant pictures



Table B.2. Stormwater Management Program Review Inspection Report

Jurisdiction: _____ **Review Date:** _____

MDE Reviewer: _____ **County Contact:** _____

NPDES Status: _____

ORDINANCE

Citation: _____

First Adopted: _____

Last Revision: _____

State Approval: _____

Other Policies: ☐ Stormwater Remediation Fee
☐ Other (list below)

Comments:

PLAN REVIEW

Agency(ies): _____

Staff: Supervisory: _____

 Review: _____

 Administrative: _____

Discussion:

PLAN APPROVAL

To evaluate the quality of plan approval, the following files were reviewed:

Name: _____ Local ID: _____ Phase: **Concept**

Type: _____ Date: _____

(check all that apply)

- ☐ New Development
- ☐ Redevelopment
- ☐ Restoration
- ☐ Other (details below)

Description: _____

Project Data:

Land Use:		Size:	acres	Waivers:	
Imp. Area (%):		LOD:	acres	<input type="checkbox"/>	Administrative
Wooded RCN:				<input type="checkbox"/>	Infill
Post RCN:				<input type="checkbox"/>	Quantity – Tidal Disch.
Reduced RCN:				<input type="checkbox"/>	Quantity – Other
ESD				<input type="checkbox"/>	Quality
	Targets:	Provided:			
ESD _v =	in.	in.			
P _E =	cf.	cf.			

Discussion:

Name: _____ **Local ID:** _____ **Phase:** Concept
Type: ☐ New Development **Date:** _____
(check all that apply) ☐ Redevelopment
☐ Restoration
☐ Other (details below)

Description: _____

Project Data:

Land Use:		Size:	acres	Waivers:	
Imp. Area (%):		LOD:	acres	<input type="checkbox"/>	Administrative
Wooded RCN:				<input type="checkbox"/>	Infill
Post RCN:				<input type="checkbox"/>	Quantity – Tidal Disch.
Reduced RCN:				<input type="checkbox"/>	Quantity – Other
ESD				<input type="checkbox"/>	Quality
	Targets:	Provided:			
ESD_v =	in.	in.			
P_E =	cf.	cf.			

Discussion:

CONSTRUCTION AND MAINTENANCE INSPECTION AND ENFORCEMENT

Agency(ies): _____

Staff: Supervisory: _____

 Review: _____

 Administrative: _____

Discussion:

Inspections: To evaluate the quality of inspections, the following sites were visited:

CONCLUSION

Table B.3. Stormwater Management Program Field Inspection Log Book

Jurisdiction	Review Type	Scheduled Dates		Ordinance		Program Review			MDE Lead
		Office	Field	MDE Approval (Date)	Local Ordinance Adopted (Date)	ESD to the MEP Met (Yes/No/Partial)	Local Program Status (Pass/Fail)	MDE Formal Review Letter Sent (Date)	
Anne Arundel County									Stewart
Baltimore County									Stewart
Charles County									Stewart
Frederick County									Deb
Garrett County									Deb
Prince George's County									Deb
Queen Anne's County									Stewart
Worcester County									Deb

C. Erosion and Sediment Control

Title:	MS4 – Erosion and Sediment Control	SOP # MS4.C
Administration:	Water Management Administration	Effective Date: January 1, 2015
Program:	Sediment, Stormwater, and Dam Safety Program	Revision Date:
Division:	Program Review Division	
Purpose:	Ensure that Maryland delegated erosion and sediment control programs in permitted MS4 jurisdictions meet State and federal requirements for the control of runoff from active construction sites.	
References:	CFR (40 subsection 122.26(d)(2)(iv)(D)) – Federal requirements for erosion and sediment control COMAR (26.17.01) – Regulations detailing Maryland’s erosion and sediment control program requirements	
Overview:	MDE’s evaluation of an MS4 jurisdiction’s erosion and sediment control program consists of two components. The first component is an annual screening of the jurisdiction’s required data and activities submitted in the annual report to assess the jurisdiction’s status toward meeting its permit requirements. The second component is an on-site (field) inspection, at least once every five-year permit term, to review ordinances, procedures, and a representative sample of active construction sites to ensure that local programs are effective for erosion and sediment control and are in compliance with State and federal regulations.	
Procedures:	<p>1.0 <u>Annual Screening</u>. Conduct a review of annual program implementation data, local ordinances, and procedures to assess the implementation of a jurisdiction’s erosion and sediment control program that includes:</p> <p>1.01 Verifying the jurisdiction has provided erosion and sediment control implementation data in its annual report, or submitted the delegation application form to MDE;</p> <p>1.02 Reviewing implementation data to assess the level of program activity, permitting, and inspection and enforcement, including an assessment on the number of:</p> <ul style="list-style-type: none"> A. Grading permits; B. Disturbed acres; C. Inspection and supervisory staff; D. Inspections (two-week frequency); and E. Violations, stop work orders, fines, and court cases. 	

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| | <p>1.03 Reviewing the local erosion and sediment control ordinance if the jurisdiction reported that the ordinance has changed (refer to paragraph 2.01.B. for details on ordinance reviews); and</p> <p>1.04 Compiling all local program implementation data in MDE's inspection and enforcement spreadsheet for Statewide program analysis and for Chesapeake Bay Program reporting.</p> <p>2.0 <u>Field Inspection.</u> At least once every five-year permit term (or more frequently for State delegation review), conduct a field inspection that includes:</p> <p>2.01 A pre-inspection document review of the jurisdiction's erosion and sediment control ordinance, which shall ensure that:</p> <ul style="list-style-type: none"> A. The jurisdiction's ordinance has not changed since MDE's most recent approval; B. If the jurisdiction's ordinance has changed, it has been submitted to MDE for review and approval; C. For ordinances submitted to MDE, an approval is made based upon: <ul style="list-style-type: none"> i. scope of activities requiring grading and building permits and erosion and sediment control plans; ii. permit and plan requirements including application procedure, plan design requirements, and time limitations; iii. procedures to ensure that a required erosion and sediment control plan is approved by the appropriate approval authority prior to the issuance of a building or grading permit; iv. specific inspection and enforcement procedures and options available to ensure compliance with an approved erosion and sediment control plan; v. right of entry for inspection and enforcement activities associated with an approved erosion and sediment control plan; and vi. adherence to MDE's model ordinance and State regulations. D. A final signed copy of the jurisdiction's MDE approved ordinance is kept in the Program Review Division's erosion and sediment control files, and a scanned copy is filed electronically. <p>2.02 An inspection of active construction sites in coordination with the local enforcement and plan review authorities. A randomized, representative sample of sites shall be selected and inspected to determine that:</p> |
|--|---|

	<p>A. An approved erosion and sediment control plan and all required permits are on-site as required;</p> <p>B. The local enforcement authority has inspected sites with an approved erosion and sediment control plan an average of once every two weeks;</p> <p>C. Complete inspections of the sites are being conducted and that written inspection reports are routinely prepared;</p> <p>D. On-site personnel and the owner/developer are notified in writing when violations are observed; and</p> <p>E. The local enforcement authority is using the appropriate enforcement action when erosion and sediment control violations occur.</p> <p>3.0 <u>Documentation</u>. Use the attached checklists to guide an effective annual report screening and field inspection. If photographs are taken to support a compliance determination, file these photographs in the appropriate audit folder and include a description for each photograph. Complete the inspection log book to keep record of annual screenings, inspections, dates of review, and erosion and sediment control program status.</p> <p>4.0 <u>Determination</u>. Following the screening or inspection of an MS4 jurisdiction's erosion and sediment control program, the acceptability of the program must be determined. This is to be included in a written response to the jurisdiction, either as outlined in SOP # MS4.A if part of an annual screening or the Enforcement SOP if part of a five-year inspection.</p>
Enforcement:	If the MS4 jurisdiction's erosion and sediment program is found to be unacceptable, refer to the Enforcement SOP to determine the appropriate course of action.
Documentation: (attached)	<p>Elements of an Effective Erosion and Sediment Control Program</p> <p>Table C.1. Erosion and Sediment Control Program Review Site Inspection Checklist</p> <p>Table C.2. Erosion and Sediment Control Program Field Inspection Summary Report</p> <p>Table C.3. Erosion and Sediment Control Program Field Inspection Log Book</p>
Filing Procedures:	<p>1.0 Save all checklists, forms, and signed correspondence electronically.</p> <p>2.0 Save all checklists, forms, and signed correspondence in the SSDS file cabinet room alphabetically by jurisdiction.</p>
Authorized:	Mr. Brian Clevenger, Program Manager Sediment, Stormwater, and Dam Safety Program
Date:	January 1, 2015

Elements of an Effective Erosion and Sediment Control Program

The following is a list of observations that provides evidence of an effective local erosion and sediment control program:

- Inspectors have an approved and up-to-date set of plans.
- Inspectors have been adequately trained to conduct thorough erosion and sediment control inspections.
- Inspectors conduct thorough inspections (i.e., drive-by inspections are uncommon).
- Inspectors consistently verify that BMPs approved on plans are properly installed.
- Inspectors consistently ensure that BMPs are being adequately maintained.
- Increased stabilization requirements (3-7 days) are being implemented.
- The approved sequence of construction is being followed.
- 20-acre grading units are being followed and grading units are not being approved prematurely.
- Inspectors document all inspection results using a checklist or other form.
- Inspectors follow a formal, written, escalating enforcement policy.
- Staff resources are sufficient for ensuring a two-week inspection frequency.
- Inspectors consult the plan approval authority when the controls on the approved plan are not working adequately in the field.
- Plan review staff possesses adequate guidance and criteria for reviewing erosion and sediment control plans.
- Inspectors are able to enforce local capital projects (e.g., parks, roads, school building construction, etc.) without political pressure.
- Supervisors provide sufficient oversight and support of the inspection staff.



Table C.1. Erosion and Sediment Control Program Review Site Inspection Checklist

Review Date _____ Jurisdiction _____

MDE Reviewer _____ County/Agency Staff _____

Site Name/Address _____

Approval Date by SCD/County/City _____ Disturbed Acreage _____

Type of Project: ☐ Residential ☐ Commercial ☐ Industrial ☐ Mix-use ☐ Capital

STAGE OF CONSTRUCTION

☐ Installation of E&S Controls ☐ Clearing and Grubbing ☐ Rough Grading ☐ Utility Installation
☐ Building Construction ☐ Finished Grading ☐ Final Stabilization

GENERAL SITE CONDITION

Does the approved plan appear to be providing adequate Erosion and Sediment Control? ☐ Yes ☐ No ☐ See notes
Has the local authority made minor field modifications? ☐ Yes ☐ No ☐ See notes
Has the local authority requested revisions from the appropriate plan approval authority? ☐ Yes ☐ No ☐ See notes
Is the construction following the phasing and sequencing plan? ☐ Yes ☐ No ☐ See notes

GRADING

☐ Benching ☐ Serrated Slope

Are grading practices adequately installed and maintained? ☐ Yes ☐ No ☐ N/A

Comments/Action Needed: _____

STABILIZATION

☐ SCE/With Wash Rack ☐ Temporary Stabilization ☐ Incremental Stabilization
☐ Permanent Stabilization ☐ Seeding and Mulching ☐ Soil Stabilization Matting
☐ Heavy Use Area Protection ☐ Stockpile Area ☐ Soil Preparation/Topsoiling

Are stabilization practices adequately installed and maintained? ☐ Yes ☐ No ☐ N/A

Comments/Action Needed: _____

Are all disturbed areas that have been inactive for 3-7 days or more properly stabilized? (Stockpiles, hillsides, etc.) ☐ Yes ☐ No ☐ N/A

Comments/Action Needed: _____

WATER CONVEYANCE

☐ Earth Dike ☐ Temporary Swale ☐ Clear Water Diversion Pipe
☐ Temporary Storm Drain Diversion ☐ Diversion Fence ☐ Other _____

Are water conveyance practices adequately installed and maintained? ☐ Yes ☐ No ☐ N/A

Comments/Action Needed: _____

EROSION CONTROL

- | | | |
|---|---|---|
| <input type="checkbox"/> Stone Check Dam | <input type="checkbox"/> Outlet Protection | <input type="checkbox"/> Riprap Inflow Protection |
| <input type="checkbox"/> Pipe Slope Drain | <input type="checkbox"/> Gabion Inflow Protection | <input type="checkbox"/> Other _____ |

Are erosion control practices adequately installed and maintained?

☐ Yes ☐ No ☐ N/A

Comments/Action Needed: _____

FILTERING

- | | | |
|---|--|---|
| <input type="checkbox"/> Silt Fence | <input type="checkbox"/> Silt Fence on Pavement | <input type="checkbox"/> Super Silt Fence |
| <input type="checkbox"/> Filter Berm | <input type="checkbox"/> Temporary Stone Outlet Struc. | <input type="checkbox"/> Temporary Gabion Outlet Struc. |
| <input type="checkbox"/> Storm Drain Inlet Protection | <input type="checkbox"/> Filter Log | <input type="checkbox"/> Other _____ |

Are filtering practices adequately installed and maintained?

☐ Yes ☐ No ☐ N/A

Comments/Action Needed: _____

DEWATERING

- ☐ Sump Pit ☐ Filter Bag ☐ Removable Pumping Station ☐ Portable Sediment Tank

Are dewatering practices adequately installed and maintained?

☐ Yes ☐ No ☐ N/A

Comments/Action Needed: _____

SEDIMENT TRAPPING

- ☐ Sediment Basin(s) #____ ☐ Pipe Outlet Sediment Trap(s) #____ ☐ Riprap Outlet Sediment Trap(s) #____
☐ Stone/Riprap Outlet Sediment Trap(s) #____

Are sediment trapping practices adequately installed and maintained?

☐ Yes ☐ No ☐ N/A

Comments/Action Needed: _____

OFFSITE IMPACT

Is there evidence of work outside the limits of the approved plan?

☐ Yes

☐ No

Are there off-site impacts or potential to pollute?

☐ Yes

☐ No

Comments/Action Needed: _____

ENFORCEMENT ACTIVITY

In general is the two week inspection frequency being met?

☐ Yes

☐ No

What enforcement action(s) have been used. ☐ Inspection Report

☐ Violation

☐ Stop Work

☐ Fine

Have proper enforcement actions been taken for past violations?

☐ Yes

☐ No

Is the site currently in compliance with approval plan?

☐ Yes

☐ No

Comments/Action Needed: _____

Photo Documentation?

☐ Yes

☐ No

If yes, attach to this report.

ADDITIONAL NOTES: _____

Table C.2. Erosion and Sediment Control Program Field Inspection Summary Report

E&SC Delegation		Plan Data				Adequate Implementation/Maintenance														Enforcement					
Jurisdiction Date	Disturbed Acres	2-Year Approval		Provides Adequate Control		Grading		Stabilization		Water Conveyance		Erosion Control		Filtering		Dewatering		Sediment Trapping		Off-Site/Potential Water Impacts		Two Week Inspection Frequency		Adequate Enforcement	
Site Name		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
Totals	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent		####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####	####
Site Comments																									
MDE Reviewers:																									

Table C.3. Erosion and Sediment Control Program Field Inspection Log Book

Delegated Jurisdiction	Last Review	Length (Years)	Year Delegated Until (July)	App Sent	App Received	Field Inspection Date	Date MDE Approved Local Ordinance	Date Ordinance Adopted Locally	Delegation Approved (Y/N)	Delegation Length (Years)	Year Delegated Until (July)	MDE Review Sent	MDE Reviewer*
Baltimore County	2011	2	2014	8/29/2013	9/19/2013	10/18/2013	10/11/2012	1/9/2013	No	0	2014	3/14/2014	Maria , Ray, Dela
Calvert (Partial) County	2011	2	2014	8/29/2013	9/25/2013	9/24/2013	4/11/2014		Yes	2	2016	1/8/2014 and 4/11/2014	Maria
Charles County	2011	2	2014	8/29/2013	9/27/2013	10/30/2013	12/28/2012	8/2/2013	Yes	2	2016	1/8/2014	Maria
Frederick County	2011	2	2014	8/29/2013	9/25/2013	11/25/2013	9/24/2012	1/9/2013	Yes	2	2016	2/12/2014	Maria , Dela
Kent County	2011	2	2014	8/29/2013	9/30/2013	12/18/2013	1/31/2013	5/21/2013	Yes	2	2016	3/7/2014	Dela
Montgomery County	2011	2	2014	8/29/2013	9/19/2013	11/6/2013	9/24/2012	3/19/2013	Yes	2	2016	1/6/2014	Ray , Dela, Maria
Aberdeen	2011	2	2014	8/29/2013	10/18/2013	11/20/2013			Yes	2	2016	3/7/2014	Dela
Annapolis	2011	2	2014	8/29/2013	10/9/2013	11/14/2013	2/18/2013	10/14/2013	Yes	2	2016	3/7/2014	Dela , Maria
Baltimore City	2011	2	2014	8/29/2013	2/3/2014	3/13/2014	10/15/2012	2/4/2013	Yes	2	2016	4/4/2014	Dela , Maria
Greenbelt	2011	2	2014	8/29/2013	9/27/2013	12/27/2013	10/24/2012	12/20/2012	Yes	2	2016	3/7/2014	Dela
Laurel	2011	2	2014	8/29/2013	9/5/2013	12/12/2013	3/7/2014		Yes	1	2015	3/7/2014	Dela
11 reviews													
* Lead reviewer in bold													

F. Restoration Plans and TMDLs

Title:	MS4 – Restoration Plans and TMDLs	SOP # MS4.F
Administration:	Water Management Administration	Effective Date: January 1, 2015
Program:	Sediment, Stormwater, and Dam Safety Program	Revision Date:
Division:	Program Review Division	
Purpose:	Ensure that watershed assessments and plans are being implemented to restore 20% of a Phase I MS4 jurisdiction's impervious surface area that is not already controlled to the MEP and that the plans are consistent with applicable stormwater wasteload allocations (WLAs) developed under EPA approved total maximum daily loads (TMDLs).	
References:	CFR (40 subsection 122.44(k)) – Federal requirements for establishing BMPs to control or abate the discharge of stormwater pollutants and to carry out the purposes and intent under section 402(p) of the CWA	
Overview:	MDE's evaluation of a local MS4 jurisdiction's restoration plans and TMDLs consists of two components. The first component will be an annual internal screening of the jurisdiction's relevant data to ensure that all MS4 jurisdictions provide adequate watershed assessments, opportunities for public participation, restoration plans, and a schedule for BMP and programmatic implementation to meet 20% impervious area restoration requirements and stormwater WLAs. The second component consists of a joint local and State on-site (field) inspection at least once every five-year permit term. The inspection includes a review of all policies and procedures that support restoration plans and the sampling of a subset of restoration BMPs and municipal programs to verify field implementation.	
Procedures:	<p>1.0 <u>Annual Screening</u>. Conduct an annual screening of an MS4 jurisdiction's watershed restoration program by reviewing the jurisdiction's annual report. This screening includes:</p> <p>1.01 A review of the jurisdiction's first year annual report to verify the establishment of an acceptable restoration program. In the first year, a jurisdiction must:</p> <ul style="list-style-type: none"> A. Establish an impervious area baseline according to MDE's guidance, "Accounting for Impervious Acres Treated and Stormwater Wasteload Allocations"; B. Propose a BMP implementation schedule to meet the 20% restoration requirement within the five-year permit term; C. Develop watershed assessments for each EPA approved stormwater 	

WLA. The MDE reviewer shall use the TMDL Tool Kit to ensure that local assessments include:

- i. all EPA approved TMDLs with stormwater WLAs (individual or aggregate loads);
- ii. baseline year, pollutant load, and percent reduction necessary for meeting a target load that is consistent with the approved TMDL; and
- iii. the same TMDL analysis or a similar analysis as described in MDE's guidance used for calculating loads and net reductions.

D. Develop watershed restoration plans that include:

- i. a schedule of BMP and program implementation that is adequate for meeting the 20% impervious area restoration requirement during the current permit term;
- ii. information on how and when stormwater WLAs in EPA approved TMDLs will be met, including a final date for reaching the target load;
- iii. benchmarks for determining if adequate progress is being made during the permit term for meeting final permit restoration requirements; and
- iv. public participation requirements for commenting and incorporating material issues.

1.02 Placing the jurisdiction's entire annual report and associated data on WMA's drive shared with MDE's Science Services Administration (SSA). The permit administrator must notify by email the appropriate SSA contact informing him or her that the annual report and data have been submitted by the jurisdiction. Include a link to the WMA/SSA shared folder in which the files are saved so that SSA can provide technical review of the following:

- A. Urban BMP reporting for Chesapeake Bay TMDLs; and
- B. Implementation plans for approved stormwater WLAs.

1.03 In years 2 through 5 of the permit, a screening of annual report data regarding the implementation of watershed restoration plans to determine if MDE approved schedules and benchmarks are being met. The permit administrator must notify by email the appropriate SSA contact informing him or her that the annual report and data have been submitted by the jurisdiction. Include a link to the WMA/SSA shared folder in which the files are saved. This screening includes:

- A. An assessment of proposed, under construction, and completed restoration BMPs, relative to proposed benchmarks and schedules;
- B. An assessment of a jurisdiction's restoration program for:

	<ul style="list-style-type: none"> i. operating procedures; ii. schedules and level of activity; and iii. equivalent impervious area calculations. <p>C. A review of any restoration implementation plans for stormwater WLAs associated with any EPA approved TMDL within the last year; and</p> <p>D. A complete compilation of BMP and program data on the jurisdiction's urban BMP and restoration databases.</p> <p>2.0 <u>Field Inspection.</u> A joint local and State field inspection of each jurisdiction's watershed restoration program must occur at least once during the permit term. A jurisdiction's approved restoration plans must be reviewed (see SOP 1.01.D. above) before the field visit and a representative selection of restoration projects and programs shall be selected for field inspection.</p> <p>2.01 Inspect structural and non-structural BMPs that are randomly selected from the list of BMPs found in the jurisdiction's implementation schedule and ensure that:</p> <ul style="list-style-type: none"> A. Each BMP has an approved set of construction drawings; B. The amount of managed water quality runoff volume is clearly indicated on the approved final construction drawings; C. Construction inspections and reports are documented; D. As-built inspections and approvals are conducted; E. Complete BMP data are recorded on the urban BMP database; F. Maintenance inspections are being performed at least once every three years; and G. Any implementation or maintenance problems are being addressed, re-inspected, and corrected on a timely basis. <p>2.02 Inspect County or municipal programs (e.g., street sweeping, catch-basin cleaning) to ensure that the following are in place and being utilized:</p> <ul style="list-style-type: none"> A. Schedule of implementation; B. Standard operating procedures; C. Proper maintenance of equipment; D. Personnel training in BMPs; and E. Proper BMP recording on MDE's urban BMP database. <p>3.0 <u>Documentation.</u> Use the attached checklists to guide an effective annual report screening and field inspection. If photographs are taken to support a compliance determination, file these photographs in the appropriate audit folder and include a description for each photograph. Complete the inspection log book to keep a record of annual screenings, inspections, dates of review, and watershed assessment and restoration program status.</p>
--	---

	<p>4.0 <u>Determination.</u> Following the review of the first year annual report, the acceptability of a jurisdiction's impervious area baseline, 20% restoration schedule, and implementation plans for each approved stormwater WLA must be determined. This determination is to be included in a written response to the jurisdiction that summarizes the findings from the first year annual report screening (refer to SOP # MS4.F paragraph 1.01). Additionally, in years 2 through 5 of the permit term, provide a written response to the jurisdiction that summarizes the findings from each annual screening according to SOP MS4.F.1.03, or according to MS4.F.2.0 if part of the field inspection.</p>
Enforcement:	If the jurisdiction's watershed assessment and restoration program is found to be unacceptable, refer to the Enforcement SOP to determine the appropriate course of action.
Documentation:	<p>Elements of an Effective Watershed Assessments and Restoration Program</p> <p>Table F.1. WMA and SSA Coordinated Timeline for Review of TMDLs and Urban BMPs in Annual Reports: 2015</p> <p>Table F.2. TMDL Implementation Plan Checklist</p> <p>Table F.3. Watershed Assessments and Restoration Plans Screening Log Book</p>
Filing Procedures:	<p>1.0 Save all checklists, forms, and signed correspondence electronically.</p> <p>2.0 Save all checklists, forms, and signed correspondence in the SSDS file cabinet room alphabetically by jurisdiction.</p>
Authorized:	Mr. Brian Clevenger, Program Manager Sediment, Stormwater, and Dam Safety Program
Date:	January 1, 2015

Elements of an Effective Watershed Assessments and Restoration Program

The following is a list of observations that provides evidence of an effective local watershed assessments and restoration program:

- Watershed assessments have been submitted in annual reports for each 8-digit or 12-digit watershed according to an MDE approved schedule.
- An impervious acre baseline has been established using MDE's guidance document.
- BMP implementation schedules for meeting the 20% impervious area restoration requirement are included, concise, and clear.
- Adequate interim restoration benchmarks have been established and met in order for five-year restoration requirements to be met.
- Restoration plans have been developed for each approved stormwater WLA.
- Stormwater WLA baselines, pollutant loads, and the percent reductions to meet target loads have been clearly established.
- Final stormwater WLA completion dates have been proposed.
- A BMP restoration database is comprehensive and complete.
- The rate of BMP implementation is adequate for meeting established benchmarks and schedules.
- BMPs are being constructed properly, construction inspections and reports are being used effectively, and corrections are being made in a timely fashion.
- There is an effective as-built approval process for restoration projects to ensure quality construction of BMPs.
- Restoration BMPs are inspected and maintained once every three years.
- Restoration programs (e.g., street sweeping, catch-basin cleaning) have specific schedules and standard operating procedures that follow MDE guidance.
- Street sweeping and catch-basin cleaning equipment are being maintained and are functioning properly.

Table F.1. WMA and SSA Coordinated Timeline for Review of TMDLs and Urban BMPs in Annual Reports: 2015

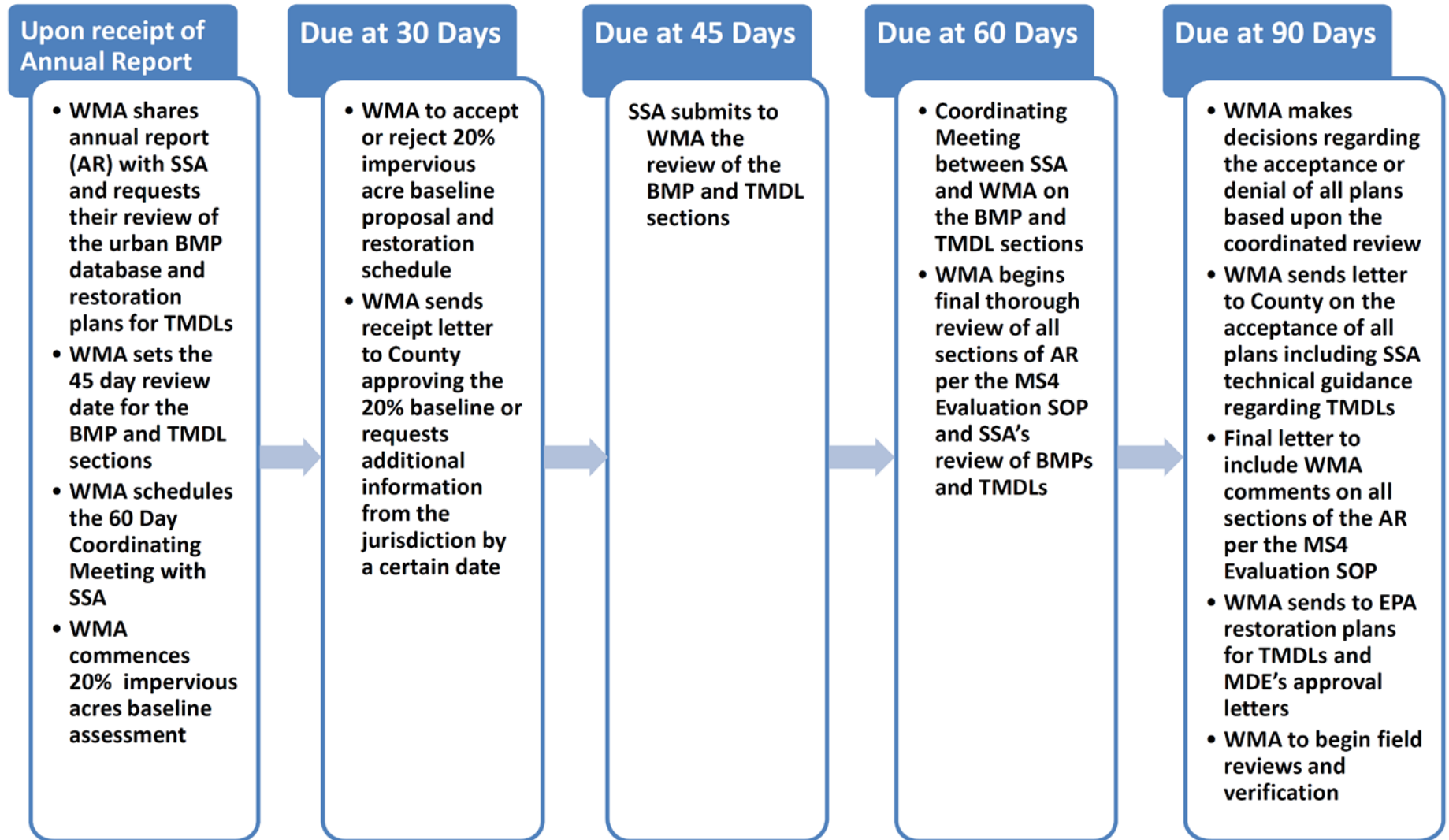


Table F.2. TMDL Implementation Plan Checklist

Jurisdiction Name:

Number of TMDLs
Addressed in Plans:

Submission Date:

In the following categories, a comments box is provided with each question if needed.

Baseline Analysis

Is each TMDL accounted
for in the proposed plans?

Is the baseline year being
used for each TMDL
acceptable?

Did the jurisdiction
enumerate percent
reductions for its TMDLs
(required to meet WLAs)?

Is the jurisdiction's
modeling analysis
acceptable by MDE?

Did the jurisdiction
propose interim
benchmarks (i.e., X year
targets)?

Is the jurisdiction's BMP database complete?

Did the County attempt to take credit for BMPs for BMPs w/missing inspection date (or other data)?

Consistency w/Guidance Document

Did the County use acceptable BMPs as defined in MDE's Guidance?*

**If no, the BMP should not account for more than 10% of the total required load reductions.*

Are pollutant load reductions (in lbs) given for TN, TP and TSS?

Are the credits applied appropriately?

For other pollutants: Does MDE agree with the County's approach?

Schedules and Implementation

Does the jurisdiction have a schedule for BMP implementation (specific locations, drainage areas, % reductions)?

--

If Yes, does the schedule provide specific dates for projects under design, construction, etc. for the next 4 years?

--

Does the schedule seem reasonable (are the goals realistic/attainable)?

--

Does the jurisdiction provide cost estimates for each project and for program implementation?

--

Does the jurisdiction list a final date for meeting the TMDL?

--

Public Participation and Response to Comments

Did the jurisdiction engage in a public process and allow the public a 30-day commenting period?

--

Did the jurisdiction address material comments and put together a formal response?

--

Subsequent Year Implementation Status

Did the jurisdiction address MDE's comments in its year 2 annual report?

--

Is the jurisdiction continually implementing projects on schedule, evaluating & tracking their implementation, and making enhancements as needed to stay on schedule?

--

Table F.3. Watershed Assessments and Restoration Plans Screening Log Book

NPDES Phase I Permits	First Year and Annual Report Screening of Watershed Assessments and Restoration Plans								
	Permit Issue Date	Annual Report Submitted (Date)	MDE Reviewer	Impervious Acre Baseline Proposed (Acres)	Impervious Acre Baseline Approved (Y/N)	Implementation Plans for All Stormwater WLAs Submitted (Y/N)	Implementation Plans for All Stormwater WLAs Approved (Y/N)	Formal MDE Letter Sent Confirming Plans Meet 20% Impervious Area Criteria (Date)	MDE Proposed Field Inspection (Date)
Anne Arundel County	2/9/2014								
Baltimore City	12/27/2013								
Baltimore County	12/23/2013								
Carroll County	7/14/2005								
Charles County	7/31/2002								
Frederick County	3/11/2002								
Harford County	11/1/2004								
Howard County	6/20/2005								
Montgomery County	2/16/2010								
Prince George's County	1/2/2014								
State Highway Administration	10/21/2005								

Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated

Guidance for National Pollutant Discharge Elimination System Stormwater Permits

August 2014



Department of the Environment

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I. Executive Summary

The goals of Maryland's National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer system (MS4) permits are to control stormwater pollution, improve water quality, and work toward meeting water quality standards. The permits require MS4 jurisdictions to perform watershed assessments and develop restoration plans in order to meet stormwater wasteload allocations (WLAs) included in Environmental Protection Agency (EPA) approved total maximum daily loads (TMDLs). These plans provide a schedule for implementing best management practices (BMPs) to reduce pollution and meet water quality standards. This document provides guidance for determining credits granted for BMP implementation to comply with permit requirements.

The MS4 permits establish two specific requirements for developing restoration plans. The first involves restoration of twenty percent of a jurisdiction's impervious surface area that has little or no stormwater management. The impervious area restoration requirement is part of the strategy in Maryland's Watershed Implementation Plan (WIP) for meeting the Chesapeake Bay TMDL. The second requirement is to develop a schedule for BMP implementation to meet all applicable WLAs. Therefore, BMPs implemented to address these permit conditions will help Maryland meet both Chesapeake Bay and local water quality goals. In order to establish consistent criteria for successful implementation across jurisdictions, this guidance:

- Describes how to establish baseline conditions for impervious area restoration and stormwater WLAs.
- Describes how to apply impervious area restoration credits for BMP implementation.
- Describes how to apply pollutant removal credits for BMP implementation for new development, redevelopment, and restoration.
- Expands the list of traditional water quality practices to offer additional options called "alternative BMPs" that may be used for restoration.

BMP Performance Standards

The information in this guidance will incorporate recent recommendations from the Chesapeake Bay Program (CBP) for nutrient and sediment load credits associated with BMP implementation. In order for permittees to receive proper credit toward Chesapeake Bay TMDLs, restoration activities and reporting need to be consistent with CBP approved practices and efficiencies. This will allow Maryland's MS4 community to be consistent with region-wide efforts to meet the Chesapeake Bay TMDL.

BMP performance can be determined using the CBP approved publication, "Recommendations of the Expert Panel to Define Removal Rates for New State Stormwater Performance Standards" (Schueler and Lane, 2012). This offers a series of pollutant removal adjutor curves (see Appendix A) to determine nutrient and sediment load reductions for BMP implementation. BMPs are classified as runoff reduction (RR) and stormwater treatment (ST) practices as outlined in Table 1.E below.

Table 1.E. Classification of BMPs Used in Maryland¹	
Runoff Reduction (RR) Practices	Stormwater Treatment (ST) Practices
All ESD Practices in Manual ² : <ul style="list-style-type: none"> • Alternative Surfaces • Nonstructural Practices • Micro-Scale Practices 	Structural Practices in Manual ² <ul style="list-style-type: none"> • Wet Ponds • Wetlands • Filtering Practices (ex. Bioretention) • Wet Swales
Structural Practices in Manual ² : <ul style="list-style-type: none"> • Infiltration Practices • Bioretention Filters • Dry Swales 	
Note: Structural stormwater management practices that do not meet the performance criteria established in the Manual (e.g., dry detention or extended detention ponds, hydrodynamic structures) may not be used to meet restoration requirements.	

1. Schueler and Lane, 2012

2. 2000 Maryland Stormwater Design Manual, Volumes I & II (MDE, 2000)

The criteria for the RR and ST practices noted above are found in the 2000 Maryland Stormwater Design Manual (Manual). MDE used the adjustor curves in Appendix A to develop Table 2.E, below. The table shows pollutant removal rates for RR and ST practices for commonly used runoff depths.

Table 2.E. Removal Rates for ESD/RR and ST Practices						
Runoff Depth Treated (inches)	TSS		TP		TN	
	ESD/RR	ST	ESD/RR	ST	ESD/RR	ST
0.00	0%	0%	0%	0%	0%	0%
0.25	40%	37%	38%	29%	32%	19%
0.50	56%	52%	52%	41%	44%	26%
0.75	64%	60%	60%	47%	52%	30%
1.00	70%	66%	66%	52%	57%	33%
1.25	76%	71%	70%	55%	60%	35%
1.50	80%	74%	74%	58%	64%	37%
1.75	83%	77%	77%	61%	66%	39%
2.00	86%	80%	80%	63%	69%	40%
2.25	88%	83%	82%	65%	71%	41%
2.50	90%	85%	85%	66%	72%	42%
Note: Where runoff reduction or ESD practices are used, or other acceptable RR practices predominate, the ESD/RR curves should be used. Otherwise, the stormwater treatment or ST curves should be used.						

BMP Implementation and Restoration Credits

The list of practices defined in Chapters 3 and 5 of the Manual (shown in Table 1.E) are considered acceptable water quality treatment BMPs for addressing restoration requirements in MS4 permits. The objective for restoration design is based on treating the water quality volume (WQ_v), or 1 inch of rainfall, using the criteria for BMPs defined in the Manual. Table 2.E may be used to determine pollutant removal rates for a given restoration project based on the runoff depth treated. The 1 inch runoff depth is highlighted in the table as this generally correlates with the WQ_v. Impervious area treatment credits are granted for the total impervious area within the drainage area when the full WQ_v is provided. When less than 1 inch of rainfall is treated, impervious area treatment credit will be based on the proportion of the full WQ_v treated.

Alternative BMPs

In addition to the BMPs identified in the Manual, there are a number of other practices that can provide water quality benefits and many local jurisdictions have data to validate their performance. These practices are called “alternative BMPs” and offer jurisdictions additional options and greater flexibility toward meeting restoration requirements outlined in MS4 permits. The list of acceptable alternative BMPs and their associated pollutant load efficiencies and impervious acre equivalents are provided in Table 3.E. MS4 jurisdictions may use the pollutant reduction efficiencies and impervious acre equivalents for alternative BMPs in Table 3.E to show progress toward meeting the twenty percent impervious area restoration requirement and toward meeting stormwater WLAs.

Reporting and Maintenance

NPDES stormwater permits require that a database be maintained of all stormwater BMPs implemented for new development, redevelopment, and restoration. The Urban BMP database structure is outlined in Appendix B. Data for TMDL and impervious acre credits will be noted for each BMP. The database also contains information regarding inspection and maintenance. Regular maintenance shall occur for all BMPs once every 3 years and each jurisdiction shall implement appropriate actions and document that any deficiencies are rectified. Otherwise, the credits will be removed until proper performance is verified. Therefore, proper reporting and ongoing BMP inspection and maintenance are essential for compliance with NPDES permit requirements.

New Research and CBP Expert Panels

This guidance also incorporates recent recommendations from the CBP expert panels for stream restoration and homeowner BMPs. Other expert panels on shoreline management and illicit discharge are nearing final recommendations and CBP approval. In addition, Maryland’s MS4 community continues to monitor new and innovative approaches for water quality treatment. Restoration in the urban environment offers unique challenges and MDE recognizes the need for flexibility and adaptive management for site specific planning. MDE will work with all MS4 permittees to accommodate new ideas and innovative technology for managing stormwater and improving water quality. As new research and information is developed by the MS4 community, the CBP, and others, MDE will make that information available and periodically update this guidance as needed.

Table 3.E. Alternative Urban BMPs

	Notes	Efficiency Per Acre			Impervious Acre Equivalent
		TN	TP	TSS	
Mechanical Street Sweeping	High density urban areas where sweeping occurs 2x/month	4%	4%	10%	0.07
Regen/Vacuum Street Sweeping	High density urban areas where sweeping occurs 2x/month	5%	6%	25%	0.13
Reforestation on Pervious Urban	Survival rate of 100 trees/acre or greater; at least 50% of trees have two inch diameter or greater (4.5 ft. above ground)	66%	77%	57%	0.38
Impervious Urban to Pervious	Remove pavement and provide vegetative cover for 95% of area	13%	72%	84%	0.75
Impervious Urban to Forest	Survival rate of 100 trees/acre or greater; at least 50% of trees have two inch diameter or greater (4.5 ft. above ground)	71%	94%	93%	1.00
Regenerative Step Pool Storm Conveyance (SPSC) ¹	Located in dry or ephemeral channels; nutrient removal and impervious area credit is based on runoff depth treated	57%	66%	70%	1.00
		Lbs Reduced / Ton			Impervious Acre Equivalent
		TN	TP	TSS	
Catch Basin Cleaning	High density urban areas; storm drains are routinely maintained	3.5	1.4	420	0.40
Storm Drain Vacuuming	High density urban areas; storm drains are routinely maintained	3.5	1.4	420	0.40
Mechanical Street Sweeping	High density urban areas where sweeping occurs 2x/month	3.5	1.4	420	0.40
Regen/Vacuum Street Sweeping	High density urban areas where sweeping occurs 2x/month	3.5	1.4	420	0.40
		Lbs Reduced / Linear Ft			Impervious Acre Equivalent
		TN	TP	TSS	
Stream Restoration: load reductions for interim rate ²	Schueler and Stack (2014) specify qualifying conditions and protocols to calculate individual load reductions per project	0.075	0.068	15/45	0.01
Outfall Stabilization	Stabilization or repair of localized areas of erosion below a storm drain outfall; max credit is 2 acres per project	n/a	n/a	n/a	0.01
Shoreline Management ³	Revised protocols are pending CBP approval	0.075	0.068	137	0.04
		Lbs Reduced / Unit			Impervious Acre Equivalent
		TN	TP	TSS	
Septic Pumping	Pumping system is maintained and verified for annual credit	0 ⁴	0	0	0.03
Septic Denitrification	Permanent credit for installing enhanced septic denitrification	0 ⁴	0	0	0.26
Septic Connections to WWTP	Permanent credit for septic system connected to a WWTP	0 ⁴	0	0	0.39

1. Efficiencies and impervious acre equivalents shown are based on treating 1 inch of rainfall. When less than 1 inch of rainfall is treated, then refer to Table 2 for impervious acre equivalent and Table 6 for nutrient and sediment removal efficiencies.
2. Load reductions are based on current proposal under consideration by CBP. TSS is based on coastal plain and non-coastal plain applications. (Refer to Appendix E, Stream Restoration).
3. Load reductions are based on current proposal under consideration by CBP based on Drescher and Stack (2014). (Refer to Appendix E, Shoreline Management).
4. Actual load reductions shall be reported through local health department. Septic system credits only apply to impervious acre requirements.