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Section 1 - BMP Manual Overview

A brief background on the locally implemented federally mandated Stormwater Programs and explanation of the purpose of this Manual.

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- 1.5 Introduction
- 1.6 BMP Manual Contacts

Section 2 – Local Requirements

Stormwater requirements may vary based on location and local ordinance. Requirements are divided into construction and post-construction (permanent) BMPs.

- 2.1 Chattanooga
- 2.2 Collegedale
- 2.3 East Ridge
- 2.4 Hamilton County
- 2.5 Lakesite
- 2.6 Lookout Mountain
- 2.7 Red Bank
- 2.8 Ridgeside
- 2.9 Signal Mountain
- 2.10 Soddy-Daisy

Section 3 – BMP Selection Guidelines (for Construction and Permanent BMP Design)

Selecting the right BMPs for expected rain events and subsequent runoff rates is crucial to BMP effectiveness. 3.7 BMP Selection Quick Links lists recommended BMPs for specific projects.

- 3.1 BMP Selection Guidelines (includes removal efficiencies)
- 3.2 Stormwater Pollution Prevention Plan (SWPPP)
- 3.3 1st Flush/Water Quality Requirement
- 3.4 Peak Flow Calculations (Permanent Basins)
- 3.5 Acceptable Peak Flow and Detention Design Software
- 3.6 Discharges in Impaired or High Quality Watersheds
- 3.7 BMP Selection Quick Links
 - 3.7.1 Borrow and Fill Sites
 - 3.7.2 Industrial Development
 - 3.7.3 Landscaping
 - 3.7.4 Limited Space Development
 - 3.7.5 Maintenance of BMPs
 - 3.7.6 Rainfall Measurement
 - 3.7.7 Residential Subdivision
 - 3.7.8 Single Family/Duplex Residential Construction
 - 3.7.9 Small Commercial Development (5 acres or less)

Section 4 – Sediment Control

When storm events cause sediment and contaminant laden waters to begin to migrate off-site, these temporary BMPs help keep contaminants on-site, preventing them from entering the stormwater system and moving into local streams and lakes.

- 4.1 Check Dam (CD)
- 4.2 Compost Filter Berms (CFB)
- 4.3 Compost Filter Socks (CFS)
- 4.4 Construction Exit (CE)
- 4.5 Filter Ring (FR)
- 4.6 Inlet Protection (IP)
- 4.7 Outlet Protection (OP)
- 4.8 Sediment Basin (SB)
- 4.9 Sediment Dewatering (SD)
- 4.10 Sediment Trap (ST)
- 4.11 Silt Fence (SF)
- 4.12 Single Family/Duplex Residential (SFDR)

Section 5 – Site Stabilization

These BMPs focus on getting the land disturbance area stabilized as quickly and efficiently as possible.

- 5.1 Barriers (Bar)
- 5.2 Channel Stabilization with Basic Flow Calculations (CH)
- 5.3 Geotextile (GE)
- 5.4 Gradient Treatment/Terracing (GT)
- 5.5 Matting (MA)
- 5.6 Mulching (MU)
- 5.7 Polyacrylamide (includes Flocculents) (PAM)
- 5.8 Riprap (RR)
- 5.9 Seeding (SEED)
- 5.10 Slope Drain (SD)
- 5.11 Sodding (SOD)
- 5.12 Surface Roughening (SR)
- 5.13 Top Soil Conservation (TSC)

Section 6 – Improved Practices (Site Management)

These are improved site management practices, especially for larger land disturbance sites where there is greater potential for higher volumes of contaminated runoff.

- 6.1 Concrete Washout (CoW)
- 6.2 Construction Sequence
- 6.3 Equipment Washing and Maintenance (EWM)
- 6.4 Diversion Channel (DI)
- 6.5 Tree and Ground Cover Retention (TG)

Section 7 – Permanent Basins

Well-maintained basins keep large volumes of sediment and other pollutants out of receiving water bodies. They are often used to meet 1st Flush Requirements.

- 7.1 Dry Detention Basin (DDB)
- 7.2 Underground Detention (UgB)
- 7.3 Wet Detention Basin (WDB)

Section 8 – Filters

These BMPs give specific water quality treatment and are often used to compliment other BMPs.

- 8.1 Floatables Skimmer (aka. Oil/Water Separator) (FS)
- 8.2 Media-Sand Filter (MeF)

Section 9 – Low Impact Designs

To ensure long-term higher quality stormwater runoff after the project is complete, these BMPs can be esthetically pleasing and improve property value.

- 9.1 Bio-retention Basin/Rain Garden (RaG)
- 9.2 Buffer Zone (BuZ)
- 9.3 Conservation Easement (CoE)
- 9.4 Constructed Wetland (CW)
- 9.5 Filter Strips and Swale (FSS)
- 9.6 Green Roofs (GR)
- 9.7 Level Spreader (LeS)
- 9.8 Porous Pavement (PoP)
- 9.9 Steep Slope Management (SSM)

Section 10 – Limited Space Devices (and other Proprietary Devices)

These permanent devices function in limited space. However, based on pollutants of concern, expected runoff flow rates and maintenance access, careful consideration must be given to selection of the appropriate device. **Note: Inclusion of these proprietary units in this manual does NOT constitute an endorsement of the manufactured device, its performance or efficiency.**

- 10.1 Proprietary Devices
 - 10.1.1 AquaShield
<http://www.aquashieldinc.com/>
 - 10.1.2 BaySaver
<http://www.baysaver.com/>
 - 10.1.3 Crystalstream Water Quality Vault
<http://www.crystalstream.com/>
 - 10.1.4 CSPi Design of Underground Detention Systems for Stormwater Management:
<http://www.cspi.ca/english/documents/CSPIDetManual.pdf>
 - 10.1.5 CULTEC chambers
http://cultec.com/stormwater_systems.html
 - 10.1.6 Downstream Defender
<http://www.hydro-international.biz/stormwater/downstream.php>
 - 10.1.7 Filterra Stormwater Bioretention Filtration System:
<http://filterra.com/>
 - 10.1.8 Flo-Gard Dual-Vortex Hydrodynamic Separator
<http://www.wateronline.com/content/productshowcase/product.asp?docid=48650a6e-7d40-44a8-bdcd-994beead5927&VNETCOOKIE=NO>
 - 10.1.9 Proprietary Stormwater Quality Units Selection Guide (City of Nashville)
ftp://ftp.nashville.gov/web/stormwater/2006SWMM/WQUnits_2006.pdf
 - 10.1.10 Stormceptor
<http://www.stormceptor.com/>
 - 10.1.11 Suntreetech Baffle Box
http://www.suntreetech.com/baffle_box/

- 10.1.12 Vortechs
http://www.contech-cpi.com/stormwater/products/hydrodynamic_separation/vortechs/72

Section 11 – Landscaping References

Establishing permanent ground cover and other vegetation is often the very effective erosion and sediment control.

- 11.1 Landscaping with Native Plants
- 11.2 Pesticide, Herbicide and Fertilizer Usage Guidance – City of Chattanooga
- 11.3 Selecting, Establishing and Maintaining Fescues
- 11.4 Tree Protection BMPs for Contractors and Builders
- 11.5 What Works Where It's Wet (Flower)

Section 12 - Maintenance Checklists

The checklists are invaluable tools. Checklists used by the local programs for land disturbance permit inspections are included. Using checklists will enhance efforts to maintain compliance with the local, state and federal stormwater rules and regulations.

- 12.1 BMP Maintenance Guidelines and Inspection Checklists
- 12.2 Stormwater (Detention/Water Quality) Structures Inspection Checklist
- 12.3 Maintenance of Detention Devices:
http://www.chattanooga.gov/Files/CD-swppp_inspection-form.doc
- 12.4 Example Permanent Maintenance Agreements
 - 12.4.1 Chattanooga
 - 12.4.2 Hamilton County
- 12.5 Sample Inspection Form:
http://www.epa.gov/npdes/pub/sw_swppp_inspection_form.doc

Section 13 – “How-to” Photos (for Highly Recommended BMPS)

Clear examples of what to do and what not to do.

- 13.1 Buffer Zone (BuZ)
- 13.2 Check Dam (CD)
- 13.3 Construction Exit/Entrance (CE)
- 13.4 Construction Sequence (CS)
- 13.5 Mulching (MU)
- 13.6 Sediment Basin (SB)
- 13.7 Sediment Trap (ST)
- 13.8 Seeding (SEED)
- 13.9 Silt Fence (SF)
- 13.10 Surface Roughening (SR)

Section 14 – References

References used throughout the manual are listed in the acknowledgements and/or below. Many other references were used to develop specific sections of the manual and are referenced within those sections.

ASTM. 2007. ASTM Standards on Erosion and Sediment Control Technology: 2nd Edition (Print).

Gordon England and Stuart Stein. July 2007. Selection, Maintenance, and Monitoring of Stormwater BMPs. ISBN# 978-0-9707687-7-3.
http://www.foresterpress.com/fps_swbmps.html

- Knoxville (City of). October 2007. Knoxville Stormwater Engineering Division. City of Knoxville BMP Manual. [http://www.ci.knoxville.tn.us/engineering/bmp manual/](http://www.ci.knoxville.tn.us/engineering/bmp%20manual/)
- Minton, Gary, Ph.D., P.E. 2005. Stormwater Treatment: Biological, Chemical & Engineering Principles.
- Tennessee, Department of Transportation (TDOT). 03-15-07(Updated). Design Division Drainage Manual.
[http://www.tdot.state.tn.us/Chief Engineer/assistant engineer design/design/DrainManChap%201-10.htm](http://www.tdot.state.tn.us/Chief%20Engineer/assistant%20engineer/design/design/DrainManChap%201-10.htm).
- USEPA. (United States Environmental Protection Agency). March 5, 2007. “Green infrastructure Memo”.
- USEPA, Office of Wastewater Management (OWM). “National Menu of Stormwater Best Management Practices”.
- USEPA, Stormwater Best Management Practice Design Guide, Volume 1, General Considerations.
<http://www.epa.gov/nrmrl/pubs/600r04121/600r04121.pdf>.

Section 15 - Website Links

- Center for Watershed Protection: http://www.cwp.org/stormwater_mgt.htm (includes National Pollutant Removal Performance Database, Version 3, September 2007.
http://www.cwp.org/Downloads/bmpwriteup_092007_v3.pdf)
- EPA BMP Guidance.
<http://cfpub1.epa.gov/npdes/stormwater/menuofbmps/index.cfmHelpful>
- EPA, Office of Wastewater, National Menu of Stormwater Best Management Practices.
<http://cfpub1.epa.gov/npdes/stormwater/menuofbmps/index.cfm>
- EPA SWPPP Guidance.
http://www.epa.gov/npdes/pubs/sw_swppp_guide.pdf
- EPA Urban BMP Performance Tool
<http://cfpub.epa.gov/npdes/stormwater/urbanbmp/bmpeffectiveness.cfm>
- Engineering News-Record Article, Green Roof Study.
<http://enr.construction.com/news/buildings/archives/070416.asp>
- International Stormwater Best Management Practices (BMP) Database.
<http://www.bmpdatabase.org/>
- NOAA Weather Observations for the Past Three Days – Chattanooga, Lovell Field.
<http://www.srh.noaa.gov/data/obhistory/KCHA.html>
- NOAA National Weather Service Enhanced Radar Image – Storm Total Precipitation and other maps, Huntsville Radar (shows Chattanooga).
<http://radar.weather.gov/radar.php?rid=htx&product=N0R&overlay=11101111&loop=no>
- TDEC Erosion and Sediment Control Handbook.
http://www.state.tn.us/environment/wpc/sed_ero_controlhandbook/
- TDEC’s EPA-Approved TMDLs Arranged by Watershed.
[http://tennessee.gov/environment/wpc/tmdl/approved .shtml](http://tennessee.gov/environment/wpc/tmdl/approved.shtml)
- TDOT Design Division Drainage Manual.
[http://www.tdot.state.tn.us/ChiefEngineer/assistantengineerdesign/design/DrainManChap %201-10.htm](http://www.tdot.state.tn.us/ChiefEngineer/assistantengineerdesign/design/DrainManChap%201-10.htm)

Section 16 – Local Requirements Links

Chattanooga (City of)

Land Disturbing Activities:

- Land Development Office-Land Disturbing
http://www.chattanooga.gov/Public_Works/70_LandDisturbing.htm
- Land Disturbing Permit (LDP)
http://www.chattanooga.gov/Files/Land_Disturbing_permit.pdf
- Land Disturbing Permit (LDP) Application Guideline
http://www.chattanooga.gov/Public_Works/70_GuidelinesTurnDowns.htm
- Land Disturbing “Dos and Don’ts”
http://www.chattanooga.gov/Files/CD-construction_site_do.htm

Stormwater City Code Article VIII:

[%20Chapter%2031%20SEWERS,%20MAINS%20AND%20DRAINAGE.pdf](#)

Stormwater Construction Inspection

http://www.chattanooga.gov/Public_Works/70_DevelopmentInspectionServices.htm

Stormwater Hydrology and Treatment-Summary Sheet

http://www.chattanooga.gov/Files/SW_City_FORM.xls

Stormwater Monthly Inspection Report and Certification Form

<http://www.chattanooga.gov/Files/CD-MONTHLYInspection2.pdf>

Stormwater Requirements for Single and/or Two-Family Residence Construction

<http://www.chattanooga.gov/Files/CD-RequirementsSingle-TwoFamilyConstruction.doc>

Hamilton County Water Quality Program

Stormwater Requirements for Single and/or Two-Family Residence Construction

<http://www.hamiltontn.gov/stormwater/>

Water Quality Homepage

<http://www.hamiltontn.gov/stormwater/>

Signal Mountain (Town of)

Signal Mountain Homepage

<http://www.signalmtntown.org/>