

# **STORMWATER MANAGEMENT ORDINANCE**

**ORDINANCE NUMBER 110512**

**ENACTED NOVEMBER 5, 2012  
EFFECTIVE NOVEMBER 10, 2012**

**FAIRFIELD TOWNSHIP  
LYCOMING COUNTY, PENNSYLVANIA**

**ORDINANCE NUMBER 110512**

**Fairfield Township  
Lycoming County, PENNSYLVANIA**

REGULATING, RESTRICTING, AND DETERMINING THE RATE AND METHOD OF MANAGING STORMWATER RUNOFF RESULTING FROM THE DEVELOPMENT, USE, AND ALTERATION OF LAND; REQUIRING PLANS AND OTHER INFORMATION TO BE SUBMITTED FOR MUNICIPAL REVIEW AND APPROVAL OF SUCH METHODS; PROVIDING FOR THE ADMINISTRATION AND ENFORCEMENT OF THE ORDINANCE.

WHEREAS The Second Class Township Code, the Pennsylvania Municipalities Planning Code, and Act 167 (The Pennsylvania Stormwater Management Act of October 4, 1978) empower Fairfield Township to enact a stormwater management ordinance and to provide for its administration, enforcement, and amendment; and

WHEREAS, difficulties or deficiencies related to existing stormwater management practices promoted the writing of this Ordinance; and

WHEREAS, Fairfield Township desires to minimize or eliminate future stormwater related problems; and

NOW, THEREFORE BE IT ENACTED AND ORDAINED, by Fairfield Township, Lycoming County, Pennsylvania and it is hereby ENACTED and ORDAINED by the authority of the same as follows:

**ARTICLE I  
GENERAL PROVISIONS**

**SECTION 1. SHORT TITLE:** This Ordinance shall be known, and may be cited, as the “Fairfield Township Stormwater Management Ordinance.”

**SECTION 2. AUTHORITY:** The Second Class Township Code, as amended, empowers Townships of the Second Class to enact stormwater management ordinances; and to regulate activities that affect public health, safety, and welfare. Act 247 of July 31, 1968, the Pennsylvania Municipalities Planning Code, as amended, authorizes the governing body of each municipality to regulate development within the municipality. In addition and where applicable, Act 167 of October 4, 1978, the Stormwater Management Act, authorizes the regulation of land and water use for flood control and stormwater management purposes, imposing duties and conferring powers on the Pennsylvania Department of Environmental Protection, municipalities, and counties.

**SECTION 3. STATEMENT OF FINDINGS:** The Fairfield Township Board of Supervisors finds that:

- 3.1** Federal and State regulations require this municipality to obtain a permit for discharges from its MS4 and to implement a program of stormwater controls.
- 3.2** Inadequate maintenance of stormwater best management practices (BMPs) causes loss of water quality, flooding, and other problems.
- 3.3** A program of reasonable regulation of connections and discharges to municipal stormwater management facilities will be beneficial.
- 3.4** Stormwater is an important resource.

**SECTION 4. PURPOSE:** This Ordinance is enacted for the following purposes:

- 4.1** To manage accelerated stormwater runoff problems at their source by regulating activities which cause such problems, to utilize and preserve desirable existing natural drainage systems, to encourage recharge of groundwater, to prevent the deterioration of groundwater quality, to maintain the existing flows and quality of streams and watercourses in the Municipality, to preserve and restore the flood carrying capacity of streams, to meet NPDES MS4 permit requirements, to meet State water quality requirements, to reduce accelerated erosion, to reduce scour, to reduce aggradation and degradation, and to provide procedures and

standards for proper operation and maintenance of stormwater management BMPs;

- 4.2 To provide minimum standards for the design, installation, and maintenance of all permanent stormwater management structures constructed in the Municipality;
- 4.3 To assure, at a minimum, that the peak rate of stormwater runoff (peak discharge) is no greater after development than prior to development within the Municipality;
- 4.4 To minimize danger to public health and safety and damages to property by providing for management of stormwater runoff.

**SECTION 5. APPLICABILITY:** This Ordinance shall apply to:

- 5.1 All activities involving the alteration or development of land that may impact stormwater runoff characteristics;
- 5.2 All activities related to proper operation and maintenance of stormwater management facilities and BMPs;
- 5.3 All activities that may contribute non-stormwater discharges to the municipality's regulated small MS4;
- 5.4 The installation of stormwater systems or appurtenances thereto.

**SECTION 6. SEVERABILITY:** Should any section or provision of this Ordinance be declared invalid by a court of competent jurisdiction, such decision shall not affect the validity of any of the remaining provisions of this Ordinance.

**SECTION 7. COMPATIBILITY:** Permits and approvals issued pursuant to this Ordinance do not relieve the Applicant/Developer of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act, or ordinance.

**SECTION 8. ERRONEOUS PERMIT:** Any permit or authorization issued or approved based on false, misleading, or erroneous information provided by an applicant is void without the necessity of any proceedings for revocation. Any work undertaken or use established pursuant to such permit or other authorization is unlawful. No action may be taken by a board, agency or employee of the Municipality purporting to validate such a violation.

**SECTION 9. DEFINITIONS:** Definitions of terms used in this Article may be found in Article V of this Ordinance.

**SECTION 10. REFERENCES:** Specific methods and publications indicated in this Ordinance shall, in all cases, refer to the latest available edition and include revisions or amendments thereto.

**ARTICLE II**  
**STORMWATER MANAGEMENT PLAN REQUIREMENTS**

**SECTION 1. GENERAL REQUIREMENTS:** From and after the date of enactment of this Ordinance, a Stormwater Management Plan, and other information specified herein, shall be submitted to the Municipality for all Regulated Activities. A Stormwater Management Plan, and other information specified herein, shall be submitted at the same time, and together with submission of a preliminary and/or final subdivision or land development plan, along with a completed checklist supplied by the Municipality indicating the items contained within the submission. The Applicant/Developer and his/her Registered Professional shall schedule a pre-application meeting that shall include representatives from the Municipality and the Municipal Planning Commission, the Municipal Engineer, the Municipal Zoning Officer, the Municipal Building Code Official, the Lycoming County Conservation District, and when required, PA DEP and PA DOT. The Applicant/Developer and his/her Registered Professional are encouraged to schedule the pre-application meeting as early in the design phase as practical.

**CONCURRENT REVIEWS:** Such plans and information shall be considered part of said zoning and subdivision documents, and shall be reviewed in accordance with procedures established thereunder. Preliminary approval and/or final approval of a subdivision or land development plan, and/or the issuance of a zoning permit shall be contingent upon the submission of a Stormwater Management Plan and other materials specified herein, and approval of the Stormwater Management Plan in accordance with provisions of this Ordinance.

**REVIEW BY MUNICIPAL ENGINEER:** All Stormwater Management Plans shall be submitted to the Municipal Engineer for review and comment. Such review shall include a statement by the Municipal Engineer specifying the provisions of this Ordinance which have not been met by the plan as submitted.

**VALIDITY OF APPROVED PLAN:** Once a Stormwater Management Plan has been approved, together with a subdivision or land development plan approval, or together with the issuance of a zoning permit, said Stormwater Management Plan shall be valid only for the subdivision, land development, or zoning permit approved. Any further development on the lot or lots requiring a revision of the approved plan, or other construction or activities, as defined by municipal zoning regulations, shall require the submission of a new, amended, or revised Stormwater Management Plan, and other information specified herein.

**1.1 Exemptions From Plan Preparation:** The following activities may be exempt from the plan preparation and submission provisions of this

Ordinance, but shall remain subject to the minimum design standards and criteria specified in Article III of this Ordinance (and erosion and sediment pollution control requirements):

- 1.1.1** Non-commercial home gardening;
- 1.1.2** Agriculture, when operated in accordance with an approved conservation plan, or erosion and sedimentation control plan;
- 1.1.3** Forest management/timber operations, conducted in accordance with the PA DEP's "Soil Erosion and Sedimentation Control Guidelines for Forestry," and an approved erosion and sediment pollution control plan;
- 1.1.4** Regulated Activity(ies) where the total impervious area associated with such activity(ies) will be less than 5,000 square feet.
- 1.1.5** Regulated Activity(ies) where the Applicant/Developer can satisfactorily demonstrate that downstream property(ies), groundwater, and waters of the Commonwealth will not be harmed if the total impervious area(s) associated with such activity(ies) would exceed 5,000 square feet.

The Municipality and its Engineer shall review all Regulated Activities to determine if the activity or activities may be exempt from the plan preparation and submission provisions of this Ordinance.

In addition to the criteria in this Ordinance subsection, the Municipality and its Engineer may require that Regulated Activities maintain a minimum distance between proposed impervious areas/stormwater management facility outlets and downslope property line(s).

- 1.2** All Regulated Activities that do not fall under the exemption criteria referenced above shall submit a drainage plan to the Municipality for review. These criteria shall apply to the total proposed development, even if development is to take place in stages. Impervious cover shall include, but not be limited to, any roof, parking, or driveway areas; and any new streets and sidewalks. Any areas designed to initially be gravel or crushed stone shall be assumed to be impervious.
  - 1.2.1** Stormwater drainage systems shall be provided in order to permit unimpeded flow along natural watercourses, except as

modified by stormwater management facilities or open channels consistent with this Ordinance.

- 1.2.2** The existing points of concentrated drainage that discharge onto adjacent property shall not be altered without permission of the affected property owner(s), and shall be subject to any applicable discharge criteria specified in this Ordinance.
- 1.2.3** Areas of existing diffused drainage discharge shall be subject to any applicable discharge criteria in the general direction of the existing discharge, whether proposed to be concentrated or maintained as diffused drainage areas, except as otherwise provided by this Ordinance. If diffused flow is proposed to be concentrated and discharged onto adjacent property, the Applicant/Developer must document that adequate downstream conveyance facilities exist to safely convey the concentrated discharge, or otherwise prove that no erosion, sedimentation, flooding, or other harm will result from the concentrated discharge.
- 1.2.4** Where a site is traversed by watercourses, drainage easements shall be provided conforming to the line of such watercourses. The terms of the easement shall prohibit excavation, the placing of fill or structures, and any alterations that may adversely affect the flow of stormwater within any portion of the easement. Maintenance, including mowing of vegetation within the easement, shall be required, except as approved by the appropriate governing authority.
- 1.2.5** When it can be shown that, due to topographic conditions, natural drainageways on the site cannot adequately provide for drainage, open channels may be constructed conforming substantially to the line and grade of such natural drainageways. Work within natural drainageways shall be subject to approval by PA DEP through the Joint Permit Application process, or, where deemed appropriate by PA DEP, through a General Permit or Small Projects Permit.
- 1.2.6** Any stormwater management facilities regulated by this Ordinance that would be located within or adjacent to wetlands or other waters of the Commonwealth shall be subject to approval by PA DEP through the Joint Permit Application process, or, where deemed appropriate by PA DEP, the General Permit process. When there is a question whether wetlands may



be involved, it is the responsibility of the Applicant/Developer, or his agent, to show that the land in question cannot be classified as wetlands, otherwise approval to work in the area must be obtained from PA DEP.

- 1.2.7** Any stormwater management facilities regulated by this Ordinance that would be located on State highway rights-of-way shall be subject to approval by the Pennsylvania Department of Transportation.
- 1.2.8** Minimization of impervious surfaces, and infiltration of stormwater runoff through stormwater infiltration facilities are encouraged where soil conditions permit in order to reduce the size, or eliminate the need for detention facilities.
- 1.2.9** In order to promote overland flow and infiltration, roof drains should not discharge directly to streets or storm sewers. Roof drains may discharge directly to streets or storm sewers when deemed necessary by the Municipality and its Engineer. Under no circumstances shall roof drains discharge directly to sanitary sewer systems.

**SECTION 2. PLAN CONTENT:** The content of the plans shall consist of annotated maps, drawings, engineering plans, and construction details. Said plan shall be prepared by a professional engineer, professional land surveyor, or a registered landscape architect with said preparer's seal and registration number affixed to the plan. Plans for tracts of less than twenty (20) acres shall be drawn at a scale of one inch equals no more than fifty (50) feet; for tracts of twenty (20) acres or more, plans shall be drawn at a scale of one inch equals no more than one hundred (100) feet. Plans shall be submitted on 24-inch by 36-inch sheets. All lettering shall be legible if the plans are reduced to half size. All sheets comprising a submission shall be on one size.

The following minimum information, unless specifically exempted in writing, must be shown on the plans, and prepared in a form that meets the requirements for recording in the Office of the Register and Recorder of Lycoming County, Pennsylvania:

- 2.1** The name of the proposed development, the name and address of the owner of the property and source of title, and the individual or firm preparing the plan;
- 2.2** Date of submission and revision(s);

- 2.3** Graphic scale;
- 2.4** North point;
- 2.5** Total tract boundary with distances marked to the nearest foot, bearings to the nearest degree, and total acreage of the tract;
- 2.6** Key map showing all existing natural and man-made features beyond the property boundary affected by the project, and the extent of the watershed that drains through the project site;
- 2.7** Topographic contours at intervals not greater than five (5) feet for existing and proposed conditions. Topographic contours at intervals less than five (5) feet may be required for flat sites, and to depict certain existing and future stormwater management features. The reference datum used to develop topographic contours shall be either NGVD 1929 or NAVD 1988;
- 2.8** Drainage areas and subareas affecting the site, including areas necessary to determine downstream impacts analysis, where required, for proposed stormwater management facilities;
- 2.9** Existing and proposed use, including the total area of impervious surfaces after construction;
- 2.10** Existing soil types, karst formations, floodplain boundaries, sinkholes, undrained depressions, rock outcrops, streams, drainage courses, wetlands based on existing sources and references, and vegetation;
- 2.11** Complete drainage systems for the site, including details for construction. All existing drainage features which are to be incorporated in the design shall be so identified. If the site is to be developed in stages, a general drainage plan for the entire site shall be presented with the first stage, and appropriate development stages for the drainage system shall be indicated;
- 2.12** Location and selected plant material used for vegetative filter paths to sinkholes, and the location of all notices to be posted, as specified in Article III, Section 2.4 of this Ordinance;
- 2.13** If stormwater management facilities are off-site, a note must be placed on the plan(s) referring to the location of the off-site facility or facilities. Said note must identify the entity or entities that will be responsible for the conveyance to, and maintenance of the off-site facility or facilities. All such off-site facilities shall meet the minimum design standards and

criteria specified in Article III of this Ordinance, and details of the facilities shall be included with the plan;

- 2.14** Proposed easement locations, including drainage, maintenance, and access easements in conformance with Article III, Section 1.13 of this Ordinance;
- 2.15** The following statement by the landowner: “I/we hereby acknowledge that I/we and/or my/our assignees/grantees shall be responsible for maintenance of the stormwater management system shown hereon, in accordance with the approved stormwater management ownership and maintenance plan for this project, and that such stormwater system shall remain as a permanent fixture that cannot be altered, replaced, or removed without prior written approval from Fairfield Township;”
- 2.16** The location of the permanent watercourse that will receive stormwater runoff from the project site;
- 2.17** Complete erosion and sediment pollution control facilities, including details for construction, in accordance with Article III, Section 3 of this Ordinance;
- 2.18** Horizontal and vertical profiles of any existing and proposed channels, culverts, drainageways, storm sewers, streams, or watercourses;
- 2.19** A note indicating that Record (As-Built) drawings will be submitted by the Applicant’s/Developer’s professional engineer or professional land surveyor for all stormwater facilities prior to occupancy, or the release of the surety bond. Fairfield Township reserves the right to authorize the Municipal Engineer to review said Record Drawing;
- 2.20** The following Stormwater Management Design Certification signature block for the Registered Professional preparing the Stormwater Management Plan:

“I, \_\_\_\_\_, hereby certify that the Stormwater Management Plan meets all design standards and criteria of the Fairfield Township Stormwater Management Ordinance.”

**SECTION 3. SUPPLEMENTAL INFORMATION:** In addition to the plan information enumerated in Section 2 of this Article, the following minimum information shall be submitted:

- 3.1** A written description of:

- 3.1.1** The overall project concept;
- 3.1.2** Stormwater runoff computations as specified in Article III, Sections 1.1, 1.2, and 1.3 of this Ordinance, and in accordance with criteria contained in Appendix A of this Ordinance;
- 3.1.3** Hydrologic and hydraulic computations for all existing and proposed stormwater management and conveyance facilities;
- 3.1.4** Stormwater management both during and after development;
- 3.1.5** Expected project time schedule;
- 3.2** The effect of the project on stormwater runoff volume, time to peak flow, and rate of flow on adjacent property, and upon an existing municipal stormwater drainage system when such will be utilized;
- 3.3** Description of all watercourses, impoundments, and wetlands on or adjacent to the site, or into which stormwater flows;
- 3.4** Soils investigation report, including boring logs, compaction requirements, and recommendations for construction of detention basins, when requested by the Municipality or its Engineer;
- 3.5** Karst features identification and analysis reports, and a hydrogeologic assessment of the effects of stormwater runoff on sinkholes, as specified in Article III, Sections 1.8.2, 2.3, and 2.5 of this Ordinance;
- 3.6** A soil erosion and sediment pollution control plan, including all reviews and approvals, as required, by PA DEP and/or Lycoming County Conservation District;
- 3.7** All easements, deed restrictions, covenants, and maintenance measures of the system shall be outlined in an Ownership and Maintenance Program in accordance with Article III, Section 4 of this Ordinance. For stormwater management systems to be dedicated to the Municipality, a maintenance guarantee, as specified by the PA Municipalities Planning Code, may be required by Fairfield Township. The Municipality has the explicit right to reject any Offer of Dedication;
- 3.8** All permits required by the Pennsylvania Department Environmental Protection, the Pennsylvania Department of Transportation, the United States Army Corps of Engineers, and other regulatory agencies.

**ARTICLE III  
DESIGN STANDARDS AND CRITERIA**

**SECTION 1. DESIGN STANDARDS:** All Regulated Activities shall be conducted in conformance with the following minimum standards:

- 1.1** Peak discharges for the 1-, 2-, 10-, 25-, and 100-year recurrence interval design storms from the project site shall not exceed the respective pre-development peak discharges.

Stormwater runoff shall be managed so that no downstream increases in flood damages or impairment of streets and other public facilities occur. The Municipal Engineer may require that downstream impacts be evaluated at critical locations such as dams, tributaries, existing developments, undersized culverts, and floodprone areas. The Municipality and its Engineer shall make the final determination with respect to the degree of management required for any site. The Applicant/Developer shall evaluate the effects of the proposed plan on such critical locations by providing computed water surface elevations (WSEL) for the 10- and 100-year recurrence interval design storms. Methods of computation shall have prior approval of the Municipal Engineer. At such downstream critical locations, stormwater management may be exercised by:

- 1.1.1** Providing off-site improvements to downstream conveyances in order to contain flow increases;

- 1.1.2** Providing downstream drainage easements with sufficient widths to contain the flood limits.

- 1.2** The Municipality and its Engineer may impose stormwater quality measures in accordance with Appendix A, Section IV of this Ordinance to protect against ground or surface water pollution where the type of business or the nature of the stormwater runoff and soils underlying stormwater management facilities would constitute a substantial risk of contamination.

- 1.3** In establishing the watershed conditions for calculating stormwater runoff prior to development, the following assumptions shall apply:

- 1.3.1** Woodland (in good condition) or meadow shall be used for all undeveloped areas.

- 1.3.2** Average antecedent moisture conditions as defined by the Natural Resource Conservation Service shall be used for all areas.
- 1.3.3** Drainage area reductions equal to the area of undrained depressions or pond factor adjustments in accordance with the Urban Hydrology for Small Watersheds, Technical Release No. 55 (TR-55, USDA, NRCS) procedure shall be applied in determining pre-development peak discharges from karst geologic areas.
- 1.4 Hydrologic Methods:** All plans and designs for stormwater management facilities shall be reviewed by the Municipal Engineer. Plans for facilities other than storm sewers should determine stormwater peak discharge and stormwater runoff by the use of the Soil-Cover-Complex Method as set forth in Technical Release No. 55 (TR-55, USDA, NRCS) and Technical Release No. 20 (TR-20, USDA, NRCS), with specific attention given to antecedent moisture conditions, flood routing, and peak discharge specifications included therein, and in the National Engineering Handbook, Part 630 - Hydrology (USDA, NRCS, current edition). The Municipal Engineer may permit the use of the Modified Rational Method or other methods for calculation of the storage capacity of a stormwater management facility from drainage areas of twenty (20) acres or less.
- 1.4.1** Acceptable runoff coefficient values for use in the Rational Method equation, and permissible curve numbers for TR-55 and TR-20 are identified in Tables A-1 through A-2 of Appendix A, Section I of this Ordinance. When applying the Rational Method coefficients in Table A-2, “Open Space” coefficients shall be used for all pre-development pervious areas; and for all undeveloped and undisturbed, densely vegetated (non-forest) areas instead of “Meadow” coefficients.
- 1.4.2** The Rational Method may be used in lieu of the Soil-Cover-Complex Method to compute design flows for the sizing of storm sewers, inlets, and swales. Methods approved by the Pennsylvania Department of Transportation and/or the Pennsylvania Department of Environmental Protection may be used to design the waterway areas of bridges.
- 1.4.3** Design rainfall amounts for the specified recurrence intervals shall be determined using the Precipitation-Frequency Atlas of the United States (NOAA Atlas 14, Volume 2). Rainfall duration for the design of stormwater detention basins shall not

be less than twenty-four (24) hours, unless waived in writing by the Municipality and its Engineer. All hydrologic computations utilizing the Soil-Cover-Complex Method shall use a rainfall duration of not less than twenty-four (24) hours, unless waived in writing by the Municipality and its Engineer. Rainfall distribution shall be SCS Type II, unless waived in writing by the Municipality and its Engineer.

**1.4.4** Time of concentration shall be determined in accordance with methods presented in Chapter 15 of the National Engineering Handbook, Part 630 - Hydrology (USDA, NRCS, current edition).

**1.4.5** In order to reduce stormwater runoff volumes from developed areas, and in order to encourage groundwater recharge, underground basin drains, infiltration trenches, and cisterns are permitted to which roof leaders may be connected. These drains may consist of stone-filled basins which temporarily store and release water below ground surface. Plans for such facilities shall be submitted to the Municipality for approval, and the basins shall be used only in those areas where soils, geologic, and water table conditions permit. Performance criteria which govern the location, design, construction, and maintenance of these infiltration facilities are contained in Appendix A, Section IV of this Ordinance. Suggested guidelines are contained in Standards and Specifications for Infiltration Practices (MD DNR) and Pennsylvania Stormwater Best Management Practices Manual (PA DEP). At a minimum, these infiltration facilities shall be designed to temporarily store a volume of runoff from a 24-hour, 2-year recurrence interval design storm.

**1.5** Stormwater management facilities and related installations shall be provided:

**1.5.1** To permit unimpeded flow of natural watercourses. Such flow may be redirected as required, subject to the approval of the Pennsylvania Department of Environmental Protection and the Municipality;

**1.5.2** To insure adequate drainage of all low points along the curb line of streets;

**1.5.3** To intercept stormwater runoff along streets at intervals reasonably related to the extent and grade of the area drained,

and to prevent substantial flow of water across intersections or flooded intersections during storms, in accordance with the procedures contained in the Design Manual Part 2 - Highway Design, Publication 13M (PA DOT), Chapter 10;

**1.5.4** To insure adequate and unimpeded flow of stormwater under driveways in, near, or across natural watercourses or drainage swales. Suitable pipes or other waterways shall be provided as necessary;

**1.5.5** To properly drain stormwater runoff from all project sites. All lot and open areas shall be designed to drain to the nearest practical street or drainage system, existing or proposed, as defined by the Municipal Engineer, with no impact on adjoining properties, unless an area specifically designed for stormwater detention is provided.

**1.6** Storm sewers and related installations:

**1.6.1** Storm sewers, where required by zoning and land use densities, shall be placed under or immediately adjacent to the roadway side of the curb, or as directed by the Municipality and its Engineer, when parallel to the street within the right-of-way.

When located in undedicated land, they shall be placed within a drainage easement not less than twenty (20) feet wide, as approved by the Municipal Engineer.

The use of properly designed, graded, and turfed drainage swales is encouraged in lieu of storm sewers in commercial and industrial areas, and where approved by the Municipal Engineer, in residential areas. Such swales shall be designed not only to carry the required discharge without excessive erosion, but also to increase the time of concentration, reduce the peak discharge and velocity, and permit the water to percolate into the soil, where appropriate. Criteria related to the use and design of drainage swales are contained in Appendix A, Section II of this Ordinance.

**1.6.2** The design capacity of storm sewers shall be in accordance with Urban Drainage Design Manual, Hydraulic Engineering Circular Number 22 (US DOT, FHA). Storm drainage systems shall be designed without surcharging inlets to provide conveyance of stormwater runoff into a detention basin or similar facility



utilized to manage the rate of stormwater runoff. To avoid surcharging inlets, and to ensure that inlets will receive stormwater runoff, the hydraulic grade line at the inlet should be at least six (6) inches below the elevation of the inlet grate. Where site grading will direct stormwater runoff from the 100-year recurrence interval design storm to a detention basin, or similar facility utilized to manage the rate of stormwater runoff, then the storm sewer may be designed for the 10-year recurrence interval design storm. Where site grading will not direct stormwater runoff from the 100-year recurrence interval design storm to a detention basin, or similar facility utilized to manage the rate of stormwater runoff, then the storm sewer shall be designed for the 100-year recurrence interval design storm. Conveyance of storms to the detention basin, up to and including the 100-year recurrence interval design storm, shall be provided so as not to endanger life or seriously damage property.

**1.6.3** Storm inlet types and inlet assemblies shall conform to the Standards for Roadway Construction, Publication 72M (PA DOT) and the following criteria:

**1.6.3.1** Inlets shall, at a minimum, be located at the lowest point of street intersections to intercept the stormwater before it reaches pedestrian crossings; or at sag points of vertical curves in the street alignment which provide a natural point of ponding of surface stormwater.

**1.6.3.2.** Where the Municipality and its Engineer deem it necessary because of special land requirements, special inlets may be approved.

**1.6.3.3** The interval between inlets collecting stormwater runoff shall be determined in accordance with the Design Manual Part 2 - Highway Design, Publication 13M (PA DOT), Chapter 10, Section 5, "Capacity of Waterway Areas," or Urban Drainage Design Manual (HEC-22, US DOT, FHA).

**1.6.3.4** In curbed sections, the maximum encroachment of water on the roadway pavement shall not exceed half of a through traffic lane or one (1) inch less than the depth of curb during the 10-year recurrence interval design storm. Inlets shall be provided to limit the

encroachment of water on the pavement. When inlets are used in a storm system within the right-of-way limits of a street in lieu of manholes, the spacing of such inlets shall not exceed the maximum distance of four hundred fifty (450) feet.

**1.6.3.5** The design of storm inlets shall be in accordance with Drainage of Highway Pavements, Hydraulic Engineering Circular Number 12, (US DOT, FHA).

**1.6.4** Accessible drainage structures shall be located on a continuous storm sewer system at all vertical dislocations, at all locations where a transition in storm sewer pipe sizing is required, at all vertical and horizontal angle points exceeding five (5) degrees, and at all points of convergence of two or more influent storm sewers.

**1.6.5** When evidence available to the Municipality and its Engineer indicates that existing storm sewers have sufficient capacity, as determined by hydrograph summation, and where such existing storm sewers are accessible, proposed stormwater facilities may connect to these existing storm sewers as long as the peak rate of discharge does not exceed the amount permitted by Section 1.1 of this Article.

**1.7** Bridges and culverts shall have ample waterway to carry expected flows, based on the following minimum design storms: 10-year recurrence interval for driveways; 25-year recurrence interval for local streets; 50-year recurrence interval for collector streets; and 100-year recurrence interval for arterials; or as otherwise required by the Municipality and its Engineer.

Bridge and/or culvert construction shall be in accordance with Pennsylvania Department of Transportation specifications.

**1.7.1** The design criteria contained in this Article are intended for use in conjunction with the Chapter 105 Regulations of PA DEP entitled, "Water Obstructions and Encroachments." All information and regulations contained in Chapter 105 shall be considered to be incorporated into this Article as if reproduced in full.

A PA DEP permit in accordance with Chapter 105 shall be required for any obstruction or encroachment in regulated waters

of the Commonwealth, prior to the approval of the Stormwater Plan. All areas of the Municipality shall be classified as rural, suburban, or urban, as determined by the Municipality and its Engineer (See PA DEP Section 105.161 for bridge and culvert designs). In the event any question or conflict arises between this Article and the PA DEP Chapter 105 Regulations, the design criteria contained in the PA DEP regulations shall govern.

- 1.7.2** Refer to Appendix A, Section II of this Ordinance for additional design criteria.
- 1.8** Detention or retention basins for the management of stormwater peak discharges shall meet the following requirements:
  - 1.8.1** Basins shall be installed prior to, or concurrent with any earthmoving or land disturbances which they will serve. The phasing of their construction shall be noted in the narrative and on the plan.
  - 1.8.2** The design of all facilities over limestone formations shall include measures to prevent groundwater contamination, and where required, sinkhole formation. Soils used for the construction of basins shall have moderate to low erodibility factors (i.e. “K” factors of 0.32 or less).
  - 1.8.3** Energy dissipaters and/or level spreaders shall be installed at points where pipes or drainageways discharge to or from basins.
  - 1.8.4** Outlet structures within stormwater detention basins shall incorporate childproof, non-clogging trash racks or grates over all horizontally oriented openings. All vertically oriented openings over twelve (12) inches or larger in any dimension where entry by a child could cause injury or death shall be covered with childproof, non-clogging trash racks, except where such openings carry perennial stream flows. Design openings less than six (6) inches in any dimension shall be covered with a pipe screen (e.g. Neenah R-7512 or equivalent). Measures to completely drain stormwater detention basins in the event of clogging of the primary design opening(s) shall be incorporated into the design of basin outlet structures. Basin outlet pipes shall have a minimum inside diameter of fifteen (15) inches (or a cross-sectional area of 176 square inches), except that pipes under twenty-five (25) feet or greater fill shall not be less than

twenty-four (24) inches (or a cross-sectional area of 453 square inches), and shall be reinforced concrete pipe.

Outlet aprons shall be designed and shall extend, at a minimum, to the toe of the basin slope. Where spillways will be used to manage peak discharges in excess of the 10-year recurrence interval design storm, such spillways shall be constructed to withstand the pressures of impounded waters, and convey flows at computed outlet velocities without erosion.

Stormwater facilities shall be designed to release their total volume within the following maximum time periods:

Roofs and Parking Lots - 24 hours.

Detention Basin - 48 hours.

Infiltration Facilities - 72 hours.

**1.8.5** When the Pennsylvania Department of Environmental Protection requires facilities to be permitted, the designer shall submit all information to the PA DEP Regional Office, and obtain all necessary approvals and permits pursuant to Pennsylvania Code, Title 25, Chapter 105, Dam Safety and Encroachment Act.

**1.8.6** Downstream Analysis:

**1.8.6.1** Where deemed necessary by the Municipality and its Engineer, the Applicant/Developer shall submit an analysis of the impacts of detained stormwater flows on downstream areas within the watershed. The analysis shall include hydrologic and hydraulic calculations necessary to determine the impact of peak discharge modifications on critical locations such as dams, tributaries, existing developments, undersized culverts, and floodprone areas.

**1.8.6.2** Review and comment of the analysis by the Engineer of a downstream Municipality shall be obtained as deemed necessary.

**1.8.7** Detention basins may be waived by the Municipality and its Engineer at sites in close proximity to large receiving streams, depending on the hydrology of the watershed. It shall be incumbent upon the Applicant/Developer to demonstrate that no downstream increase in stream flooding or channel erosion will

result, in accordance with Section 1.8.6 of this Article, and that no increases in peak discharge within the receiving stream will occur, as outlined under Section 1.1 of this Article.

- 1.8.8** Multiple-Use Basins: The design and construction of multiple-use stormwater detention facilities are strongly encouraged. In addition to stormwater management, multiple-use basins, where appropriate, allow for recreational uses including: ballfields, play areas, picnic grounds, etc. Provisions for parking facilities within basins and permanent wet ponds with stormwater management capabilities may also be appropriate. Prior approval and consultation with the Municipality and its Engineer are required before design. Multiple-use basins should be constructed so that potentially dangerous conditions are not created.
  - 1.8.9** Multiple Development Basins: Stormwater management facilities designed to serve more than one property or development in the same watershed are encouraged. Staged construction of existing or proposed multiple-use detention facilities by several Applicants/Developers within the watershed development is encouraged. Each Applicant/Developer shall be responsible for the incremental increase in stormwater runoff generated by the respective development, and incremental construction improvements necessary for the overall detention facility. Prior approval and consultation with the Municipality and its Engineer is required before design of such facilities.
  - 1.8.10** Alternative Detention Facilities: Alternative stormwater detention facilities including roof top storage, subsurface basins or tanks and in-pipe detention storage, or other approved alternative designs that may be permitted by the Municipality and its Engineer are encouraged.
  - 1.8.11** Specific criteria related to the design of detention basins is contained in Appendix A, Section III of this Ordinance.
- 1.9** All calculations shall be submitted to the Municipal Engineer on computation sheets for approval. If the Municipal Engineer determines through review and independent computation that the size(s) of storm pipes or detention basins is insufficient, the Municipality and its Engineer may require the Applicant/Developer to increase the size(s) of said storm pipes or detention basins.

If the storm drainage system design is completed using computer software, sufficient supporting data shall be provided to allow comprehensive review by the Municipality and its Engineer.

- 1.10** When the elevation of any existing or proposed entrance to a structure, including windows, is lower than the elevation of the public cartway serving that site, a grading plan shall be submitted to the Municipality for review and approval as part of the zoning permit process for the proposed structure.
- 1.11** Natural drainageways shall be utilized to the maximum extent possible in carrying stormwater runoff.
- 1.12** Stormwater management facilities located outside of an existing or proposed public right-of-way shall be located within and accessible by easements as follows:
  - 1.12.1** Drainage Easements: Where a tract is traversed by a watercourse, drainageway, channel, or stream, a drainage easement shall be provided that parallels the line of such watercourse, drainageway, channel, or stream. The width of the drainage easement shall be adequate to preserve the unimpeded flow of natural drainage in the regulatory floodplain, in accordance with computed top widths for water surface elevations determined under Section 1.1 of this Article.

Drainage easements shall provide for maintenance, and for the purpose of widening, deepening, improving, or protecting such drainage facilities.
  - 1.12.2** Access Easements: Where proposed stormwater management facilities will not be adjacent to an existing or proposed public right-of-way, or where they will not be accessible due to physical constraints, a twenty (20) feet wide passable access easement specifying rights of entry shall be provided. Access easements shall provide for vehicle ingress and egress on grades of less than ten (10) percent for carrying out inspection or maintenance activities.
  - 1.12.3** Maintenance Easements: A maintenance easement shall be provided which encompasses the stormwater facility and appurtenances, and provides for access for maintenance purposes. The maintenance easement must be located at least

twenty (20) feet outside of the stormwater facility and its appurtenances.

- 1.12.4** Easements shall stipulate that no trees, shrubs, structures, excavation, or fill be placed, and no regrading be performed within the area of the easement without written approval from the Municipality upon review by the Municipal Engineer. Upon approval of the Municipal Engineer, such landscaping may be placed in maintenance easements, provided it does not impede access.
- 1.12.5** Whenever practicable, easements shall be parallel with, and linked to property lines.
- 1.12.6** All easement agreements shall be recorded with a reference to the recorded easement indicated on the Stormwater Management Plan. The format and content of the easement agreement shall be reviewed and approved by the Municipal Engineer and the Solicitor.

## **SECTION 2. SINKHOLE PROTECTION:**

- 2.1** Stormwater from roadways, parking lots, storm sewers, roof drains, or other concentrated stormwater runoff paths shall not be discharged directly into sinkholes.
- 2.2** To protect sensitive karst areas, the Municipality and its Engineer may require basins to contain an impervious liner. The liner may be of the impervious membrane type, placed in accordance with the manufacturer's recommendations, or an approved alternative as approved by the Municipality and its Engineer.

## **SECTION 3. EROSION AND SEDIMENT CONTROL:**

- 3.1** All plans for erosion and sediment pollution control (E&SPC) shall meet the requirements of The Clean Streams Law, Act of June 22, 1937, P.L. 1987 as amended, 35 P.S. §691.1, et.seq. & 25 PA Code 102.1 et.seq. Erosion Control.

The Lycoming County Conservation District has been delegated the authority by the Pennsylvania Department of Environmental Protection to administer the Erosion & Sediment Pollution Control Program in Lycoming County. It shall be the responsibility of the

Applicant/Developer to submit the E&SPC Plan, Application, and other necessary material to the Conservation District. A copy of the transmittal letter shall be provided to the Municipality. Comments shall be received, and E&SPC Plan approval obtained from the Conservation District prior to Stormwater Management Plan approval.

**SECTION 4. OWNERSHIP, AND OPERATION AND MAINTENANCE:**

**4.1** Each Stormwater Management Plan shall contain provisions which clearly set forth the ownership responsibilities of all permanent stormwater management, and erosion and sediment pollution control facilities, including the following items:

**4.1.1** Description of ownership and maintenance requirements.

**4.1.2** Establishment of suitable easements for access to all facilities, in accordance with Section 1.12 of this Article.

**4.1.3** Identification of the Responsible Party for ownership and maintenance of both temporary and permanent stormwater management, and erosion and sediment pollution control facilities.

Stormwater facilities within subdivisions may be part of an individual lot (or lots) where the respective lot owner (or owners) will own the facility; however, operation and maintenance shall be the responsibility of a homeowner's association, or similar entity. A description of the facility or system, and the terms of the required operation and maintenance shall appear on the Stormwater Management Plan drawing(s), and shall be incorporated into the deed to the property. All Stormwater Management Plan drawings shall be recorded with the approved subdivision plan among the deed records of Lycoming County, Pennsylvania. In addition, the approved subdivision plan, and any deed written from said plan for a lot or lots that will contain stormwater management facilities shall contain a condition stating that it shall be mandatory for the owner (or owners) of said lot (or lots) to be members of said home owners association.

For stormwater management facilities that are proposed as part of a site development plan, the Applicant/Developer will be required to execute a developer agreement and a maintenance agreement with the Municipality for the construction, operation,



and continued maintenance of the facilities prior to approval of the final subdivision or land development plan. Access for inspection by the Municipality of all such facilities deemed critical to the public welfare at any reasonable time shall be provided.

In the event the above priorities cannot be achieved, or where it is required, the facilities may be dedicated to the Municipality in accordance with this Ordinance. As a condition of Municipal acceptance of said facilities, the Applicant/Developer shall provide fifteen (15) percent of the cost of improvements, in the form of a maintenance bond, as estimated by the Applicant's/Developer's Registered Professional, and approved by the Municipal Engineer, to cover contingency maintenance costs for eighteen (18) months from the date that dedication of the stormwater management facilities is accepted by the Municipality. The fifteen (15) percent bond shall be based on the construction costs of the stormwater management facilities that will be offered for dedication to the Municipality.

**SECTION 5. ADDITIONAL GENERAL CRITERIA:** Compliance with the provisions of this Ordinance shall be in accordance with the following additional general criteria:

- 5.1** All materials, workmanship, and methods of work shall comply with the current edition of PA DOT Publication 408 Specifications, as accepted and commonly used by the Municipality, and shall be considered to be incorporated into this Article as if copied in full. In the event a conflict arises between the requirements of this Article and the current edition of the PA DOT Publication 408 Specifications, the Municipal Engineer shall resolve the difference, and his/her opinion shall be binding.
- 5.2** At the completion of the project, and as a prerequisite for the release of the guarantee or issuance of an occupancy permit, the Responsible Party shall:
  - 5.2.1** Provide a certification of completion from a registered professional engineer or professional land surveyor verifying that all permanent facilities have been constructed according to the plans and specifications and approved revisions thereto.
  - 5.2.2** Provide a set of approved stormwater management plan record drawings showing all approved revisions, and elevations and

inverts to all manholes, inlets, pipes, and stormwater management facilities.

- 5.3** The Municipality may inspect stormwater management facilities to ensure that such stormwater management facilities are being operated and maintained as designed. These inspections should occur at least once annually for five (5) years after the installation of said stormwater management facilities, and then at least once every three (3) years thereafter. The Municipality shall may also inspect stormwater management facilities after any storm event.
- 5.4** If the Municipality determines at any time that any permanent stormwater management facility has been eliminated, altered, or improperly operated or maintained, the Municipality will notify the party (or parties) responsible for stormwater management facility operation and maintenance that required corrective measures must be implemented, and will provide said party (or parties) with a specific time frame to implement the required corrective measures. If such action is not undertaken by the party (or parties) responsible for stormwater management facility operation and maintenance, the Municipality may cause the work to be done, and backcharge all costs to the party (or parties) responsible for stormwater management facility operation and maintenance in accordance with Article IV of this Ordinance.
- 5.5** Supplemental minimum standards and criteria contained in the technical reference materials listed in Appendix C of this Ordinance are hereby incorporated into this Ordinance to govern the hydrologic and hydraulic design provisions contained herein.

**ARTICLE IV  
ENFORCEMENT AND PENALTIES**

**SECTION 1. RIGHT-OF-ENTRY:** Upon presentation of proper credentials, duly authorized representatives of the Municipality may enter at reasonable times upon any property within the Municipality to inspect the condition of the stormwater structures and facilities in regard to any aspect regulated by this Ordinance.

**SECTION 2. NOTIFICATION:** In the event that any person (as defined in the Storm Water Management Act, Act of October 4, 1978, P.L. 864 Number 167, 32 P.S. §680.1 et seq. [as amended]) fails to comply with the requirements of this Ordinance, or fails to conform to the requirements of any permit issued hereunder, the Municipality shall provide said person with written notification of the violation. Such notification shall set forth the nature of the violation(s), and establish a time limit for correction of these violations(s). Failure to comply within the time specified shall subject such person to the penalty provision of this Ordinance. All such penalties shall be deemed cumulative. It shall be the responsibility of the owner of the real property on which any Regulated Activity is proposed to occur, is occurring, or has occurred, to comply with the terms and conditions of this Ordinance.

**SECTION 3. ENFORCEMENT:** The municipal governing body is hereby authorized and directed to enforce all of the provisions of this Ordinance. All inspections regarding compliance with the approved Stormwater Management Plan shall be the responsibility of the Municipal Engineer, or other qualified persons designated by the Municipality.

**3.1** A set of design plans approved by the Municipality shall be on file at the site throughout the duration of the construction activity. Periodic inspections may be made by the Municipality or designee during construction.

**3.2** It shall be unlawful for any person (as defined in the Storm Water Management Act, Act of October 4, 1978, P.L. 864 Number 167, 32 P.S. §680.1 et seq. [as amended]) to undertake any activity regulated by this Ordinance on any property except as provided for in the approved Stormwater Management Plan, and pursuant to the requirements of this Ordinance. It shall be unlawful to alter or remove any stormwater structure required by the approved Stormwater Management Plan pursuant to this Ordinance, or to allow the property to remain in a condition which does not conform to the approved Stormwater Management Plan.

- 3.3** At the completion of the project, and as a prerequisite for an occupancy permit and/or the release of the performance guarantee, the party responsible for the ownership and maintenance of the stormwater facilities shall:
- 3.3.1** Provide a certification of completion from a registered professional engineer or a professional land surveyor verifying that all permanent facilities have been constructed according to the plans and specifications, and approved revisions thereto.
  - 3.3.2** Provide a set of record drawings, sealed by a registered engineer or surveyor.
  - 3.3.3** Agree to conduct a visual inspection of all stormwater management, and permanent erosion and sediment pollution control facilities at least once every three (3) months, and immediately after storm events. Such a visual inspection shall at least involve an examination of all stormwater management system facilities for debris deposition (such debris may include, but shall not be limited to aggregate material, leaves, grass clippings, and soil material), settlement, sinkholes, seeps, structural cracking, animal burrows, excessive vegetation, foundation movement, erosion, depressions, water retention times in detention facilities that exceed forty-eight (48) hours, and water retention times in infiltration facilities that exceed seventy-two (72) hours.
- 3.4** After receipt of the certification of completion, a final inspection may be conducted by the Municipality, or its designee, to certify compliance with this Ordinance.
- 3.5** Prior to revocation or suspension of a permit, the Municipality will schedule a hearing to discuss the non-compliance if there is no immediate danger to life, public health, or property.
- 3.6** **Suspension and Revocation of Permits**
- 3.6.1** Any permit issued under this Ordinance may be suspended or revoked by the Municipality for the following reasons:
    - 3.6.1.1** Non-compliance with, or failure to implement any provision of the permit

**3.6.1.2** A violation of any provision of this Ordinance or any other applicable law, ordinance, rule or regulation relating to the project

**3.6.1.3** The creation of any condition, or the commission of any act during construction or development that constitutes or creates a hazard or nuisance, pollution, or that endangers the life or property of others

**3.6.2** A suspended permit shall be reinstated by the Municipality after the following occur:

**3.6.2.1** The Municipal Engineer has inspected and approved the corrections to the stormwater management, and erosion and sediment pollution control measure(s), or the elimination of the hazard or nuisance

**3.6.2.2** The Municipality is satisfied that the violation of the ordinance, law, or rule and regulation has been corrected

A permit revoked by the Municipality cannot be reinstated. The Applicant/Developer may apply for a new permit under the procedures outlined in this Ordinance.

**3.7 Occupancy Permit:** An Occupancy Permit shall not be issued unless the Applicant/Developer has complied with the provisions of this Ordinance.

**SECTION 4. PENALTIES FOR FAILURE TO COMPLY:** Any person (as defined in the Storm Water Management Act, Act of October 4, 1978, P.L. 864 Number 167, 32 P.S. §680.1 et seq. [as amended]) who fails to comply with this Ordinance within the period stated in the notice from the Municipality shall, upon conviction thereof, be guilty of a summary offense, and shall be sentenced to pay a penalty of not more than three-hundred (300) dollars. Each and every day of continued violation, and of each specific violation shall constitute a separate violation.

**4.1** In the event that the owner, developer, occupant, applicant, property manager, or other person responsible for stormwater management facility operation and maintenance fails to comply with the terms of this Ordinance within the time specified by the Municipality, the Municipality may take any actions necessary to remove the public nuisance. The costs associated with the removal of the violation shall be in addition to any penalties for failure to comply.

- 4.2** In addition, the Municipality, through its Solicitor, may institute injunctive, mandamus, or any other appropriate action or proceeding at law or in equity for the enforcement of this Ordinance. Any court of competent jurisdiction shall have the right to issue restraining orders, temporary or permanent injunctions, mandamus, or other appropriate forms of remedy or relief.
- 4.3** The cost of removal, fine, and penalties hereinabove mentioned may be entered by the Municipality as a lien against such property, or properties of individual members of a home owners association, in accordance with existing provisions of law.

**SECTION 5. APPEALS:** Appeals from a determination of the Municipal Engineer in the administration of this Ordinance relative to subdivision, land development, and planned residential development shall be brought before the Fairfield Township Board of Supervisors for a hearing and final adjudication. Appeals from a determination of the Municipal Engineer in the administration of this Ordinance not relative to subdivision, land development, and planned residential development shall be brought before the Fairfield Township Zoning Hearing Board for a hearing and final adjudication. Appeals shall be filed within thirty (30) days after a notice of determination by the Municipal Engineer is issued.

Appeals from a determination of the Fairfield Township Board of Supervisors or the Fairfield Township Zoning Hearing Board shall be brought before the Lycoming County Court of Common Pleas for a hearing and final adjudication. Appeals shall be filed within thirty (30) days after a notice of determination by the Fairfield Township Board of Supervisors or the Fairfield Township Zoning Hearing Board is issued.

Nothing contained in this Section shall be construed to deny any appellant the right to proceed directly to court where appropriate, pursuant to the Pennsylvania Rules of Civil Procedure Number 1091.

**ARTICLE V  
DEFINITIONS**

**SECTION 1. LANGUAGE INTERPRETATIONS:** For the purposes of this Ordinance, certain terms and words used herein shall be interpreted as follows:

- 1.1** Words used in the present tense include the future tense; the singular number includes the plural, and the plural number includes the singular; words of masculine gender include feminine gender, and words of feminine gender include masculine gender.
- 1.2** The word “includes” or “including” shall not limit the term to the specific example, but is intended to extend its meaning to all other instances of like kind and character.
- 1.3** The word “person” shall include an individual, partnership, public or private association or corporation, firm, trust, estate, municipality, governmental unit, public utility, or any other legal entity whatsoever which is recognized by law as the subject of rights and duties.
- 1.4** The words “shall” and “must” are mandatory. The words “may” and “should” are permissive.
- 1.5** The words “used” or “occupied” include the words “intended, designed, maintained, or arranged to be used or occupied.”

**SECTION 2. DEFINITIONS:** The following words and phrases, when used in this Ordinance, shall have, unless the context clearly indicates otherwise, the meanings given to them in this section. All words and terms not defined herein shall be used with a meaning of standard usage.

**AASHTO:** American Association of State Highway and Transportation Officials.

**ACCELERATED EROSION:** The removal of the surface of the land through the combined action of man’s activity and natural processes at a rate greater than would occur because of the natural process alone.

**ALLUVIAL SOILS:** Those areas delineated pursuant to the Lycoming County, Pennsylvania, Soil Survey, November 1986, and as may be amended from time to time.

**ALTERATION:** As applied to land, a change in topography as a result of the moving of soil and rock from one location or position to another; also the

changing of surface conditions by causing the surface to be more or less impervious; land disturbance.

**APPLICANT:** A landowner or Developer who undertakes any Regulated Activity.

**BEST MANAGEMENT PRACTICE (BMP):** Activities, facilities, designs, measures, or procedures used to manage stormwater impacts from regulated activities, to meet State water quality requirements, to promote groundwater recharge, and to otherwise meet the purposes of this Ordinance. Stormwater BMPs are commonly grouped into one of two broad categories or measures: “structural” or “nonstructural.” In this Ordinance, nonstructural BMPs or measures refer to operational and/or behavior-related practices that attempt to minimize the contact of pollutants with stormwater runoff whereas structural BMPs or measures are those that consist of a physical device or practice that is installed to capture and treat stormwater runoff. Structural BMPs include, but are not limited to, a wide variety of practices and devices, from large-scale retention ponds and constructed wetlands, to small-scale underground treatment systems, infiltration facilities, filter strips, low impact design, bioretention, wet ponds, permeable paving, grassed swales, riparian or forested buffers, sand filters, detention basins, and manufactured devices. Structural stormwater BMPs are permanent appurtenances to the project site.

**CARBONATE:** A sediment formed by the organic or inorganic precipitation of mineral compounds characterized by the fundamental chemical ion  $\text{CO}_3$ . The principle element in limestone and dolomite strata.

**CHANNEL:** A perceptible natural or artificial waterway which periodically or continuously contains moving water having a definite bed and banks which confine the water.

**CHANNEL EROSION:** The widening, deepening, and headward cutting of small channels and waterways.

**CISTERN:** An underground reservoir or tank for storing rainwater.

**CLOSED OR UNDRAINED DEPRESSION:** In a karst geologic area, a distinct bowl-shaped depression in the land surface; size and amplitude are variable; drainage is internal. It differs from a sinkhole in that the ground surface is unbroken and usually occurs in greater density per unit area.

**COMMONWEALTH:** The Commonwealth of Pennsylvania.

**CONSERVATION DISTRICT:** The Lycoming County Conservation District.



**CULVERT:** A structure with appurtenant works which carries a stream under or through an embankment or fill.

**DAM:** An artificial barrier, together with its appurtenant works, constructed for the purpose of impounding or storing water or another fluid or semifluid; or a refuse bank, fill or structure for highway, railroad, or other purposes which does or may impound water or another fluid or semifluid.

**DESIGN STORM:** The magnitude of precipitation from a storm event of a specified recurrence interval (e.g. 100-year recurrence interval) and duration (e.g. 24 hours), and used in designing stormwater management systems.

**DETENTION BASIN:** A basin designed to retard stormwater runoff by temporarily storing the stormwater runoff and releasing it at a predetermined rate. A detention basin may be designed to drain completely after a storm event (dry pond), or it may be designed to contain a permanent pool of water (wet pond).

**DEVELOPER:** An individual, public or private association or corporation, partnership, association, municipality or political subdivision of the Commonwealth of Pennsylvania, public utility, institution, authority, firm, trust, estate, receiver, guardian, personal representative, successor, joint venture, joint stock company, fiduciary; Department, agency or instrumentality of State, Federal or local government, or an agent or employee thereof; or any other legal entity who undertakes a Regulated Activity.

**DEVELOPMENT:** See Regulated Activity.

**DEVELOPMENT SITE:** The specific tract of land for which a Regulated Activity is proposed.

**DRAINAGE EASEMENT:** A right granted by a landowner to a grantee, allowing the use of private land for stormwater management purposes.

**DRAINAGE PLAN:** The documentation of the stormwater management system, if any, to be used for a given development site, the contents of which are established in Article II of this Ordinance.

**EARTHMOVING:** See Land Disturbance.

**EASEMENT:** A recorded agreement of right-of-way granted, but not dedicated, for limited use of private land for a public or quasi-public purpose, identified on plan drawings, and within which the owner of the property shall not erect any permanent structures, but shall have the right to any other use of the land which is not inconsistent with the rights of the grantee.

**EROSION:** The removal of soil, stone, and other surface materials by the action of natural elements.

**EROSION AND SEDIMENT POLLUTION CONTROL PLAN:** A plan designed to minimize accelerated erosion and sedimentation.

**FLOOD:** A general but temporary condition of partial or complete inundation of normally dry land areas from the overflow of streams, rivers, and other waters of the Commonwealth.

**FLOODPLAIN:** Any land area susceptible to inundation by water from any natural source, or delineated by applicable Department of Housing and Urban Development, Federal Insurance Administration Flood Hazard Boundary - Mapped as being a special flood hazard area. Also included are areas that comprise Group 13 Soils, as listed in Appendix A of the PA DEP Technical Manual for Sewage Enforcement Officers (as amended or replaced from time to time by PA DEP).

**FOREST MANAGEMENT:** Planning and activities necessary for the management of forest land. These include timber inventory and preparation of forest management plans, silvicultural treatment, cutting budgets, logging road design and construction, timber harvesting, site preparation, and reforestation.

**GABION:** A large rectangular box of heavy gage wire mesh which holds large cobbles and boulders. Used in streams and ponds to change flow patterns, stabilize banks, or prevent erosion.

**GEOLOGIC FORMATION:** The basic or fundamental rock stratigraphic unit in the local classification of rocks, consisting of a body of rock (usually a sedimentary stratum or strata but also igneous or metamorphic) generally characterized by some degree of internal lithologic homogeneity or distinctive lithologic features (such as chemical composition, structures, textures, gross aspect of fossils, or time of deposition). Typically used for mapping the geology of an area.

**GEOLOGIC MEMBER:** A rock stratigraphic unit which is subordinate (a subject) of a formation. This unit is not necessarily mappable, and is usually a unified subdivision of local extent that may or may not be contained in more than one formation.

**GHOST LAKE:** A body of standing water occurring in a sinkhole or closed depression of a karst region that is usually visible after sufficient precipitation has occurred. They may form from slow permeability of soils, rises in the water table, or the development of a natural liner of slow permeable clays or soils.

**GRADE:** A slope, usually of a road, channel, or natural ground specified in percent, and shown on plans as specified herein. (To) Grade - to finish the surface of a roadbed, top of embankment, or bottom of excavation.

**GRADING:** The act the excavating and/or filling land for the purpose of changing natural slope.

**GROUNDWATER RECHARGE:** The replenishment of existing natural underground water supplies.

**IMPERVIOUS AREA:** Impermeable surfaces, such as pavement or rooftops, which limits the infiltration of water into the soil.

**IMPERVIOUS SURFACE:** A surface which limits the penetration of water into the ground.

**IMPOUNDMENT:** A retention or detention basin designed to retain stormwater runoff and release it at a specified rate.

**INFILTRATION STRUCTURE:** A structure designed to direct stormwater runoff into the ground, such as french drains, seepage pits, or seepage trenches.

**INLET:** A surface connection to a closed drain. A structure at the diversion end of a conduit. The upstream end of any structure through which water may flow.

**KARST:** A type of topography that is formed over limestone, dolomite, or gypsum by bedrock solution, and that is characterized by closed depressions or sinkholes, caves, and underground drainage (from AGI, Glossary of Geology, 1972).

**LAND DEVELOPMENT:** Any of the following activities: (1) The improvement of one lot or two or more contiguous lots, tracts or parcels of land for any purpose involving (I) a group of two or more residential or nonresidential buildings, whether proposed initially or cumulatively, or a single nonresidential building on a lot or lots regardless of the number of occupants or tenure; (ii) or the division or allocation of land or space, whether initially or cumulatively, between or among two or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups or other features; (2) a subdivision of land; (3) development in accordance with section 503(1.1).

**LAND DISTURBANCE:** Any activity involving grading, tilling, digging, or filling of ground, stripping of vegetation; or any other activity that causes land to be exposed to erosion and/or impacts stormwater runoff characteristics.

**LEVEL SPREADER:** A device used to spread out stormwater runoff uniformly over the ground surface as sheet flow (i.e., not through channels). The purpose of level spreaders is to prevent concentrated, erosive flows from occurring, and to enhance infiltration.

**LINEAMENTS:** Straight or gently curved, lengthy features frequently expressed topographically as depressions or lines on the earth's surface. They can be more easily observed at a height of one hundred (100) meters or more, and are usually found by researching aerial photographs or satellite photography. They are usually located in areas of faulting or in dense jointing along some rock stratigraphy.

**LOW FLOW CHANNEL:** An incised or paved channel from inlet to outlet in a dry basin which is designed to carry low stormwater runoff flows and/or base flow directly to the outlet without detention.

**MS4:** Municipal Separate Storm Sewer System.

**MUNICIPAL ENGINEER:** A registered professional engineer engaged by Fairfield Township to provide municipal engineering services.

**MUNICIPALITY:** Fairfield Township, Lycoming County, Pennsylvania.

**NPDES:** National Pollutant Discharge Elimination System.

**NRCS:** USDA, Natural Resources Conservation Service (previously SCS).

**OPEN CHANNEL:** A drainage element in which stormwater flows with an open surface. Open channels include, but shall not be limited to, natural and man-made drainageways, swales, streams, ditches, canals, and pipes flowing partly full.

**OUTLET:** Points of water disposal from a stream, river, lake, tidewater, or artificial drain.

**PA DEP:** The Pennsylvania Department of Environmental Protection.

**PA DOT:** The Pennsylvania Department of Transportation.

**PEAK DISCHARGE:** The maximum rate of flow of water at a given point and time resulting from a storm event.

**PENNSYLVANIA MUNICIPALITIES PLANNING CODE:** Act of 1968, July 31, P.L. 805, as amended (53 P.S. 10101 et seq.).

**PIPE:** A culvert, closed conduit, or similar structure (including appurtenances) that conveys stormwater.

**PLANNED RESIDENTIAL DEVELOPMENT:** An area of land, controlled by a landowner, to be developed as a single entity for a number of dwelling units, or combination of residential and nonresidential uses, the development plan for which does not correspond in lot size, bulk, type of dwelling, or use, density, or intensity, lot coverage and required open space to the regulations established in any one district created, from time to time, under the provisions of a municipal zoning ordinance.

**PROFESSIONAL ENGINEER:** An individual licensed and registered under the laws of Pennsylvania to engage in the practice of engineering (as defined by Commonwealth of Pennsylvania Act of 1945, P.L. 913, No. 367). For the purposes of this Ordinance, said individual must be trained and experienced in the design of stormwater management and conveyance systems.

**PROFESSIONAL LAND SURVEYOR:** An individual licensed and registered under the laws of Pennsylvania to engage in the practice of land surveying (as defined by Commonwealth of Pennsylvania Act of 1945, P.L. 913, No. 367). For the purposes of this Ordinance, said individual must be trained and experienced in the design of stormwater management and conveyance systems.

**RATIONAL METHOD:** A rainfall-runoff relation used to estimate peak flow.

**RECORD DRAWING:** A drawing prepared by a Registered Professional that depicts the constructed (as-built) improvements associated with a Regulated Activity. Such improvements include (but are not limited to buildings, driveways, grading, parking areas, stormwater management facilities, streets, etc.).

**REGISTERED LANDSCAPE ARCHITECT:** A person licensed and registered under the laws of Pennsylvania who engages or offers to engage in the practice of landscape architecture (as defined by Commonwealth of Pennsylvania Act 535 of 1965). For the purposes of this Ordinance, said person must be trained and experienced in the design of stormwater management and conveyance systems.

**REGISTERED PROFESSIONAL:** See Professional Engineer, Professional Land Surveyor, and Registered Landscape Architect.

**REGULATED ACTIVITY (ACTIVITIES):** Action(s) or proposed action(s) that impact stormwater runoff in any manner, including, but not limited to, earthmoving, forest management/timber operations, land development, land disturbance, and subdivision; and any activities that may contribute non-stormwater discharges to a regulated small MS4.

**RESPONSIBLE PARTY:** A “Person” as defined in the Storm Water Management Act, Act of October 4, 1978, P.L. 864 Number 167, 32 P.S. §680.1 et seq. (as amended).

**RETENTION BASIN:** A basin in which stormwater runoff from a given flood event is stored and is not discharged into the downstream drainage system during the flood event.

**RECURRENCE INTERVAL:** The average interval, in years, within which a rainfall event of a given magnitude and duration can be expected to recur. For example, a 25-year recurrence interval event would be expected to recur on the average once every twenty-five years.

**RIPRAP:** A combination of large stone, cobbles, and boulders used to line channels, stabilize banks, and reduce stormwater runoff velocities.

**RISER:** A vertical pipe, extending from the bottom of a detention basin, that is used to limit the discharge rate from the detention basin for a specified design storm.

**RUNOFF:** Any part of precipitation that flows over the land surface.

**SCS:** USDA, Soil Conservation Service (now NRCS).

**SEDIMENT BASIN:** A barrier, dam, retention or detention basin located and designed to retain rock, sand, gravel, silt, or other water transported material.

**SEDIMENT POLLUTION:** The placement, discharge, or any other introduction of sediment into the waters of the Commonwealth occurring from the failure to design, construct, implement, or maintain control measures and control facilities in accordance with the requirements of this Ordinance.

**SEDIMENTATION:** The process by which mineral or organic matter is accumulated or deposited by the movement of water.

**SEEPAGE PIT/SEEPAGE TRENCH:** An area of excavated earth filled with loose stone or similar coarse material, into which surface water is directed for infiltration into the ground.

**SHEET FLOW:** Stormwater runoff which flows over the ground surface as a thin, even layer, not concentrated in a channel. Flow depth is generally 0.1 ft. or less.

**SINKHOLE:** A localized, gradual or rapid sinking of the land surface to a variable depth, occurring in areas of carbonate bedrock; generally characterized

by a roughly circular outline, a distant breaking of the ground surface and downward movement of soil into bedrock voids.

**SINKHOLE FLOODPLAIN:** The area inundated by the 24-hour, 100-year recurrence interval design storm, assuming no drainage from the sinkhole or closed depression, based upon anticipated stormwater runoff volumes with maximum development permitted by zoning within the catchment area or area draining to the sinkhole.

**SOIL-COVER COMPLEX METHOD:** A method of computing stormwater runoff developed by NRCS, and found in its publication National Engineering Handbook, Part 630 - Hydrology (USDA, NRCS).

**SPILLWAY:** A depression in the embankment of a detention basin which is used to pass peak discharge greater than the maximum design storm that said detention basin was designed for.

**STATE WATER QUALITY REQUIREMENTS:** The regulatory requirements to protect, maintain, reclaim, and restore water quality under Title 25 of the Pennsylvania Code and the Clean Stream Law.

**STORM SEWER:** A system of pipes or other conduits which carry intercepted surface stormwater runoff, street water, and other water or drainage, excluding domestic sewage and industrial wastes.

**STORMWATER:** Drainage runoff from the surface of the land resulting from precipitation, or snow or ice melt.

**STORMWATER MANAGEMENT FACILITY:** Any structure, natural or man-made, that, due to its condition, design, or construction, conveys, stores, or otherwise affects stormwater runoff. Typical stormwater management facilities include, but are not limited to, detention and retention basins, open channels, storm sewers, pipes, and infiltration structures.

**STRATA:** Tabular or sheet-like mass, distinct layers of homogenous or gradational sedimentary material (consolidated rock or unconsolidated earth) of any thickness, visually separable from other layers above and below by a discrete change in the character of the material deposited, or by a sharp physical break, deposition, or both.

**STRATIGRAPHIC UNIT:** A stratum or body of strata recognized as a unit in the classification of the rocks of the earth's crust with respect to any specific rock character, property, attribute, or for any purpose such as description, mapping, and correlation.

**SUBAREA:** The smallest drainage unit of a watershed for which stormwater management criteria have been established in the Stormwater Management Plan.

**SUBDIVISION:** The division or redivision of a lot, tract or parcel of land by any means into two or more lots, tracts, parcels or other divisions of land including changes in existing lot lines for the purpose, whether immediate or future, of lease, partition by the court for distribution to heirs or devisees, transfer of ownership or building or lot development: provided, however, that the subdivision by lease of land for agricultural purposes into parcels of more than ten acres, not involving any new street or easement of access or any residential dwelling, shall be exempted.

**SWALE:** A low-lying stretch of land or wide shallow ditch, usually grassed or paved, which gathers or carries stormwater runoff.

**TIMBER OPERATIONS:** See Forest Management.

**TIME OF CONCENTRATION:** The time for surface runoff to travel from the hydraulically most distant point of the watershed to a point of interest within the watershed. This time is the combined total of overland flow time and flow time in any pipes or channels.

**TOPOGRAPHY:** The general configuration of a land surface or any part of the earth's surface, including its relief and position of its natural and man-made features. The natural or physical surface features of a region, considered collectively as to its form.

**U.S.:** United States

**USACE:** United States Army Corps of Engineers

**USDA:** United States Department of Agriculture

**WATERCOURSE:** A stream of water, river, brook, creek, or a channel or ditch for water, whether natural or manmade.

**WATERSHED:** The entire region or area drained by a river or other body of water, whether natural or artificial; a drainage basin or sub-basin.

**WATERS OF THE COMMONWEALTH:** Any and all rivers, streams, creeks, rivulets, impoundments, ditches, watercourses, storm sewers, lakes, dammed water, wetlands, ponds, springs, and all other bodies or channels of conveyance of surface and underground water, or parts thereof, whether natural or artificial, within or on the boundaries of the Commonwealth.



**WETLAND:** Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs, ferns, and similar areas.

**ARTICLE VI  
FEES AND EXPENSES**

**SECTION 1. GENERAL:** The fee required by this Ordinance is a Review Fee. The Municipality may include all costs incurred in the Review Fee. The Applicant/Developer shall pay all Review Fees.

**SECTION 2. EXPENSES COVERED BY REVIEW FEE:** The Review Fee shall, at a minimum, cover the following:

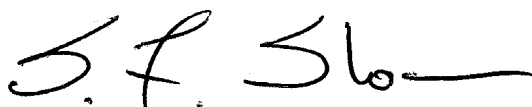
- 2.1** Municipal and/or Municipal Engineer administrative/clerical work.
- 2.2** Review of a Drainage Plan and supplemental information by the Municipality and/or the Municipal Engineer.
- 2.3** Meetings attended by the Municipality and/or the Municipal Engineer.
- 2.4** Inspections conducted by the Municipality and/or the Municipal Engineer, including, but not limited to, pre-design and pre-construction inspections, inspections during construction, and post-construction inspections.
- 2.5** Any and all work by the Municipality and/or the Municipal Engineer to enforce any provision(s) of this Ordinance, correct violations, and assure proper completion of stipulated remedial action(s).
- 2.6** Any other reasonable and necessary charges that the Municipality may incur relative to the administration and enforcement of this Ordinance.

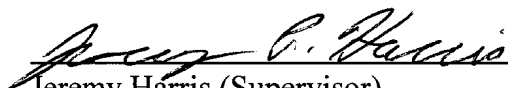
**ARTICLE VII  
ENACTMENT**

- SECTION 1. REPEALER:** All other ordinances or parts of ordinances of Fairfield Township that are contrary to the provisions of this Ordinance are hereby repealed to the extent necessary to give this Ordinance full force and effect.
- SECTION 2. EFFECTIVE DATE:** This Ordinance shall become effective on November 10, 2012.
- SECTION 3.** Appendix A, Appendix B, and Appendix C of this Ordinance may be amended, as necessary, by a resolution of Fairfield Township.


Fairfield Township Supervisors

By:   
Grant Hetler (Chairman)

  
Scott Slocum (Vice Chairman)

  
Jeremy Harris (Supervisor)

ATTEST:

By:   
Ronald Springman (Secretary)

## APPENDIX A

### I. STORMWATER MANAGEMENT COMPUTATIONAL VALUES

- A. TR 55 Curve Numbers: See Table A-1 (page A-2)
- B. Rational Method Runoff Coefficients: See Table A-2 (page A-3)

### II. DESIGN CRITERIA FOR ROADSIDE SWALES, PERENNIAL STREAMS, CULVERTS, AND DRAINAGE CHANNELS

#### A. DRAINAGE SWALES:

1. Where vegetated roadside swales are used in lieu of, or in addition to storm sewers, they shall be designed to carry, at a minimum, the 10-year recurrence interval peak discharge without erosion, and also to increase the time of concentration, reduce the peak discharge and velocity, and permit water to percolate into the soil.

Several acceptable sources outline design procedures for roadside swales with flexible linings, including the following:

- Design of Roadside Channels with Flexible Linings  
Hydraulic Engineering Circular No. 15  
U.S. Department of Transportation  
Federal Highway Administration
- Stability Design of Grass-Lined Open Channels  
Agriculture Handbook Number 667  
U.S. Department of Agriculture  
Agriculture Research Service

The maximum velocities and/or shear stresses permitted for all roadside swales shall be in accordance with the methods presented in the Erosion and Sediment Pollution Control Program Manual (PA DEP).

2. The maximum encroachment of water on the roadway pavement along roadside swales in cut areas shall not exceed half of a through traffic lane during a 10-year recurrence interval design storm. Frequent and/or sustained flooding of the subbase shall be avoided. Inlets shall be provided to limit the shoulder encroachment and water velocity.

**TABLE A-1**  
**TR-55 RUNOFF CURVE NUMBERS**  
**AND**  
**AVERAGE IMPERVIOUSNESS FOR VARIOUS LAND USES BY HYDROLOGIC SOIL GROUP**

COVER DESCRIPTION LAND USE/COVER TYPE	AVERAGE IMPERVIOUSNESS (PERCENT)	CURVE NUMBERS BY HYDROLOGIC SOIL GROUP			
		A	B	C	D
Open Space (e.g. lawns, parks, golf courses, cemeteries, etc.) in good condition (grass cover greater than seventy-five percent)	N/A	39	61	74	80
Impervious Areas	N/A	98	98	98	98
Gravel Areas	N/A	76	85	89	91
Commercial Land Uses	85	89	92	94	95
Industrial Land Uses	72	81	88	91	93
1/8 Acre Residential Lot(s)	65	77	85	90	92
1/4 Acre Residential Lot(s)	38	61	75	83	87
1/3 Acre Residential Lot(s)	30	57	72	81	86
1/2 Acre Residential Lot(s)	25	54	70	80	85
1 Acre Residential Lot(s)	20	51	68	79	84
2 Acres Residential Lot(s)	12	46	65	77	82
Woodland (in good condition)	N/A	30	55	70	77
Brush	N/A	35	56	70	77
Meadow	N/A	30	58	71	78

Source: U.S. Department of Agriculture, Soil Conservation Service, Engineering Division, 1986, "Urban Hydrology for Small Watersheds," Technical Release 55, Washington, D.C.

**TABLE A-2**

**RATIONAL METHOD RUNOFF COEFFICIENTS  
BY HYDROLOGIC SOIL GROUP (HSG), OVERLAND SLOPE, AND RECURRENCE INTERVAL**

COVER DESCRIPTION LAND USE/COVER TYPE	RECURRENCE INTERVAL	HSG A			HSG B			HSG C			HSG D		
		0%-2%	2%-6%	6%+	0%-2%	2%-6%	6%+	0%-2%	2%-6%	6%+	0%-2%	2%-6%	6%+
Cultivated Land	< 25-Years	0.08	0.13	0.16	0.11	0.15	0.21	0.14	0.19	0.26	0.18	0.23	0.31
	≥ 25-Years	0.14	0.18	0.22	0.16	0.21	0.28	0.20	0.25	0.34	0.24	0.29	0.41
Pasture	< 25-Years	0.12	0.20	0.30	0.18	0.28	0.37	0.24	0.34	0.44	0.30	0.40	0.50
	≥ 25-Years	0.15	0.25	0.37	0.23	0.34	0.45	0.30	0.42	0.52	0.37	0.50	0.62
Meadow <sup>a</sup>	< 25-Years	0.10	0.16	0.25	0.14	0.22	0.30	0.20	0.28	0.36	0.24	0.30	0.40
	≥ 25-Years	0.14	0.22	0.30	0.20	0.28	0.37	0.28	0.35	0.44	0.30	0.40	0.50
Forest	< 25-Years	0.05	0.08	0.11	0.08	0.11	0.14	0.10	0.13	0.16	0.12	0.16	0.20
	≥ 25-Years	0.08	0.11	0.14	0.10	0.14	0.18	0.12	0.16	0.20	0.15	0.20	0.25
1/8 Acre Residential Lot(s)	< 25-Years	0.25	0.28	0.31	0.27	0.30	0.35	0.30	0.33	0.38	0.33	0.36	0.42
	≥ 25-Years	0.33	0.37	0.40	0.35	0.39	0.44	0.38	0.42	0.49	0.41	0.45	0.54
1/4 Acres Residential Lot(s)	< 25-Years	0.22	0.26	0.29	0.24	0.29	0.33	0.27	0.31	0.36	0.30	0.34	0.40
	≥ 25-Years	0.30	0.34	0.37	0.33	0.37	0.42	0.36	0.40	0.47	0.38	0.42	0.52
1/3 Acre Residential Lot(s)	< 25-Years	0.19	0.23	0.26	0.22	0.26	0.30	0.25	0.29	0.34	0.28	0.32	0.39
	≥ 25-Years	0.28	0.32	0.35	0.30	0.35	0.39	0.33	0.38	0.45	0.36	0.40	0.50
1/2 Acre Residential Lot(s)	< 25-Years	0.16	0.20	0.24	0.19	0.23	0.28	0.22	0.27	0.32	0.26	0.30	0.37
	≥ 25-Years	0.25	0.29	0.32	0.28	0.32	0.36	0.31	0.35	0.42	0.34	0.38	0.48
1 Acre Residential Lot(s)	< 25-Years	0.14	0.19	0.22	0.17	0.21	0.26	0.20	0.25	0.31	0.24	0.29	0.35
	≥ 25-Years	0.22	0.26	0.29	0.24	0.28	0.34	0.28	0.32	0.40	0.31	0.35	0.46
Industrial Land Uses	< 25-Years	0.67	0.68	0.68	0.68	0.68	0.69	0.68	0.69	0.69	0.69	0.69	0.70
	≥ 25-Years	0.85	0.85	0.86	0.85	0.86	0.86	0.86	0.86	0.87	0.86	0.86	0.88
Commercial Land Uses	< 25-Years	0.71	0.71	0.72	0.71	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
	≥ 25-Years	0.88	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.90	0.89	0.89	0.90
Streets (Including Right-Of-Way)	< 25-Years	0.70	0.71	0.72	0.71	0.72	0.74	0.72	0.73	0.76	0.73	0.75	0.78
	≥ 25-Years	0.76	0.77	0.79	0.80	0.82	0.84	0.84	0.85	0.89	0.89	0.91	0.95
Open Space <sup>a</sup>	< 25-Years	0.05	0.10	0.14	0.08	0.13	0.19	0.12	0.17	0.24	0.16	0.21	0.28
	≥ 25-Years	0.11	0.16	0.20	0.14	0.19	0.26	0.18	0.23	0.32	0.22	0.27	0.39
Impervious Areas	< 25-Years	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87
	≥ 25-Years	0.95	0.96	0.97	0.95	0.96	0.97	0.95	0.96	0.97	0.95	0.96	0.97

<sup>a</sup> Open Space coefficients shall be used for all pre-development pervious areas; and for all undeveloped and undisturbed, densely vegetated (non-forest) areas instead of Meadow coefficients.

Source: Rawls, W.J., S.L. Wong and R.H. McCuen, 1981, "Comparison of Urban Flood Frequency Procedures," Preliminary Draft, U.S. Department of Agriculture, Soil Conservation Service, Beltsville, MD.

3. Roadside swales shall be designed in accordance with Design of Roadside Channels with Flexible Linings, Hydraulic Engineering Circular No. 15 (US DOT, FHA). Acceptable Manning's "n" values for various swales appear in Table 5-6 of "Open Channel Hydraulics" by Ven T. Chow (McGraw Hill, New York, 1959).
4. The side slope for any vegetated roadside swale requiring mowing of the vegetation shall have a maximum grade of three (3) horizontal to one (1) vertical on those areas to be mowed.
5. Erosion Prevention: All roadside swales shall be designed to prevent the erosion of the bed and bank areas. Suitable temporary and/or permanent stabilization during vegetative cover establishment shall be provided to prevent erosion.
6. Roadside swales shall discharge to a detention or retention basin to attenuate the peak rate and volume, respectively, of stormwater runoff, except as provided in the drainage plan.
7. Because of the critical nature of vegetated roadside swales, the design of all vegetated swales shall, at a minimum, conform to the design procedures outlined in the Erosion and Sediment Pollution Control Program Manual (PA DEP). Other sources of design information for vegetated swales are provided in Appendix A, Section II, Subsection B.2 of this Ordinance.
8. Deed restrictions may be required on property(ies) containing roadside swales. When required, these deed restrictions shall specify that no property owner obstruct or alter any roadside swale identified in the Stormwater Management Plan.

**B. CULVERTS AND DRAINAGE CHANNELS:**

1. Culverts and drainage channels shall be designed to carry flow rates determined as outlined in Article III, Section 1.7 of this Ordinance.
2. The capacity of all pipe culverts shall, at a minimum, provide the required carrying capacity as determined by the following sources:
  - Hydraulic Charts for the Selection of Highway Culverts  
Hydraulic Engineering Circular No. 5  
United States Department of Commerce  
Bureau of Public Roads

- Capacity Charts for the Hydraulic Design of Highway Culverts  
Hydraulic Engineering Circular No. 10  
United States Department of Commerce  
Bureau of Public Roads
- Hydraulic Design of Improved Inlets for Culverts  
Hydraulic Engineering Circular No. 13  
Federal Highway Administration

Acceptable Manning's "n" values for various culvert pipes appear in Design Manual Part 2 - Highway Design, Publication 13M (PA DOT), Chapter 10.

Reference to publications and source documents in this section shall be deemed to include any amendments and/or revisions thereto.

3. All storm drain culvert pipes shall be designed to maintain a minimum grade of one-half (1/2) percent. All storm pipes shall have a minimum inside diameter of fifteen (15) inches, or a cross-sectional area of one hundred seventy-six (176) square inches, except that pipes under a twenty-five feet or greater fill shall have a minimum diameter of twenty-four (24) inches, or a cross-sectional area of four hundred fifty-three (453) square inches, and shall consist of reinforced concrete.
4. Where storm sewers discharge into existing drainage channels at an angle greater than thirty (30) degrees from parallel with the downstream channel flow, the far side bank shall be stabilized by the use of riprap or masonry, and/or concrete walls, and the stabilization shall be designed to prevent erosion and frost heave under and behind the stabilizing media.
5. Where headroom is restricted, equivalent pipe arches may be used in lieu of circular pipe.
6. Several acceptable sources outline design procedures for drainage channels with flexible linings, including the following:
  - Design of Roadside Channels with Flexible Linings  
Hydraulic Engineering Circular No. 15  
U.S. Department of Transportation  
Federal Highway Administration
  - Stability Design of Grass-Lined Open Channels  
Agriculture Handbook Number 667  
U.S. Department of Agriculture  
Agriculture Research Service



Acceptable Manning's "n" values for various channels appear in Table 5-6 of "Open Channel Hydraulics" by Ven T. Chow (McGraw Hill, New York, 1959).

7. All drainage channels shall be designed to prevent the erosion of the bed and bank areas. Suitable bank stabilization shall be provided, where required, to prevent erosion of the drainage channels as follows:
  - a. The maximum velocities and/or shear stresses permitted for all drainage channels shall be in accordance with the methods presented in the Erosion and Sediment Pollution Control Program Manual (PA DEP).
  - b. A minimum grade of one (1) percent is desirable for all drainage channels.
8. Deed restrictions may be required on property(ies) containing culverts, drainage channels, and/or perennial streams. When required, these deed restrictions shall specify that no property owner obstruct or alter any drainage channel or perennial stream identified in the Stormwater Management Plan.

### **III. STORMWATER MANAGEMENT MEASURES**

#### **A. DESIGN OF DETENTION BASINS:**

All detention basin storage shall be designed by hydrograph routings. Hydrographs shall be developed from methods outlined in Section 1.4 under the approval of the Municipality and its Engineer. Hydrographs shall be routed through the basin or stormwater management facility using the modified Puls method, or other appropriate routing method approved by the Municipality and its Engineer.

#### **B. BASIN DESIGN:**

In addition to the following criteria, the design criteria contained in Article III, Section 1.1 of this Ordinance shall be used in the design of all detention basins in the Municipality:

1. Where a riser is provided at the outlet of the detention basin, the riser shall be constructed of metal or concrete as approved by the Municipality and its Engineer. Risers shall be designed so that the rate of outflow is controlled by the pipe barrel through the basin berm when the depth of the water within the basin exceeds the height of the riser, or by accurately sized orifices. All metal risers, where approved for use, shall be suitably coated to prevent

corrosion. A trash rack, or similar appurtenance, shall be provided to prevent debris from entering the riser. All metal risers shall have a concrete base attached with a watertight connection, and such base shall be of sufficient weight to prevent flotation of the riser, and to prevent movement due to frost. Concrete risers shall have a footer to prevent movement due to frost. An anti-vortex device, consisting of a thin vertical plate normal to the basin berm, shall be provided on the top of all metal risers. Suitable perforated metal riser designs are outlined in the following sources:

- Erosion and Sediment Pollution Control Program Manual (PA DEP).

2. Overflow spillways shall be incorporated into the design of all basins, and shall be constructed of reinforced concrete, vegetated earth, or riprap in accordance with generally accepted engineering practice. All overflow spillways shall be constructed so that the detention basin berm is protected against erosion. The minimum capacity of all overflow spillways shall be the peak rate of flow to the basin from the 100-year recurrence interval design storm. The dimensions of the overflow spillways can be determined from the Erosion and Sediment Pollution Control Program Manual (PA DEP). Overflow spillways shall extend along the upstream and downstream berm embankment slopes. The downstream slope of the spillway shall, at a minimum, extend to the toe of the berm embankment. The overflow spillway shall not discharge over un-compacted earthen fill and/or easily erodible material. The Municipality and its Engineer may require the use of open concrete lattice blocks, stone riprap, or concrete spillways when slopes would exceed four (4) feet horizontal to one (1) foot vertical, and spillway velocities might exceed Natural Resource Conservation Service standards for the particular soils involved.

Where overflow spillways are not practical, then an overflow structure (e.g. riser structure with pipe outlet) shall be provided. Such overflow structure shall be sized to convey the peak rate of flow to the basin from the 100-year recurrence interval design storm. The Municipality and its Engineer may approve the use of other sizing criteria for overflow spillways/structures that cannot practically be designed to convey the 100-year recurrence interval peak design flow.

3. Anti-seep collars shall be installed around the principal pipe barrel within the normal saturation zone of the detention basin berms, and shall project a minimum of two (2) feet in all directions around the pipe barrel. The anti-seep collars and their connections to the pipe barrel shall be watertight. Anti-seep collars shall be designed in accordance with anti-seep collar design criteria in Erosion and Sediment Pollution Control Best Management

Practice (BMP) Manual (PA DEP); and Appendix B.1 of NRCS-MD Code Number 378, Pond Standards/Specifications.

4. Freeboard is the difference between the design flow elevation in the overflow spillway/overflow structure and the top of the settled detention basin embankment. The minimum freeboard shall be one (1) foot.
5. The toe of any fill slope, and the top of any cut slope shall be located a minimum of ten (10) feet from any property line. Whenever possible, the side slopes and basin shape shall be amenable to the natural topography. Straight side slopes and rectangular basins shall be avoided whenever possible. Exterior slopes of compacted soil shall not exceed three (3) feet horizontal to one (1) foot vertical, and may be further reduced if the soil has unstable characteristics. Interior slopes of the basin shall not exceed three (3) feet horizontal to one (1) foot vertical, except with approval of the Municipality and its Engineer. Where concrete, stone, or brick walls are used with side slopes proposed to be steeper than three (3) feet horizontal to one (1) foot vertical, the basin shall be fenced by a permanent wire fence forty-two (42) inches in height, and a ramp, constructed of durable, non-slip material to a grade of less than ten (10) percent for maintenance vehicles, shall be provided for access into the basin.
6. The minimum top width of detention basin berms shall be ten (10) feet.
7. The bottom of the basin should be sloped at a minimum grade of two (2) percent toward the basin outlet structure in order to insure proper drainage of the detention basin. However, the Municipality and its Engineer may allow basins to be designed and constructed with bottom slopes less than two (2) percent as a best management practice.

Inlet and outlet structures should be located at maximum distances from one another. The Municipality and its Engineer may require a rock filter berm, rock-filled gabions, or suitable landscaping or vegetative material between inlet and outlet structures as a best management practice.

A collecting swale or low flow channel and/or underdrain shall be provided to drain basins designed for use as recreational facilities, and should be sloped at a minimum grade of one (1) percent toward the basin outlet structure.

8. Energy dissipating devices (riprap, end sills, etc.) shall be placed at all stormwater discharge points.

9. The distance from the highest free water surface of any detention basin or drainage facility to a dwelling unit should be a minimum of fifty (50) feet.
10. All landscaping and grading standards particularly applicable to detention basins are included in Appendix A, Section V of this Ordinance.
11. A quality control program is critical for embankment fills. Therefore, wherever embankment fill material in excess of three (3) feet is to be used, each layer of compacted fill should be tested to determine its density per ASTM D 1556, ASTM D 2922, or ASTM D 3017. The density of each layer shall be ninety-eight (98) percent of a standard Proctor analysis per ASTM D698. The depth of each fill layer (measured loose) should not exceed six inches. Fill material containing particles ranging from small gravel or coarse sand to fine sand and clay, in the desired proportion, is acceptable. Fill material should contain approximately twenty (20) percent clay particles by weight. Using the unified soil classification system, SC (clayey sand), GC (clayey gravel), and CL (“low liquid limit” clay) are among the preferred types of embankment soils. The area on which the fill material will be placed shall be scarified prior to the placement of fill materials.

Compaction test reports shall be kept on file at the site, and be shall be subject to review at all times with copies being forwarded to the Municipality and its Engineer.

When rock is encountered during the excavation of a detention basin, it should be removed to an elevation of at least twelve (12) inches below the proposed basin floor, if the basin will function to enhance stormwater quality (when a manufactured liner will be used, rock shall be excavated to an elevation of 24 inches to 30 inches below the proposed basin floor).

Temporary and permanent grasses or stabilization measures shall be established on the sides and base of all earthen basins immediately after final grading of the basin is complete.

12. As part of the Stormwater Management Plan and Report, all design information shall be submitted including, but not limited to, the following:
  - a. General description of proposed facilities and the operation of the stormwater management measures;
  - b. All computations of stormwater runoff before and after construction, including all supporting material;

- c. The stormwater plan must include a discussion of how it will function during construction, and include supporting documentation;
  - d. A sketch of the berm embankment and outlet structure indicating the embankment top elevation, embankment side slopes, top width of embankment, overflow spillway elevation, riser dimensions, orifice dimensions, pipe barrel dimensions, and dimensions and spacing of antiseep collars;
  - e. Design computations for the pipe barrel and riser;
  - f. A plot or table of the stage versus storage and all supporting computations;
  - g. Flood routing computations;
  - h. A detailed plan of the trash rack and anti-vortex device;
  - i. A plan, at a scale of one (1) inch equals fifty (50) feet (or larger), showing the grading, landscaping, and fencing around the detention basin;
  - j. Soils Investigation Report, as required and outlined in Article II, Section 3, Subsection 3.4 of this Ordinance;
13. The Engineering Field Manual for Conservation Practices - Part 1 of 2 (USDA, NRCS), and the Urban Drainage Design Manual (HEC-22, US DOT, FHA) contain design, construction, and maintenance guidelines that are applicable to detention basins.
14. As a component of the Stormwater Plan, the design engineer should include a safety plan related to the depth of water in the detention or retention basin.
15. Within sensitive karst areas, the Municipality and its Engineer may require basins to contain an impervious liner. The liner may be of the impervious membrane type, placed in accordance with the manufacturer's recommendations, or an improved alternative, as approved by the Municipality and its Engineer. Alternatively, the Municipality and its Engineer may require details for repairing sinkholes in lieu of an impervious liner. Such sinkhole repair details shall be mentioned in a stormwater management maintenance plan.

16. Inspections may be conducted by the Municipality and its Engineer during construction of the stormwater management basin and facilities. Such inspections do not constitute approval of construction methods and materials.

#### **IV. DESIGN CRITERIA FOR FACILITIES TO ENCOURAGE RECHARGE**

##### **A. DESIGN OF SEEPAGE PITS AND SEEPAGE TRENCHES FOR INFILTRATION OF ROOF DRAINAGE:**

1. These structures shall be designed to assimilate, in seventy-two (72) hours, a volume of water equal to 0.22 cubic feet per square foot of roof coverage (i.e., length x width of building space covered).
2. The soils on which a seepage pit or trench are located shall have a minimum infiltration rate of 0.27 inches per hour, based upon soils data obtained by direct testing methods in accordance with procedures outlined by PA DEP.
3. The porosity of the gravel or rock to be used in seepage pits must be specified in the plan. The rock or gravel shall be covered with a PA DOT Class 1 geotextile material.
4. Seepage pits or seepage trenches shall not be installed on slopes greater than twenty (20) percent.
5. Seepage pits or the drains to them must contain a sediment trap that can be maintained regularly. All downspouts should have leaf strainers to prevent leaves from clogging the seepage pit.
6. Seepage pits connected to roof drains shall be located at least ten feet from basement walls and downhill from the site building(s).
7. The bottom of a seepage pit shall be at least two (2) feet above seasonal high water table and bedrock, or be shown to be otherwise capable of handling required design volumes.
8. Stormwater runoff capacity may be distributed among several seepage pits, trenches, or berms so long as total assimilative capacity of all structures equals the required volume.
9. Where adequate seepage pit capacity is difficult to achieve with a rock-filled pit, a concrete (or equivalent material) culvert pipe with a lid may be placed vertically over a stone bed to provide storage capacity. Alternatively, a

septic tank-type structure operating as a cistern with discharge to the seepage pit may be used.

10. The longer dimension of seepage pits or seepage trenches should parallel the slope where slopes exceed five (5) percent.
11. The use of a “perforated” or porous pipe leading to the seepage pit is encouraged.
12. In all cases, an overflow system should be provided to accommodate heavy rains in excess of the design criteria.

**B. DESIGN OF SEEPAGE PITS AND SEEPAGE TRENCHES - OTHER THAN ROOF DRAINAGE:**

1. Where seepage pits or trenches will be used for infiltration of stormwater runoff from grassed areas or streets, their design shall generally follow the guidelines of Appendix A, Section IV, Subsection A of this Ordinance.
2. Seepage trenches for such flows shall be located in diversion channels where feasible.
3. Seepage pits be installed in drainage swales uphill of check dams or small detention facilities.

**C. DESIGN OF CISTERNS OF WATER STORAGE FACILITIES:**

1. These structures shall either be located within a building or below frost level where they will be protected against freezing. They shall be designed to hold 0.22 cubic feet of water per square foot of roof coverage.
2. Access to the structures by insect or animal vectors shall be controlled by screens or other obstructions.
3. Facilities to be used for water supply purposes shall comply with plumbing code regulations for cross-connections.
4. Roof top storage must comply with all building code regulations on load limitations and other related factors.
5. All water storage facilities shall be equipped to divert flows in excess of their holding capacity to appropriate areas of discharge. If water stored in cisterns will not be used for non-potable water supply purposes, the facility shall be designed to drain down within seventy-two (72) hours through a seepage bed.

6. Facilities should have a means of access for cleanout of accumulated debris or sediment.
7. Septic tank-type structures are recommended for smaller facilities.

**D. OTHER METHODS OF STORMWATER INFILTRATION**

Other methods of stormwater infiltration including: multiple, staged, or extended detention (i.e. greater than 24 hours), wet ponds with stormwater detention capabilities, infiltration trenches and basins, porous pavement, and vegetative practices including urban forestry, basin landscaping, or shallow marsh creation may be used. Suggested guidelines and design criteria for these alternatives are outlined in the publications Controlling Urban Runoff - A Practice Manual for Planning and Designing Urban BMPs (Metropolitan Washington Council of Governments), Standards and Specifications for Infiltration Practices (MD DNR), and the Pennsylvania Stormwater Best Management Practices Manual (PA DEP). All design methods and selected alternates shall have prior approval of the Municipality and its Engineer.

**V. GRADING AND LANDSCAPING**

**A. CUTS:**

No excavation should be made with a cut face steeper than three (3) feet horizontal to one (1) foot vertical, except under the conditions that the material in which the excavation is made is sufficiently stable to sustain a slope of steeper than three (3) feet horizontal to one (1) foot vertical; or as otherwise approved by the Municipality and its Engineer. Earth retaining structures will be required if a stable slope cannot be maintained. Any earth retaining structure design must be reviewed and approved by the Municipality and its Engineer. The top of the slope of any cut must be located a minimum of ten (10) feet from property lines.

**B. FILLS:**

No fill shall be made which creates any exposed surface steeper in slope than three (3) feet horizontal to one (1) foot vertical, except where the fill is located so that settlement, sliding, or erosion will not result in property damage; or be a hazard to adjoining property, streets, or buildings; or as otherwise approved by the Municipality and its Engineer. For an exposed surface steeper than 3:1 to be permitted, the Applicant/Developer must provide documentation that the 3:1 slope is not a safety concern.



**C. RETAINING WALLS:**

A concrete or stone masonry wall designed and constructed in accordance with these specifications and standards may be required to support the face of the cut or fill where the above-specified slopes are exceeded. All retaining walls shall be designed in accordance with all applicable municipal building codes and zoning requirements.

**D. PLANTING:**

1. Grassed or Grass/Ground Cover Combinations:

All such areas specified on proposed or approved plans shall be prepared, installed, and maintained in accordance with the approved erosion and sediment pollution control plan for the project, the Erosion and Sediment Pollution Control Program Manual (PA DEP), the Erosion and Sediment Pollution Control Best Management Practice (BMP) Manual, (PA DEP), or the current edition of PA DOT Publication 408 Specifications.

2. Open Space, Storm Drainage, and Retention Areas:

- a. All areas proposed for recreational use, whether active or passive, shall be planted to effectively naturalize the areas to become an integral and harmonious element in the natural landscape.
- b. All storm drainage channels and retention areas, whether existing or proposed, shall be graded and planted to effectively naturalize area(s) so as to become an integral and harmonious part of the landscape by contour and type of plant material employed.
- c. To work properly, any filter strip(s) must be equipped with some sort of level spreading device; densely vegetated with a mix of erosion resistant plant species that effectively bind the soil; graded to a uniform, even, and relatively low slope; be at least as long as the contributing area; and topsoil within the vegetative filter path be 12 inches to 18 inches deep.

A dense cover of erosion resistant grass suitable to existing site conditions shall be established, including Kentucky 31 Tall Fescue where drought resistance is required, or Reed Canary grass where water tolerance is required.

- d. A minimum of six (6) inches of topsoil material shall be placed on all areas affected by the basin construction (bottom of basin, side slopes,

top of berm, etc.). The material must meet the requirements of the current edition of PA DOT Publication 408 Specifications.

- e. Detention basins may not be seeded with crown vetch if, in the opinion of the Municipality and its Engineer, a crown vetch covering would reduce the use of the detention basin for recreational purposes or would be unsightly.
- f. A fence or suitable vegetative screening may be provided, as required by the Municipality and its Engineer, around all detention basins. All fencing should be at least three and one-half (3½) feet in height as approved by the Municipality and its Engineer. A vegetative screening of suitable landscaping plant material in or around a detention basin may also be required. Vegetative screenings should generally provide a barrier to prevent entrance to, and effectively naturalize the appearance of, the detention basin area.
- g. Combinations of grassed areas and densely planted shrub areas consisting of species suited to use in the highway environment are encouraged. Species of raspberry (*Rubus* spp.) are recommended.

**E. BUILDING SITE EXCAVATION AND SURFACE STORMWATER RUNOFF:**

1. If temporary or permanent diversion channels or berms have not been established during general site preparation, diversion channels or berms shall be installed whenever slopes exceed ten (10) percent above or below proposed excavation areas.

Installation shall occur prior to, or concurrent with, excavations or other earthmoving on the uphill or downhill sides of the building location, and any other areas to be disturbed. This requirement may be waived if it would result in the destruction of trees and shrubs. In all cases, hay bales or silt fence shall be installed and maintained downhill of all excavations until the diversion channels or berms required by the Municipality and its Engineer have been stabilized.

2. All exposed earth shall be stabilized with appropriate grasses or other materials immediately upon the completion of final grading.
3. Earth excavated for foundations or other reasons should be used for construction of diversion berms or decentralized detention basins.

## **APPENDIX B**

### **PROHIBITIONS**

#### **I. PROHIBITED DISCHARGES**

No person (as defined in the Storm Water Management Act, Act of October 4, 1978, P.L. 864 Number 167, 32 P.S. §680.1 et seq. [as amended]) shall allow, or cause to allow:

- Non-stormwater discharges into any stormwater conveyance system or into any waters of the Commonwealth;
- The connection of any non-stormwater conveyance to a stormwater conveyance system;
- The alteration of any stormwater management BMP without written approval by the Municipality.

#### **II. AUTHORIZED DISCHARGES**

A. The following discharges are authorized, unless the Municipality or PA DEP determines that they are significant contributors of pollution to waters of the Commonwealth:

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground waters
- Uncontaminated groundwater infiltration (as defined at 40 CFR 35.2005(20))
- Uncontaminated pumped groundwater
- Discharges from potable water sources
- Foundation drains
- Air conditioning condensation
- Irrigation water
- Springs
- Water from crawl space pumps
- Footing drains
- Lawn watering
- Individual residential car washing
- Flow from riparian habitats and wetlands
- Dechlorinated swimming pool discharges
- Street wash water
- Discharges from firefighting activities

- B. In the event that the Municipality and/or PA DEP determines that any of the above authorized discharges significantly contribute to pollution to waters of the Commonwealth, the Municipality and/or PA DEP will notify the Responsible Party to cease the discharge.
- C. Upon notice by the Municipality and/or PA DEP to cease a discharge, the discharger will have a reasonable time (as determined by the Municipality and/or PA DEP) to cease the discharge, and said time to cease the discharge will be determined by the degree of pollution caused by the discharge.
- D. Nothing herein shall affect a discharger's responsibilities under applicable State law.

## APPENDIX C

### SUPPLEMENTAL STANDARDS AND CRITERIA

The following technical reference materials (including any amendments and/or revisions thereto) are hereby incorporated into this Ordinance for information purposes, and to govern the hydrologic and hydraulic design provisions contained herein:

Controlling Urban Runoff - A Practice for Planning and Designing Urban Best Management Practices, Metropolitan Washington, Council of Governments, July 1987.

Specifications, Publication 408, Commonwealth of Pennsylvania, Department of Transportation (current edition).

Design and Construction of Urban Stormwater Management Systems, American Society of Civil Engineers and The Water Environment Federation, 1992.

Design of Roadside Channels with Flexible Linings (Hydraulic Engineering Circular No. 15), United States Department of Transportation, Federal Highway Administration, April 1988.

Design Manual Part 2 - Highway Design, Publication 13M, Commonwealth of Pennsylvania, Pennsylvania Department of Transportation, Bureau of Design (current edition).

Drainage of Highway Pavements (Hydraulic Engineering Circular No. 12), United States Department of Transportation, Federal Highway Administration, March 1984.

Engineering Field Manual for Conservation Practices - Part 1 of 2, United States Department of Agriculture, Natural Resource Conservation Service, July 1984.

Engineering Standard and Specifications, United States Department of Agriculture, Natural Resource Conservation Service, May 1977.

Erosion and Sediment Pollution Control Best Management Practice (BMP) Manual, Pennsylvania Department of Environmental Protection (current edition).

Erosion and Sediment Pollution Control Program Manual, Pennsylvania Department of Environmental Protection (current edition).

Flood Hazard Boundary Map; for Fairfield Township, PA; United States Department of Housing and Urban Development; Federal Insurance Administration (current edition).

Guidelines for Erosion and Sediment Control Planning and Implementation, United States Government Printing Office, Washington, DC, EPA-R2-72-015, August 1972.

Maryland Standards and Specifications for Soil Erosion and Sediment Control, Maryland Department of the Environment, Soil Conservation Service, State Soil Conservation Committee (current edition).

National Engineering Handbook, Part 630 - Hydrology, United States Department of Agriculture, Natural Resource Conservation Service (current edition).

NOAA Atlas 14, Precipitation-Frequency Atlas of the United States, Volume 2, Version 3, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, 2004, Revised 2006.

Open Channel Hydraulics, Ven T. Chow, McGraw-Hill, New York, 1959.

Pennsylvania Stormwater Best Management Practices Manual, Pennsylvania Department of Environmental Protection, December 2006.

Practices in Detention of Urban Stormwater Runoff, Special Report No. 43, American Public Works Association, June 1974.

The Rational Formula Revisited, Ronald L. Rossmiller, Ph.D., P.E., Proceedings International Symposium on Urban Storm Runoff, University of Kentucky, Lexington, Kentucky, July 28-31, 1980.

Soil Survey of Lycoming County, Pennsylvania, United States Department of Agriculture, Soil Conservation Service (current edition).

Stability Design of Grass-Lined Open Channels, Agriculture Handbook Number 667, United States Department of Agriculture, Agriculture Research Service, September 1987.

Standards for Roadway Construction, Series RC-0M to 100M, Publication 72M, Commonwealth of Pennsylvania, Department of Transportation (current edition).

Standards and Specifications for Infiltration Practices, Maryland Department of Natural Resources, Water Resources Administration, 1984.

Title 25 Rules and Regulations, Chapter 105, Dam Safety and Waterway Management; Commonwealth of Pennsylvania, Department of Environmental Protection (current edition).

Urban Drainage Design Manual, Hydraulic Engineering Circular Number 22, United States Department of Transportation, Federal Highway Administration, November 1996.

Urban Hydrology for Small Watersheds, Technical Release No. 55, United States Department of Agriculture, Natural Resource Conservation Service, June 1986.

Urban Stormwater Management, American Public Works Association, 1981.