

FILE OF THE CITY CLERK

ADMINISTRATION ORDINANCE NO. 3-2015

ADMINISTRATION BILL NO. 3-2015

INTRODUCED – FEBRUARY 10, 2015

ADOPTED BY COUNCIL – _____, 2015

AN ORDINANCE OF THE CITY OF LANCASTER
RESTATING CHAPTER 260 OF THE CODE OF THE CITY
LANCASTER – STORMWATER MANAGEMENT AND
PROVIDING FOR THE MEANS AND TIMING OF ITS
IMPLEMENTATION.

NOW, THEREFORE, BE AND IT IS HEREBY ORDAINED AND ENACTED by
the City Council of the City of Lancaster, Lancaster County, Pennsylvania, as follows:

SECTION 1. Chapter 260 of the Code of the City of Lancaster be and hereby is
reinstated as follows:

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**ARTICLE I
GENERAL PROVISIONS**

Section 260-101. Short Title

This Ordinance shall be known and may be cited as the “The City of Lancaster Stormwater Management (SWM) Ordinance.”

Section 260-102. Statement of Findings

The Lancaster City Council finds that:

- A. Inadequate management of accelerated storm water runoff resulting from development throughout a watershed increases flood flows and velocities, contributes to erosion and sedimentation, overtaxes the carrying capacity of existing streams and storm sewers, greatly increases the cost of public facilities to convey and manage storm water, undermines floodplain management and flood reduction efforts in upstream and downstream communities, reduces groundwater recharge, and threatens public health and safety.
- B. A comprehensive program of storm water management, including reasonable regulation of development and activities causing accelerated erosion, is fundamental to the public health, safety, welfare, and the protection of the people of the City of Lancaster and all the people of the Commonwealth, their resources, and the environment.
- C. Stormwater is an important water resource, which provides groundwater recharge for water supplies and base flow of streams, which also protects and maintains surface water quality.
- D. Federal and state regulations require certain Cities to implement a program of stormwater controls. These cities are required to obtain a permit for stormwater discharges from their Municipal Separate Storm Sewer Systems (MS4) under the National Pollutant Discharge Elimination System (NPDES).
- E. Riparian forest buffers enhance water quality by filtering pollutants in runoff, providing light control and temperature moderation, processing pollutants, increasing infiltration and providing channel and shoreline stability thus decreasing erosion (DEP Riparian Forest Buffer Guidance, November 27, 2010).
- F. Much of the City is served by a combined sewer system that collects and transports both domestic sewage and rainwater that flows from impervious surfaces such as roofs, streets, and parking lots. The City’s Advanced Wastewater Treatment Facility is normally able to manage and clean the volume of wastewater flowing through the combined sewer system; however, during intense rainstorms and other wet weather events, the system becomes

overwhelmed causing untreated wastewater to overflow into the Conestoga River. These events are referred to as combined sewer overflows.

Section 260-103. Purpose

The purpose of this Ordinance is to promote health, safety, and welfare within the City of Lancaster by minimizing the damages described in Section 260-101 of this Ordinance through provisions designed to:

- A. Manage accelerated runoff and erosion and sedimentation problems at their source by regulating activities that cause these problems.
- B. Utilize and preserve the existing natural drainage systems.
- C. Encourage recharge of groundwater where appropriate and prevent degradation of groundwater quality.
- D. Maintain existing flows and quality of streams, watercourses and water conveyance facilities in the City of Lancaster and the Commonwealth.
- E. Preserve and restore the flood-carrying capacity of streams.
- F. Provide proper Operation and Maintenance of all Stormwater Management Best Management Practices (SWM BMPs) that are implemented within the City.
- G. Provide performance standards and design criteria for watershed-wide storm water management and planning.
- H. Meet legal water quality requirements under state law, including regulations at 25 Pa. Code Chapter 93 to protect, maintain, reclaim, and restore the existing and designated uses of the Waters of the Commonwealth
- I. Prevent scour and erosion of stream banks and streambeds.
- J. Provide standards to meet NPDES permit requirements.
- K. Help preserve and protect exceptional natural resources, and conserve and restore natural resource systems.
- L. Promote stormwater management practices that emphasize infiltration, evaporation, and transpiration.
- M. Reduce Combined Sewer Overflows.

Section 260-104. Statutory Authority

A. Primary Authority:

The City of Lancaster is empowered to regulate land use activities that affect runoff by the authority of the Act of October 4, 1978, 32 P.S. P.L. 864 (Act 167), Section 680.1, et. seq., as amended, the “Storm Water Management Act”; the Pennsylvania Floodplain Management Act, and the Federal Clean Water Act (33 U.S.C.A. §1342, 40 CFR §§ 122.26 – 123.35).

B. Secondary Authority:

The City also is empowered to regulate land use activities that affect runoff by the authority of the Act of July 31, 1968, P.L. 805, No. 247, The Pennsylvania Municipalities Planning Code (MPC), as amended.

Section 260-105. Applicability

This Ordinance shall apply to all development and land disturbance within all watershed areas of the City of Lancaster, as delineated on the City of Lancaster Watersheds Map¹, Appendix A.

This Ordinance shall apply to permanent stormwater management facilities constructed as part of any of the Regulated Activities listed in this Section and to storm water management and erosion and sediment control during construction activities.

Refer to current E&S and NPDES requirements in Appendix E.

The following activities are identified as “Regulated Activities” and shall be regulated by this Ordinance unless shown as exempt under Section 260-502:

- A. Land Disturbance
- B. Land Development
- C. Subdivision
- D. Construction of new or additional impervious or semi-pervious surfaces (driveways, parking lots, etc.)
- E. Construction of new buildings or additions to existing buildings
- F. Diversion or piping of any natural or man-made stream channel

¹ The City of Lancaster is located within the following watersheds: Little Conestoga; Conestoga; Mill Creek.

G. Installation of stormwater management facilities or appurtenances thereto

Section 260-106. Repealer; Repeals and Continuation of Prior Regulations.

- A. Except as otherwise required by law, this Ordinance is intended as a continuation of, and not a repeal of, existing regulations governing the subject matter. To the extent that this Ordinance restates regulations contained in ordinances previously enacted by the City of Lancaster, this Ordinance shall be considered a restatement and not a repeal of such regulations. It is the specific intent of the City of Lancaster that all provisions of this Ordinance shall be considered in full force and effect as of the date such regulations were initially enacted. All ordinances or parts of ordinances inconsistent with the provisions of this Ordinance are hereby repealed. It is expressly provided that the provisions of this Ordinance shall not affect any act done, contract executed or liability incurred prior to its effective date, or affect any suit or prosecution pending or to be instituted to enforce any rights, rule, regulation or ordinance, or part thereof, or to punish any violation which occurred under any prior storm water regulation or ordinance. In the event any violation has occurred under any prior stormwater regulation or ordinance of the city of Lancaster, prosecution may be initiated against the alleged offender pursuant to the provisions of said prior stormwater regulation or ordinance, and the provisions and penalties provided in said prior stormwater regulation or ordinance shall remain effective as to said violation.

- B. Any Plan (hereinafter defined) pending at the time of the effective date of this Ordinance shall be allowed to proceed with revisions, finalization and implementation in accordance with any ordinance in effect prior hereto. Any Subdivision and Land Development Plan filed pursuant to the provisions of the Pennsylvania Municipalities Planning Code where there isn't a prior storm water management ordinance in effect may proceed with development in accordance with the filing at the time of the effective date of this Ordinance.

Section 260-107. Severability

Should any section, provision or part thereof 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 260-108. Compatibility with Other Ordinance Requirements

- A. Approvals issued pursuant to this Ordinance do not relieve the Applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable law, regulation, code, rule, act, or ordinance.

- B. All improvements required by this Ordinance shall be designed and constructed in conformance with this Ordinance and the Ordinances for the City of Lancaster, and the technical standards set forth in the "Construction Specifications and Guidelines Manual of the City of Lancaster," which standards and guidelines are incorporated herein by reference as if fully set forth, unless the appropriate City official with authority to review the proposed construction designates an alternative method or standard. Except as specifically provided for in this Ordinance, nothing contained in this Ordinance shall be construed to affect the other ordinances of the City of Lancaster. The "Construction Specifications and Guidelines Manual of the City of Lancaster" is on file in the office of the City Clerk, and the City Department of Economic and Community Development, Bureau of Planning, where copies are available for public examination.
- C. In their interpretation and application, the provisions of this Ordinance shall be held to be minimum requirements, adopted for the promotion of the public health, safety and general welfare. Whenever the requirements of this Ordinance are at variance with the requirements of any other lawfully adopted laws, acts, rules, regulations, ordinances, deed restrictions or covenants, the most restrictive or that imposing the highest standards, shall govern.

Section 260-109. 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 and shall be enforced in accordance with Article IX, Enforcement and Penalties. No action may be taken by a board, agency or employee of the City purporting to validate such a violation.

Section 260-110. City Liability.

Except as specifically provided by the Pennsylvania Storm Water Management Act, Act of October 4, 1978, P.L. 864, No. 167, as amended, 32 P.S. §680.1 et seq., the making of any administrative decision by the City of Lancaster or any of its officials or employees shall not constitute a representation, guarantee or warranty of any kind by the City of Lancaster of the practicability or safety of any proposed structure or use with respect to damage from erosion, sedimentation, storm water runoff, flood, or any other matter, and shall create no liability upon or give rise to any cause of action against the City of Lancaster and its officials and employees. The City of Lancaster, by enacting and amending this Ordinance, does not waive or limit any immunity granted to the City of Lancaster and its officials and employees by the Governmental Immunity Act, 42 Pa. C.S. §8541 et seq., and does not assume any liabilities or obligations.

Section 260-111. Duty of Persons Engaged in the Development of Land

Notwithstanding any provision(s) of this Ordinance, including exemptions, any landowner or any person engaged in the alteration or development of land which may affect stormwater runoff characteristics shall implement such measures as are reasonably necessary to prevent injury to health, safety, or other property. Such measures also shall include actions as are required to manage the rate, volume, direction, and quality of resulting stormwater runoff in a manner which otherwise adequately protects health, safety and welfare.

Section 260-112. Financial security

- A. A financial security (bond, restricted escrow or letter of credit) for stormwater related improvements shall be supplied by the Applicant in conjunction with any subdivision/land development approval, or in conjunction with the SWM Site Plan approval if no subdivision/land development plan is required, except Very Small Projects, as defined in this Ordinance shall be exempt from this requirement.
- B. The applicant shall provide a financial security to the City of Lancaster for the timely installation and proper construction of all SWM facilities except for Very Small Projects, as defined herein, including E&S BMPS, as required by the approved SWM Site Plan and this Ordinance and, as applicable, in accordance with the provisions of Sections 509, 510, and 511 of the MPC.
- C. As the work of installing the required SWM Facilities proceeds, the party posting the financial security may request the City of Lancaster to release or authorize the release, from time to time, such portions of the financial security necessary for payment to the contractor or contractors performing the work. Any such requests shall be in writing addressed to the City of Lancaster, and the City of Lancaster shall have forty-five (45) days from receipt of such request within which to allow the City Engineer to certify, in writing, to the City of Lancaster that such portion of the work upon the SWM Facilities has been completed in accordance with the approved SWM Site Plan. Upon such certification the City of Lancaster shall authorize release by the bonding company or lending institution of an amount as estimated by the City Engineer fairly representing the value of the SWM Facilities completed. The City of Lancaster may, prior to final release at the time of completion and certification by its Engineer, require retention of not more than fifteen percent (15%) of the estimated cost of the aforesaid SWM Facilities for eighteen (18) months.
- D. In the event that any SWM Facilities which may be required have not been installed as provided in the approved SWM Site Plan the Planning Commission of the City of Lancaster is hereby granted the power to enforce any corporate bond, or other security by appropriate legal and equitable remedies. If proceeds of such bond, or other security are insufficient to pay the cost of installing or making repairs or corrections to all the SWM Facilities covered by said security, the Planning commission of the City of Lancaster may, at its option, install part of such SWM Facilities and may institute appropriate legal or equitable action to recover the

monies necessary to complete the remainder of the SWM Facilities. All of the proceeds, whether resulting from the security or from any legal or equitable action brought against the Applicant, or both, shall be used solely for the installation of the SWM Facilities covered by such security, and not for any other City purpose.

ARTICLE II DEFINITIONS OF TERMS

Section 260-201. Interpretation and Word Usage

The language set forth in the text of this Ordinance shall be interpreted in accordance with the following rules of construction:

- A. Words used or defined in one tense or form shall include other tenses or derivative forms.
- B. Words in the singular number shall include the plural number, and words in the plural number shall include the singular number.
- C. The masculine gender shall include the feminine and neuter. The feminine gender shall include the masculine and neuter. The neuter gender shall include the masculine and feminine.
- D. The word "person" includes individuals, firms, partnerships, joint ventures, trusts, trustees, estates, corporations, associations and any other similar entities.
- E. The word "Lot" includes the words "plot", "Tract", and "Parcel".
- F. The words "shall," "must" and "will" are mandatory in nature and establish an obligation or duty to comply with the particular provision. The words "may" and "should" are permissive.
- G. The time, within which any act required by this Ordinance is to be performed, shall be computed by excluding the first day and including the last day. However, if the last day is a Saturday or Sunday or a holiday declared by the United States Congress or the Pennsylvania General Assembly, it shall also be excluded. The word "day" shall mean a calendar day, unless otherwise indicated.
- H. Any words not defined in this Ordinance or in Section 107 of the MPC shall be construed as defined in standard dictionary usage.
- I. References to officially adopted regulations, standards, or publications of DEP or other governmental agencies shall include the regulation, publication, or standard in effect on the date when a SWM Site Plan is first filed. It is the intent of the City of Lancaster in enacting this Section to incorporate such changes to statutes, regulations, and publications to the extent authorized by 1 Pa. C.S. § 1937.

Section 260-202. Definitions of Terms

Accelerated Erosion - The removal of the surface of the land through the combined action of

man's activity and the natural processes at a rate greater than would occur because of the natural process alone.

Access Easement – A right granted by a landowner to a grantee, allowing entry for the purpose of inspecting, maintaining and repairing SWM Facilities.

Act 167 Plan – A plan prepared under the authority of Pennsylvania's Stormwater Management Act of October 4, 1978.

Agricultural Activity – Activities associated with agriculture such as agricultural cultivation, agricultural operation, and animal heavy use areas. This includes the work of producing crops and raising livestock including tillage, land clearing, plowing, disking, harrowing, planting, harvesting crops, or pasturing and raising of livestock and installation of Conservation Practices. Construction of new buildings or impervious areas is not considered an agricultural activity.

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; earth disturbance activity.

Applicant - A Landowner and/or Developer, as hereinafter defined, including his heirs, successors and assigns, who has filed an application to the City of Lancaster for approval to engage in any regulated activity at a Development Site located within the City of Lancaster.

BMP (Best Management Practice) - Activities, facilities, control measures, planning or procedures used to minimize accelerated erosion and sedimentation and manage stormwater to protect, maintain, reclaim, and restore the quality of waters and the existing and designated uses of waters within this Commonwealth before, during and after earth disturbance activities¹. See also Non-structural BMP and Structural BMP.

BMP Manual – The Pennsylvania Stormwater Best Management Practices Manual of December 2006, or most recent version thereof.

Building – Any structure which is enclosed and isolated by exterior walls and roof, built or used for residential, commercial, industrial or other public or private purposes, including accessory structures. Where the context requires, the word "building" shall be construed as if followed by the words "or part or parts thereof." For the purposes of this chapter, each portion of a structure separated from other portions by a fire wall shall be considered as a separate building. (Per Lancaster City SALDO)

Carbonate Geology - Limestone or dolomite bedrock. Carbonate geology is often associated with karst topography.

Certificate of Completion – Documentation verifying that all permanent SWM facilities have been constructed according to the plans and specifications and approved revisions thereto.

Pa. Code Chapter 102 – 25 Pa. Code Chapter 102, Erosion and Sediment Control

Pa. Code Chapter 105 – 25 Pa. Code, Chapter 105, Dam Safety and Waterway Management

Pa. Code Chapter 106 – 25 Pa. Code, Chapter 106, Floodplain Management

Cistern - A reservoir or tank for storing rainwater.

City - The City of Lancaster, Pennsylvania or its designee.

City Engineer - A professional engineer registered by the Commonwealth of Pennsylvania and employed or retained by the City and designated as the City Engineer.

Clean Water Act – Amendments to the Federal Water Pollution Control Act, P.L. 92-500 of 1972, 33 U.S.C. §1251 et seq.

Combined Sewer Overflow - Intermittent overflow or other untreated discharge from a combined sewer system during periods of heavy rainfall.

Combined Sewer System – A type of sewer system that collects sanitary sewage and stormwater runoff in a single pipe system.

Conservation Plan – A plan written by an NRCS certified planner that identifies Conservation Practices and includes site specific BMPs for agricultural plowing or tilling activities and Animal Heavy Use Areas.

Conservation Practices – Practices installed on agricultural lands to improve farmland, soil and/or water quality which have been identified in a current Conservation Plan.

Contributory drainage area - The total area that contributes runoff to a given point of discharge.

Conveyance – (n) Any structure that carries a flow. (v) The ability of a pipe, culvert, swale or similar facility to carry the peak flow from the design storm.

Culvert - A structure with appurtenant works which can convey a stream under or through an embankment or fill.

DEP also PA DEP or PADEP – The Pennsylvania Department of Environmental Protection or any agency successor to the Pennsylvania Department of Environmental Protection.

Design Storm - The magnitude and temporal distribution of precipitation from a storm event measured in probability of occurrence (e.g., a 5-year storm) and duration (e.g., 24-hours), used in the design and evaluation of SWM systems.

Design Storm Depth – The amount of rainfall, based on the Design Storm Method described in

§260-303.A, that can be captured and infiltrated in a particular BMP.

Detention Basin - An impoundment structure designed to manage stormwater runoff by temporarily storing the runoff and releasing it at a controlled rate.

Developer - A person, partnership, association, corporation, or other entity, including governmental or municipal agency or authority that undertakes any regulated activity of this Ordinance.

Development Site (Site) - The specific area of land where regulated activities in the City of Lancaster are planned, conducted or maintained.

Director - The Director of the Department of Public Works or her or his designee.

Disappearing Stream - A stream in an area underlain by limestone or dolomite that flows underground for a portion of its length.

Disturbed Area - A land area where an earth disturbance activity is occurring or has occurred.

Drainage Area – See Contributory Drainage Area,

Drainage Easement - Rights to occupy and use another person's real property for the installation and operation of stormwater management facilities, or for the maintenance of natural drainage ways to preserve and maintain a channel for the flow of stormwater therein, or to safeguard health, safety, property, and facilities

E&S – Erosion and Sediment.

E&S Plan (also Erosion and Sediment Control Plan) – A site-specific plan consisting of both drawings and a narrative that identifies BMPs to minimize accelerated erosion and sedimentation before, during and after earth disturbance activities.

Earth Disturbance Activity - A construction or other human activity which disturbs the surface of the land, including, but not limited to: clearing and grubbing; grading; excavations; embankments; land development; agricultural plowing or tilling; operation of animal heavy use areas; timber harvesting activities; road maintenance activities; oil and gas activities; well drilling; mineral extraction; building construction; and the moving, depositing, stockpiling, or storing of soil, rock, or earth materials¹.

Environmentally Sensitive Area - slopes greater than 15% percent, shallow bedrock (located within 6 feet of ground surface²), wetlands, Natural Heritage Areas and other areas designated as Conservation or Preservation in **Greenscapes**, the Green Infrastructure Element of the County Comprehensive Plan, where encroachment by land development or land disturbance results in degradation of the natural resource.

Erosion - The natural process by which the surface of the land is worn away by water, wind, or chemical action. See also, “Accelerated Erosion” as defined above.

Existing Conditions - The dominant land cover during the 5-year period immediately preceding a proposed regulated activity.

FEMA - the Federal Emergency Management Agency.

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.

Flood Fringe – That portion of the floodplain outside of the floodway³.

Floodplain - Any land area susceptible to inundation by water from any natural source or delineated by applicable Department of Homeland Security, Federal Insurance Administration Flood Hazard Boundary - Mapped as being a special flood hazard area. Also, the area of inundation that functions as a storage or holding area for floodwater to a width required to contain a base flood of which there is a one percent (1%) chance of occurrence in any given year. The floodplain contains both the floodway and the flood fringe.

Floodplain Management Act - Act of October 4, 1978, P.L. 851, No. 166, as amended 32 P.S. § 679.101 et seq.

Floodway – That portion of the floodplain which is effective in carrying flow, within which this carrying capacity must be preserved and where the flood hazard is generally highest, i.e., where water depths and velocities are the greatest. It is that area which provides for the discharge of the base flood so the cumulative increase in water surface elevation is no more than one foot³.

Forest Management/Timber Operations - Planning and activities necessary for the management of forest land. These include conducting a timber inventory and preparation of forest management plans, silvicultural treatment, cutting budgets, logging road design and construction, timber harvesting, site preparation and reforestation.

Frequency - The probability or chance that a given storm event/flood will be equaled or exceeded in a given year.

Garden - A plot of ground where herbs, fruits, flowers, or vegetables are cultivated for personal use.

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

Green Infrastructure –Small-scale stormwater management practices, nonstructural techniques, and better site planning to mimic natural hydrologic runoff characteristics and minimize the impact

of development on water resources.

Groundwater Recharge - The process by which water from above the ground surface is added to the saturated zone of an aquifer, either directly or indirectly.

Hydrologic Soil Group (HSG) – Refers to soils grouped according to their runoff-producing characteristics by NRCS. There are four (4) runoff potential groups ranging from A to D.

- A. (Low runoff potential) Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands or gravels. These soils have a high rate of water transmission (greater than 0.30 inches/hour).
- B. Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well-to-well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission (from 0.15 to 0.30 inches/hour).
- C. Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of soils with a layer that impedes downward movement of water, or soils with moderately fine to fine texture. These soils have a slow rate of water transmission (from 0.05 to 0.15 inches/hour).
- D. (High runoff potential) Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a clay pan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission (from 0 to 0.05 inches/hour).

Impervious Surface (Impervious Area) – Surface which prevents or limits the infiltration of water into the ground. Any structure, building, parking area, driveway, road, street, sidewalk, patio, deck, and any area of concrete, asphalt, pavement, compacted gravel, packed stone, stone, brick, tile, swimming pool, or artificial turf, and highly compacted soil shall be considered “impervious surface” if they prevent or limit infiltration. Impervious surface also includes any area used by or for motor vehicles or heavy commercial equipment, regardless of surface type or material, including any road, road shoulder, driveway, or parking area.

Impoundment - A retention or detention facility designed to retain stormwater runoff and infiltrate it into the ground (in the case of a retention basin) or release it at a controlled rate (in the case of a detention basin).

Infiltration Structures - A structure designed to direct runoff into the ground (e.g. French drains, seepage pits, seepage trench, rain gardens, vegetated swales, pervious paving, infiltration basins, etc.).

Inlet - A surface connection to a closed drain. The upstream end of any structure through which

water may flow.

Intermittent – A natural, transient body or conveyance of water that exists for a relatively long time, but for weeks or months of the year is below the local water table and obtains its flow from both surface runoff and groundwater discharges.

Invasive Vegetation (Invasives) – Plants which grow quickly and aggressively, spreading, and displacing other plants. Invasives typically are introduced into a region far from their native habitat. See [Invasive Plants in Pennsylvania](#) by the Department of Conservation and Natural Resources.

Karst - A type of topography or landscape characterized by features including but not limited to surface depressions, sinkholes, rock pinnacles/uneven bedrock surface, underground drainage, and caves. Karst is formed on carbonate rocks, such as limestone or dolomite.

Landscaping - The planting, configuration and maintenance of any combination of trees, ground cover, shrubbery and other vegetative plant material.

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:
 - a. 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; or
 - b. 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. Any subdivision of land.
3. Development in accordance with Section 503(1.1) of the Pennsylvania Municipalities Planning Code.

Land Disturbance – See Earth Disturbance Activity.

Landowner - The legal or beneficial owner or owners of land including the holder of an option or contract to purchase (whether or not such option or contract is subject to any condition), a lessee if he is authorized under the lease to exercise the rights of the landowner, or other person having a proprietary interest in land.

Limiting Zone - A rock formation, other stratum, or soil condition which is so slowly permeable that it effectively limits downward passage of effluent¹². Seasonal high water tables, whether perched or regional also constitute a limiting zone.

Lineament - A linear feature in a landscape which is an expression of an underlying geological structure such as a fault.

Manning's Equation - An equation for calculation of velocity of flow (e.g. feet per second) and flow rate (e.g. cubic feet per second) in open channels based upon channel shape, roughness, depth of flow and slope. Manning's Equation assumes steady, gradually varied flow.

Maximum Extent Practicable (MEP) – Applies when the applicant demonstrates to the City of Lancaster's satisfaction that the performance standard is not achievable. The applicant shall take into account the best available technology, cost effectiveness, geographic features, and other competing interests such as protection of human safety and welfare, protection of endangered and threatened resources, and preservation of historic properties in making the assertion that the performance standard cannot be met and that a different means of control is appropriate.⁵

MPC - The Pennsylvania Municipalities Planning Code, Act of 1968, P.L. 805, No. 247, as reenacted and amended, 53 P.S. Section 10101 et seq.

Municipal Separate Storm Sewer – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains), which is all of the following: (1) owned or operated by a state, city, town, borough, township, county, district, association or other public body (created under state law) having jurisdiction over disposal of sewage, industrial wastes, stormwater or other wastes; (2) designed or used for collecting or conveying stormwater; (3) not a combined sewer; and (4) not part of a Publicly Owned Treatment Works as defined at 40 CFR § 122.2.

Municipal Separate Storm Sewer System (MS4): All separate storm sewers that are defined as "large" or "medium" or "small" municipal separate storm sewer systems pursuant to 40 CFR §§ 122.26(b)(18), or designated as regulated under 40 CFR § 122.26(a)(1)(v).

NRCS - Natural Resources Conservation Service (previously Soil Conservation Service, or SCS).

National Pollution Discharge Elimination System (NPDES) – The National system for the issuance of permits under section 402 of the Federal Clean Water Act (33 U.S.C.A. § 1342) including a state or interstate program which has been approved in whole or in part by the EPA, including the regulations codified in Pa. Code Chapter 92 (relating to National Pollutant Discharge Elimination System permitting, monitoring and compliance), and as specified in Pa Code Chapter 102.

Native Vegetation – Plant species that have evolved or are indigenous to a specific geographical area. These plants are adapted to local soil and weather conditions as well as pests and diseases.

Natural Drainageway - An existing channel for water runoff that was formed by natural processes.

Natural Ground Cover – Ground cover which mimics the infiltration characteristics of predominant hydrologic soil group found at the site.

Nonpoint Source Pollution - Any source of water pollution that does not meet the legal definition of "point source" in section 502(14) of the Clean Water Act.

Non-structural BMPs – Planning and design approaches, operational and/or behavior-related practices which minimize stormwater runoff generation resulting from an alteration of the land surface or limit contact of pollutants with stormwater runoff.

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 drainage ways, swales, streams, ditches, canals, and pipes flowing partly full. Open channels may include closed conduits so long as the flow is not under pressure.

Outfall - Point where water flows from a conduit, stream, pipe, or drain.

Overflow Event – See Combined Sewer Overflow

Peak Discharge - The maximum rate of stormwater runoff from a specific storm event.

PennDOT - The Pennsylvania Department of Transportation or any agency successor thereto.

Pervious Area (Permeable or Porous Surface) - Any material / surface that allows water to pass through at a rate equal to or greater than Natural Ground Cover.

Pipe - A culvert, closed conduit, or similar structure (including appurtenances) that conveys stormwater.

Plans - The SWM and erosion and sediment control plans and narratives.

Planning Commission - The planning commission of The City of Lancaster, Lancaster County, Pennsylvania.

Process Wastewater - Water that comes in contact with any raw material, product, by-product, or waste during any production or industrial process.

Qualified Person - Any person licensed by the Pennsylvania Department of State or otherwise qualified by law to perform the work required by this Ordinance.

Rate Control - SWM controls used to manage the peak flows for the purposes of channel protection and flood mitigation.

Rational Method (Rational Formula) - A rainfall-runoff relation used to estimate peak flow.

Redevelopment – Any physical improvement to a previously developed lot that involves earthmoving, removal, or addition of impervious surfaces.

Regional Stormwater Management Plan – A plan to manage stormwater runoff from an area larger than a single Development Site. A Regional Stormwater Management Plan could include two adjacent parcels, an entire watershed, or some defined area in between. Regional Stormwater Management Plans can be prepared for new development, or as a retrofit to manage runoff from already developed areas.

Regulated Activities - Activities, including Earth Disturbance Activities that involve the alteration or development of land in a manner that may affect stormwater runoff. Regulated activities shall include, but not be limited to:

- Land Development subject to the requirements of the City of Lancaster Subdivision and Land Development Ordinance;
- Removal of ground cover, grading, filling or excavation; replacing existing impervious surface with new (reconstructed) impervious surface such as repairs to parking lots, that require disturbing the stone base of the parking lot.;
- Construction of new or additional impervious or semi-impervious surfaces (driveways, parking lots, etc.), and associated improvements;
- Construction of new buildings or additions to existing buildings;
- Installation or alteration of stormwater management facilities and appurtenances thereto;
- Diversion or piping of any watercourse;
- Demolition or razing of all or a portion of an existing structure; and,
- Any other regulated activities where the City of Lancaster determines that said activities may affect any existing watercourse's stormwater management facilities, or stormwater drainage patterns.

Release Rate – For a specific design storm or list of design storms, the percentage of peak flow rate for existing conditions which may not be exceeded for the proposed conditions.

Release Rate Map – A graphical representation of the release rates for a specific area.

Retention Basin - A Stormwater Management Facility that includes a permanent pool for water quality treatment and additional capacity above the permanent pool for temporary runoff storage.

Riparian – Pertaining to a stream, river or other watercourse. Also, plant communities occurring in association with any spring, lake, river, stream or creek through which waters flow at least periodically⁶.

Riparian Buffer – A BMP that is an area of permanent vegetation along a watercourse.

Riparian Corridor – A narrow strip of land, centered on a stream or river that includes the floodplain as well as related riparian habitats adjacent to the floodplain⁶.

Riparian Corridor Easement – An easement created for the purpose of protecting and preserving a Riparian Corridor.

Riparian Forest Buffer – A type of Riparian Buffer that consists of permanent vegetation that is predominantly native trees, shrubs and forbs along a watercourse that is maintained in a natural state or sustainably managed to protect and enhance water quality, stabilize stream channels and banks, and separate land use activities from surface waters.

Rooftop Detention - Temporary ponding and gradual release of stormwater falling directly onto roof surfaces by incorporating controlled-flow roof drains into building designs.

Runoff - Any part of precipitation that flows over the land surface.

SCS - U.S. Department of Agriculture, Soil Conservation Service (now known as NRCS).

Sediment – Soils or other materials transported by stormwater as a product of erosion¹.

Sediment Basin - A barrier, dam, retention or detention basin located and designed to retain rock, sand, gravel, silt, or other material transported by water.

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 action or process of forming or depositing sediment in Waters of the Commonwealth¹.

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.

Semi-impervious / Semi-pervious surface - A surface which prevents some infiltration of water into the ground.

Sheet Flow - Runoff which flows over the ground surface as a thin, even layer, not concentrated in a channel.

Small Project – Regulated activities that, measured on a cumulative basis, create additional impervious areas of 1,000 sq. ft. or less or involve removal of ground cover, grading, filling or excavation of an area less than 5,000 sq. ft. and do not involve the alteration of stormwater facilities or watercourses.

Small Storm Event – A storm having a frequency of recurrence of once every two (2) years or smaller.

Soil-Cover Complex Method - A method of runoff computation developed by the SCS (now NRCS) that is based on relating soil type and land use/cover to a runoff parameter called Curve Number (CN). For more information, see “Urban Hydrology for Small WATERSHEDS”, Second edition, Technical Release No. 55, SCS, June 1986 (or most current edition).

Soil Group, Hydrologic - See “Hydrologic Soil Group”.

Spec Manual – The Lancaster City Specifications and Guidelines Manual.

State Water Quality Requirements - The regulatory requirements to protect, maintain, reclaim, and restore water quality under Title 25 of the Pennsylvania Code, the Clean Streams Law and the Clean Water Act.

Storage – A volume above or below ground that is available to hold stormwater.

Storm event - A storm of a specific duration, intensity, and frequency.⁷

Storm Sewer - A system of pipes and/or open channels designed to convey stormwater.

Stormwater - Drainage runoff from the surface of the land resulting from precipitation or snow or ice melt.

Stormwater Credit – A reduction in the cost to construct the required stormwater management facility.

Stormwater Management Act (Act 167) - Act of October 4, 1978, P.L. 864, No. 167, as amended 32 P.S. Section 680.1 et seq. This stormwater act shall also be referred to herein as Act 167.

Stormwater Management Best Management Practices (SWM BMP) – See **BMPs**.

Stormwater Management Facility (SWM Facility) - Any structure, natural or man-made, that, due to its condition, design, or construction, conveys, stores, infiltrates/evaporates/transpires, cleans or otherwise affects stormwater runoff. Typical SWM facilities include, but are not limited to, detention and retention basins, open channels, watercourses, road gutters, swales, storm sewers, pipes, BMPs, and infiltration structures.

Stormwater Management Operation and Maintenance Plan (O & M Plan) – A plan, including a narrative, to ensure proper functioning of the SWM facilities in accordance with Article VI of this Ordinance.

Stormwater Management Site Plan (SWM Site Plan) - The Plan prepared by the Applicant or his representative indicating how stormwater runoff will be managed at a particular development site according to this Ordinance.

Stream – A watercourse

Structural BMPs – Physical devices and practices that capture and treat stormwater runoff. Structural stormwater BMPs are permanent appurtenances to the Development Site.

Structure – Any man-made object having an ascertainable stationary location on or in land or water, whether or not affixed to the land.⁸

Subdivision - The division or re-division of a single Lot, Tract or Parcel of land by any means into two (2) 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 Land Development or as defined in the MPC.

Swale - A low lying stretch of land which gathers or carries surface water runoff.

SWM – Stormwater Management.

SWM Site Plan – A Stormwater Management Site Plan.

Timber Operations - See Forest Management.

Time of Concentration (Tc) - 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 pipes or channels, if any. Or the time needed for water to flow from the most remote point in a watershed to the watershed outlet.

Top of streambank – First substantial break in slope between the edge of the bed of the stream and the surrounding terrain. The top of streambank can either be a natural or constructed (that is, road or railroad grade) feature, lying generally parallel to the watercourse.

Treatment Train – The sequencing of structural Best Management Practices to achieve optimal flow management and pollutant removal from urban stormwater.

USDA – United States Department of Agriculture.

Very Small Project – Regulated activities that have negligible impervious coverage of less than or equal to 100 square feet measured in aggregate. Very small projects shall include fence posts; mail box posts, tombstones; doghouses; pads for trash receptacles, and outdoor grills; lawn ornaments and other non-vegetative landscape elements.

Volume Control - SWM controls, or BMPs, used to remove a predetermined amount of runoff or the increase in volume between the pre- and post-development design storm.

Watercourse - A channel or conveyance of surface water having defined bed and banks, whether natural or artificial, with perennial or intermittent flow.

Watershed - The entire region or area drained by a watercourse.

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 Pennsylvania.

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.

Woodland – land predominantly covered with trees and shrubs. Without limiting the foregoing, Woodlands include all land areas of 10,000 square feet or greater, supporting at least 100 trees per acre, so that either (i) at least 50 trees are two inches or greater in [diameter at breast height] [(DBH)], or (ii) 50 trees are at least 12 feet in height.

**ARTICLE III
STORMWATER MANAGEMENT STANDARDS**

Section 260-301. General Requirements

- A. Preparation of a SWM Site Plan is required for all regulated activities, unless preparation and submission of the SWM Site Plan is specifically exempted according to Section 260-502.
- B. No regulated activities shall commence until the City of Lancaster issues unconditional written approval of a SWM Site Plan or Stormwater Permit.
- C. SWM Site Plans approved by the City of Lancaster, in accordance with Section 260-505, shall be on site throughout the duration of the regulated activity.
- D. The City of Lancaster may, after consultation with DEP, approve measures for meeting the state water quality requirements other than those in this Ordinance, provided that they meet the minimum requirements of, and do not conflict with, state law including, but not limited to, the Clean Streams Law. The City of Lancaster shall maintain a record of consultations with DEP pursuant to this paragraph. Where an NPDES permit for stormwater discharges associated with construction activities is required, issuance of an NPDES permit shall constitute satisfaction of consultation with DEP.
- E. For all regulated activities, erosion and sediment control BMPs shall be designed, implemented, operated, and maintained to meet the purposes and requirements of this Ordinance and to meet all requirements under Title 25 of the Pennsylvania Code and the Clean Streams Law. Various BMPs and their design standards are listed in the *Erosion and Sediment Pollution Control Program Manual* (E&S Manual), No. 363-2134-008 (March 2012), as amended and updated.
- F. Applicants have the option to propose a Regional Stormwater Management Plan or participate in a Regional Stormwater Management Plan developed by others. A Regional Stormwater Management Plan may include offsite volume and rate control, as appropriate and supported by a detailed design approved by the City of Lancaster in accordance with Section 260-301.D. A Regional Stormwater Management Plan must meet all of the volume and rate control standards required by this Ordinance for the area defined by the Regional Stormwater Management Plan, but not necessarily for each individual Development Site. Appropriate easement and O&M agreements must be established to ensure the requirements of this Ordinance and the requirements of the Regional Stormwater Management Plan are met.
- G. Unless prohibited by the City of Lancaster Building Construction and Floodplain Ordinance, Zoning Ordinance or any Ordinance which regulates construction and development within the areas of the City of Lancaster subject to flooding, and any other applicable requirements of the Floodplain Management Act, stormwater management facilities located in the floodplain are permitted when designed and constructed in accordance with the provisions of the BMP

Manual, the City Specifications and Guidelines Manual, Stormwater Management Fee Policy and Procedures Manual, other regulatory requirements and the requirements of this Ordinance.

H. Impervious areas:

1. The measurement of impervious area shall include all of the impervious areas in the total proposed development even if development is to take place in stages or phases.
2. For development taking place in stages or phases, the entire development plan must be used in determining conformance with this Ordinance.
3. Any areas designed to initially be gravel or crushed stone shall be assumed to be impervious.

I. All regulated activities shall include such measures as necessary to:

1. Protect health, safety, and welfare of people and property;
2. Meet the water quality goals of this Ordinance by implementing measures to:
 - a. Protect and/or improve the function of floodplains, wetlands, and wooded areas.
 - b. Protect and/or improve native plant communities including those within the riparian corridor.
 - c. Protect and/or improve natural drainageways from erosion.
 - d. Minimize thermal impacts to waters of the Commonwealth.
 - e. Disconnect impervious surfaces by directing runoff to pervious areas, wherever possible.
3. Incorporate the techniques for Low Impact Development Practices described in the Pennsylvania Stormwater BMP Manual (BMP Manual).
4. Incorporate green infrastructure stormwater management facilities in accordance with applicable City codes and specifications.

J. A planting plan is required for all vegetated stormwater BMPs.

1. All trees and other vegetation shall be planted in accordance with the standards and regulations set forth in applicable City codes and Ordinances including but not limited to Chapter 265, Subdivision and Land Development Ordinance, Chapter 273, Trees Ordinance, and Chapter 300 Zoning Ordinance.

2. Native or Naturalized/Non-invasive Vegetation suitable to the soil and hydrologic conditions of the Development Site shall be used unless otherwise specified in applicable state and local codes and regulations, including but not limited to the City Spec Manual and the BMP Manual.
3. Invasive Vegetation may not be included in any planting schedule. (See Invasive Plants in Pennsylvania by the Department of Conservation and Natural Resources (DCNR))
4. The limit of existing, native vegetation to remain shall be delineated on the plan along with proposed construction protection measures.
5. Prior to construction, a tree protection zone shall be delineated in accordance with the City Tree Ordinance, or no less than at the Dripline of the tree canopy. All trees scheduled to remain during construction shall be marked; however, where groups of trees exist, only the trees on the outside edge need to be marked. A barrier, such as a 48 inch high snow fence or 48 inch high construction fence mounted on steel posts located 8 feet on center, shall be placed along the tree protection boundary. No construction, storage of material, temporary parking, pollution of soil, or regrading shall occur within the tree protection zone.
6. All planting shall be performed in conformance with good nursery and landscape practice. Plant materials shall conform to the standards recommended by the American Association of Nurseryman, Inc. in the American Standard of Nursery Stock.
 - a. Planting designs are encouraged to share planting space for optimal root growth whenever possible.
 - b. No staking or wiring of trees shall be allowed without a maintenance note for the stake and/or wire removal within one year of planting.
- K. Areas proposed for infiltration BMPs shall be protected from sedimentation and compaction during the construction phase to maintain maximum infiltration capacity. Staging of earthmoving activities and selection of construction equipment should consider this protection.
- L. Infiltration BMPs shall not be constructed nor receive runoff from disturbed areas until the entire contributory drainage area to the infiltration BMP has achieved final stabilization, unless otherwise authorized by the City.
- M. Where required by the City Engineer or Director, a minimum ten (10) foot wide access easement for inspection and maintenance shall be provided for all stormwater facilities with tributary areas equal or greater than 1000 sq. ft. and not located within a public right-of-way. Easements shall provide for ingress and egress to a public right-of-way.
- N. Drainage easements shall be provided where the conveyance, treatment, or storage of stormwater, either existing or proposed, is identified on the SWM Site Plan. Drainage easements shall be provided to contain and convey the 100-year frequency flood.

- O. The City of Lancaster may require additional stormwater control measures for stormwater discharges to special management areas including but not limited to:
 - 1. Water bodies listed as “impaired” on Pennsylvania’s Clean Water Act 303(d)/305(b) Integrated List.
 - 2. Any water body or watershed with an approved Total Maximum Daily Load (TMDL).
 - 3. Critical areas with sensitive resources (e.g., state designated special protection waters, cold water fisheries, carbonate or other groundwater recharge areas highly vulnerable to contamination, drainage areas to water supply reservoirs, source water protection zones, etc.)
- P. Roof drains and sump pumps shall be tributary to infiltration or vegetative BMPs. Use of catchment facilities for the purpose of reuse is also permitted.
- Q. Non-structural BMPs shall be utilized for all regulated activities unless proven to be impractical by the Director.
- R. All GI and BMPs shall be implemented on the Development Site, or on an abutting site with properly executed easements, as may be required by this Ordinance. However, if the installation of GI and BMPs is proven to be impractical due to existing site constraints, BMPs may be installed off-site, within the same drainage basin as the Development Site, upon the approval by the Director.

Section 260-302. Performance Standards

- A. All regulated activities except those exempted in §260-502 and Very Small Projects as defined in §260-202 shall not increase the post development total runoff volume, or shall permanently remove the first one (1) inch of runoff through infiltration, for all storms equal to or less than the 2-year 24-hour storm event, whichever is greater.
- B. The design of all stormwater management facilities over karst shall include an evaluation of measures to minimize adverse effects, where such evaluation shall be carried out in accordance with §260-405.A of this Ordinance.
- C. Infiltration BMPs shall be designed to the maximum extent practicable to fit the site constraints and limitation, and located to maximize use of natural on-site infiltration features while still meeting the other requirements of this Ordinance. Infiltration BMPs shall include pretreatment BMPs unless shown to be unnecessary.

- D. Infiltration BMPs intended to receive runoff from developed areas shall be selected based on suitability of soils and Development Site conditions and shall be constructed on soils that have the following characteristics:
1. A minimum depth of twenty-four (24) inches between the bottom of the facility and the limiting zone, unless it is demonstrated to the satisfaction of the City of Lancaster that the selected BMP has design criteria which allow for a smaller separation.
 2. A stabilized infiltration rate sufficient to accept the additional stormwater load and drain completely as determined by field tests conducted by the Applicant's professional designer.
 - a. The stabilized infiltration rate is to be determined in the same location and within the same soil horizon as the bottom of the infiltration facility.
 - b. The stabilized infiltration rate is to be determined as specified in the BMP Manual.
- E. The design storm volumes and precipitation intensities to be used in the analysis of peak rates of discharge shall be as required in Section 260-305.
- F. Runoff from impervious areas shall be drained to pervious areas within the Development Site, unless the site has 85% or more impervious cover and is a Redevelopment¹⁰, in which case alternative methods of SW management shall be incorporated including but not limited to GI and on-site detention.
- G. Stormwater runoff from a Development Site to an adjacent property shall flow directly into a natural drainageway, watercourse, or into an existing storm sewer system, or onto adjacent properties in a manner similar to the runoff characteristics of the pre-development flow, unless such pre-development characteristics were inadequate to control adverse impacts such as erosion, flooding, ponding, etc.
- H. Stormwater flows onto adjacent property shall not be created, increased, decreased, relocated, or otherwise altered without written notification of the adjacent property owner(s) by the Applicant. Such stormwater flows shall be subject to the requirements of this Ordinance, including the establishment of a drainage easement. Copies of all such notifications shall be included in SWM Site Plan submissions.
- I. Existing on-site natural SWM facilities shall be used to the maximum extent practicable.
- J. Stormwater runoff shall not be transferred from one sub-watershed to another unless they are sub-watersheds of a common watershed that join together within the perimeter of the Development Site, the effect of the transfer does not alter the peak discharge onto adjacent lands and drainage easements from the affected landowners are provided.

- K. Minimum floor elevations for all structures that would be affected by a basin, other temporary impoundments, or open conveyance systems where ponding may occur shall be two (2) feet above the 100-year water surface elevation. If basement or underground facilities are proposed, detailed calculations addressing the effects of stormwater ponding on the structure and water-proofing and/or flood-proofing design information shall be submitted for approval.
- L. All stormwater conveyance facilities (excluding detention, retention, and wetland basin outfall structures) shall be designed to convey a 25-year storm event*. All stormwater conveyance facilities (excluding detention, retention, and wetland basin outfall structures) conveying water originating from offsite shall be designed to convey a 50-year storm event*. Safe conveyance of the 100-year runoff event* to appropriate peak rate control BMPs must be demonstrated in the design.
 - * A 24 hour SCS Type II storm or an IDF Curve Rational Method storm.
- M. Erosion protection shall be provided along all open channels, and at all points of discharge. Flow velocities from any storm sewer may not result in erosion of the receiving channel.

Section 260-303. Volume Controls

Volume control BMPs are intended to maintain existing hydrologic conditions for small storm events by promoting groundwater recharge and/or evapotranspiration as described in this section. Runoff volume controls shall be implemented using the *Design Storm Method* described in Subsection A below, or through continuous modeling approaches or other means as described in the BMP Manual, or from other applicable sources acceptable to the City. Small Projects may use the method described in Subsection B to design volume control BMPs.

- A. The *Design Storm Method* is applicable to any size of regulated activity that does not meet the definition of Small Project or Very Small Project.
 - 1. The *Design Storm Method* requires detailed modeling based on site conditions that do not increase the post development total runoff volume, and, at a minimum, permanently removes the first one (1) inch of runoff, for all storms equal to or less than the 2-year 24-hour storm event.
 - 2. For modeling purposes:
 - a. Existing (predevelopment) non-forested pervious areas must be considered meadow in good condition in the Hydrologic Soils Group B soils.
 - b. When the existing project site contains impervious area, twenty percent (20%) of existing impervious area to be disturbed shall be considered meadow in good condition in the model for existing conditions, except for repair, reconstruction or restoration of public roadways, or repair, reconstruction or restoration of rail lines, or

construction, repair, reconstruction, or restoration of utility infrastructure when the site will be returned to existing condition, at. At least the first one inch (1") of runoff from new impervious surfaces shall be permanently removed from the runoff flow – i.e. it shall not be released into the surface Waters of the Commonwealth or Combined Sewer System. Removal options include reuse, evaporation, transpiration and infiltration.

- c. The maximum loading ratio for volume control facilities in Karst areas shall be 3:1 impervious drainage area to infiltration area and 5:1 total drainage area to infiltration area. The maximum loading ratio for volume control facilities in non-Karst areas shall be 5:1 impervious drainage area to infiltration area and 8:1 total drainage area to infiltration area. A higher ratio may be approved by the City of Lancaster if justification is provided. Hydraulic depth may be used as an alternative to an area based loading ratio if the design hydraulic depth is shown to be less than the depth that could result from the maximum area loading ratio.
- d. Irrespective of c. above, when existing karst conditions, as determined by the City Engineer, do not allow for the installation of infiltration BMPs, the design volume of stormwater run-off shall be kept out of the combined sewer system and detained on site until the overflow event subsides.

B. Volume Control for Small Projects

- 1. At least the first one inch (1") of runoff from new impervious surfaces or an equivalent volume shall be permanently removed from the runoff flow – i.e. it shall not be released into the surface Waters of the Commonwealth or Combined Sewer System. Removal options include reuse, evaporation, transpiration and infiltration.
- C. If required by the Director, a detailed geologic evaluation of the Development Site shall be performed in areas of carbonate geology to determine the design parameters of recharge facilities. A report shall be prepared in accordance with Section 260-405.A of this Ordinance.
- D. Storage facilities, including normally dry, open top facilities, shall completely drain the volume control storage over a period of time not less than twenty-four (24) hours and not more than seventy-two (72) hours from the end of the design storm. Any designed infiltration at such facilities is exempt from the minimum twenty-four (24) hour standard, i.e. may infiltrate in a shorter period of time, provided that none of this water will be discharged into Waters of the Commonwealth or Combined Sewer System.
- E. Any portion of the volume control storage that meets the following criteria may also be used as rate control storage;
- 1. Volume control storage that depends on infiltration is designed according to the infiltration standards in Section 260-301.

2. The volume control storage which will be used for rate control is that storage which is available within twenty-four (24) hours from the end of the design storm based on the stabilized infiltration rate and/or the evapotranspiration rate.
- F. Volume control storage facilities designed to infiltrate shall avoid the least permeable Hydrologic Soil Group(s) at the Development Site.

Section 260-304. Rate Controls

Rate control for large storms, up to the 100-year event, is essential to protect against immediate downstream erosion and flooding. (See Appendix D for release rate map.)

- A. Match Pre-development Hydrograph. Applicants shall provide infiltration facilities or utilize other techniques which will allow the post-development 100-year hydrograph to match the pre-development 100-year hydrograph, along all parts of the hydrograph, for the Development Site. To match the pre-development hydrograph, the post development peak rate must be less than or equal to the pre-development peak rate, and the post development runoff volume must be less than or equal to the pre-development volume for the same storm event. A shift in hydrograph peak time of up to five minutes and a rate variation of up to five percent (5%) at a given time may be allowable to account for the timing effect of BMPs used to manage the peak rate and runoff volume. "Volume Control" volumes as given in Section 260-302 above may be used as part of this option.
- B. Where the pre-development hydrograph cannot be matched, one of the following shall apply:
1. For areas not covered by a release rate map from an approved Act 167 Plan:
Post development discharge rates shall not exceed the predevelopment discharge rates for the 2, 10, 25, 50, and 100-year 24-hour storm events*. If it is shown that the peak rates of discharge indicated by the post development analysis are less than or equal to the peak rates of discharge indicated by the predevelopment analysis for 2, 10, 25, 50, and 100-year, 24-hour storms*, then the requirements of this section have been met. Otherwise, the applicant shall provide additional controls as necessary to satisfy the peak rate of discharge requirement.
- * A 24-hour SCS type II storm or an IDF Curve Rational Method storm. See Table III-1.
2. Post development rate of runoff from any regulated activity within the Little Conestoga Creek Watershed or Mill Creek Watershed shall not exceed 50% of the peak rates of runoff prior to development for all design storms unless the preexisting hydrograph is not exceeded at all points in time.
 3. For areas covered by a release rate map from an approved Act 167 Plan:
For the 2, 10, 25, 50, and 100-year storm events*, the post development *peak discharge rates will follow the applicable approved release rate maps.*

*A 24 hour SCS type II storm or an IDF Curve Rational Method storm. See Table III-1

- C. Normally dry, open top, storage facilities shall completely drain the rate control storage over a period of time less than or equal to 24 hours from the peak 100 year water surface design elevation.
- D. A variety of BMPs should be employed and tailored to suit the Development Site. Non-structural BMPs and green infrastructure are preferred. The following is a partial listing of BMPs which can be utilized in SWM systems for rate control where appropriate:
 - 1. Decreased impervious surface coverage
 - 2. Routed flow over grass
 - 3. Grassed channels and vegetated strips.
 - 4. Bio-retention areas (rain gardens)
 - 5. Concrete lattice block or permeable surfaces
 - 6. Seepage pits, seepage trenches or other infiltration structures
 - 7. Rooftop detention
 - 8. Parking lot detention
 - 9. Cisterns and underground reservoirs
 - 10. Amended soils
 - 11. Retention basins
 - 12. Infiltration basins
 - 13. Green (vegetated) roofs
 - 14. Other methods as may be found in the BMP Manual.
- E. Small Projects are not required to provide for Rate Control.

Section 260-305. Calculation Methodology

- A. Any stormwater runoff calculations involving drainage areas greater than two hundred (200) acres and Time of Concentration (Tc) greater than sixty (60) minutes, including on- and off-site areas, shall use generally accepted calculation techniques based on the NRCS soil-cover complex method.
- B. Stormwater runoff from all Development Sites shall be calculated using either the modified rational method, a soil-cover-complex methodology, or other method acceptable to the City of

Lancaster. Table III-1 summarizes acceptable computation methods. It is assumed that all methods will be selected by the design professional based on the individual limitations and suitability of each method for a particular Development Site.

TABLE III-1 ACCEPTABLE COMPUTATION METHODOLOGIES FOR STORMWATER MANAGEMENT PLANS		
METHOD	METHOD DEVELOPED BY	APPLICABILITY
TR-20 (or commercial computer package based on TR-20)	USDA NRCS	Applicable where use of full hydrology computer model is desirable or necessary.
WinTR-55 (or commercial computer package based on TR-55)	USDA NRCS	Applicable for land development plans within limitations described in TR-55.
HEC-1 / HEC-HMS	US Army Corps of Engineers	Applicable where use of full hydrologic computer model is desirable or necessary.
Rational Method (or commercial computer package based on Rational Method)	Emil Kuichling (1889)	For development sites less than 200 acres, $T_c < 60$ min. or as approved by the City of Lancaster.
EFH2	USDA NRCS	Applicable in rural and undeveloped areas subject to the Program Limits.
Other Methods	Varies	Other methodologies approved by the City of Lancaster.

- C. If the SCS method is used, Antecedent Moisture Condition 1 is to be used in areas of carbonate geology, and Antecedent Moisture Condition 2 is to be used in all other areas. A type II distribution shall be used in all areas.
- D. If the Rational Method is used, the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 data (see item "B" above) or PennDOT Publication 584 "PennDOT Drainage Manual," 2008 Edition, or latest, shall be used to determine the rainfall intensity in inches per hour based on the information for the 5- through 60-minute duration storm events.
- E. Hydrographs may be obtained from NRCS methods such as TR-55, TR20, or from use of the "modified" or "unit hydrograph" rational methods. If "modified" or "unit hydrograph" rational methods are used, the ascending leg of the hydrograph shall have a length equal to three (3) times the time of concentration ($3 \times T_c$) and the descending leg shall have a length equal to seven (7) times the time of concentration ($7 \times T_c$) to approximate an SCS type II hydrograph.¹¹
- F. Runoff calculations shall include a hydrologic and hydraulic analysis indicating volume and velocities of flow and the grades, sizes, and capacities of water carrying structures, sediment basins, retention and detention structures and sufficient design information to construct such

facilities. Runoff calculations shall also indicate both pre-development and post-development rates for peak discharge of stormwater runoff from all discharge points.

- G. For the purpose of calculating pre-development peak discharges, all runoff coefficients, both on-site and off-site, shall be based on actual land use assuming summer or good land conditions. Post-development runoff coefficients for off-site discharges used to design conveyance facilities shall be based on actual land use assuming winter or poor land conditions.
- H. Criteria and assumptions to be used in the determination of stormwater runoff and design of management facilities are as follows:
 - 1. Runoff coefficients shall be based on the information contained in Appendix B-1 and B-2 if the actual land use is listed in those Appendices. If the actual land use is not listed in these Appendices, runoff coefficients shall be chosen from other published documentation, and a copy of said documentation shall be submitted with the SWM Site Plan.
 - 2. A sample worksheet for calculating T_c is provided in Appendix B-4. Times of concentration (T_c) shall be based on the following design parameters:
 - a. Sheet flow: The maximum length for each reach of sheet or overland flow before shallow concentrated or open channel flow develops is one hundred fifty (150) feet. Flow lengths greater than one hundred (100) feet shall be justified based on the actual conditions at each Development Site. Sheet flow may be determined using the nomograph in Appendix B-3, or the Manning's kinematic solution shown in the Sheet Flow section of Worksheet No. 1 in Appendix B-4.
 - b. Shallow concentrated flow: Travel time for shallow concentrated flow shall be determined using Figure 3-1 from TR-55, Urban Hydrology for small watersheds, as shown in Appendix B-5.
 - c. Open Channel flows: At points where sheet and shallow concentrated flows concentrate in field depressions, swales, gutters, curbs, or pipe collection systems, the travel times to downstream end of the Development Site between these design points shall be based upon Manning's Equation and/or acceptable engineering design standards as determined by the Municipal Engineer.
 - 3. The Applicant may use stormwater credits for Non-Structural BMPs in accordance with the BMP Manual. The allowable reduction will be determined by the City of Lancaster.
 - 4. Peak rate control is not required for off-site runoff. Off-site runoff may be by-passed around the site provided all other discharge requirements are met. If offsite runoff is routed through rate control facilities, runoff coefficients for off-site discharges used to design those rate control facilities shall be based on actual land use assuming winter or poor land conditions.

- I. Times of Concentration (Tc) shall be calculated based on the methodology recommended in the respective model used, except that Tc for channel and pipe flow shall be computed using Manning's equation. Supporting documentation and calculations must be submitted for review and approval

Section 260-306. Riparian Corridors

- A. In order to protect and improve water quality, a Riparian Corridor Easement shall be created and recorded as part of any subdivision or land development that encompasses a Riparian Corridor.
- B. As required by Pa. Code Chapter 102, the Riparian Corridor Easement shall be measured to the limit of the 100-year floodplain.
- C. Minimum Management Requirements for Riparian Corridors.
 1. Existing native vegetation shall be protected and maintained within the Riparian Corridor Easement.
 2. Whenever practicable invasive vegetation shall be actively removed and the Riparian Corridor Easement shall be planted with native trees, shrubs and other vegetation to create a diverse native plant community appropriate to the intended ecological context of the site.
- D. The Riparian Corridor Easement shall be enforceable by the City of Lancaster and shall be recorded in the Lancaster County Recorder of Deeds Office, so that it shall run with the land and shall limit the use of the property located therein. The easement shall allow for the continued private ownership and shall count toward the minimum lot area as required by Zoning, unless otherwise specified in the City Zoning Ordinance.
- E. Any permitted use within the Riparian Corridor Easement shall be conducted in a manner that will maintain the extent of the existing one-hundred-year floodplain, improve or maintain the stream stability, and preserve and protect the ecological function of the floodplain, and shall be in accordance with the provisions of all applicable City codes and ordinances including but not limited to Chapter 109 Building Construction and Floodplain Management and Chapter 300 Zoning.
- F. The following conditions shall apply when public and/or private recreation trails are permitted within Riparian Corridors:
 1. Trails shall be for non-motorized use only.

2. Trails shall be designed to have the least impact on native plant species and other sensitive environmental features.
- G. Septic drainfields and sewage disposal systems shall not be permitted within the Riparian Corridor Easement and shall maintain a minimum distance of one hundred (100) feet from the top of streambank. This provision shall not relieve any person from complying with all other City Ordinances governing sewers, sewer systems and sewage disposal.

**ARTICLE IV
INFORMATION TO BE INCLUDED ON OR WITH STORMWATER MANAGEMENT SITE
PLANS**

Section 260-401. General Plan Requirements

- A. The SWM Site Plan shall consist of a narrative and all applicable calculations, maps, plans and supplemental information necessary to demonstrate compliance with this Ordinance.
- B. All landowners of land, or their authorized agent, included in the SWM Site Plan shall be required to execute all applications and final documents.
- C. All SWM Site Plans shall be prepared by a Qualified Person.
- D. Where the regulated activity constitutes subdivision or land development as hereinabove defined, the SWM Site Plan shall be submitted with and form an integral part of the plans required under the City Subdivision and Land Development Ordinance (SALDO), and the plan procedure and requirements of Chapter 265 in the City Code shall apply.

Section 260-402. Site Plan Drafting Standards

- A. The Plan should be clearly and legibly drawn at a scale of 1" = 50' or larger (i.e. 1" = 40', 1" = 30', etc.) and shall be submitted on 24-inch x 36-inch sheets.
- B. If the Plan is prepared in two (2) or more drawing sheets, a key map showing the location of the sheets and a match line shall be placed on each sheet.
- C. Each sheet shall be numbered to show the relationship to the total number of sheets in the Plan (e.g. Sheet 1 of 5).
- D. A space four and one quarter (4 ¼) inches by one and three quarter (1 ¾) inches shall be provided for the recording certificate for the Office of the Recorder of Deeds of Lancaster County.

Section 260-403. Site Plan Information

The following items shall be included in the SWM Site Plan:

- A. Location and Identification

1. The date of the SWM Site Plan and latest revision, graphic scale, written scale and North arrow.
2. The name of the development, the name and address of the owner of the property, and the name of the individual or firm preparing the Plan.
3. The file or project number assigned by the firm that prepared the Plan.
4. Source of title including deed book volume and page number for the subject property.
5. Parcel ID Number (PIN).
6. Names of all adjoining property owners with PIN and deed book information.
7. A legible location map, drawn to a scale of a minimum of one inch equals two thousand feet (1" = 2,000'), relating the Plan to municipal boundaries, at least two (2) intersections of road centerline or other identifiable landmarks.
8. The total tract boundary with distances marked to the nearest hundredth of a foot and bearings to the nearest degree.
9. Total tract size in acres and square feet to the nearest hundredth of a foot.
10. Drainage area to each BMP in square feet and acres.

B. Existing Features

1. In areas of disturbance, contours at intervals of one (1) or two (2) feet. In areas of steep slopes (greater than 15 percent) and areas undisturbed, five-foot contour intervals may be used.
2. The locations of all existing utilities (including on lot disposal systems and wells) and stormwater management facilities, sanitary sewers, and water lines and associated easements.
3. Physical features including flood hazard boundaries, wetlands, sinkholes, streams, lakes, ponds and other waterbodies, existing drainage courses, karst features, areas of native vegetation including trees greater than 6" diameter at breast height, woodlands, other environmentally sensitive areas and the total extent of the upstream area draining through the Development Site.
4. An overlay showing soil names, boundaries and hydrologic soil groups.
5. All existing man-made features within fifty (50) feet of the Development Site boundary, or as determined by the City Engineer.
6. Municipal, Zoning District, Historic District, Streetscape District and other applicable boundaries lines.

C. Proposed Features

1. Changes to the land surface and vegetative cover, including final proposed contours at intervals of one (1) or two (2) feet in areas of disturbance. In areas of steep slopes (greater than 15 percent) and areas undisturbed, five-foot contour intervals may be used.
2. Proposed structures, roads, paved areas, buildings and other impervious and semi-impervious areas.
3. The location of any proposed on-lot disposal systems, replacement drainfield easements, and water supply wells, utilities and stormwater management facilities.
4. Area of each BMP proposed in square feet and acres.
5. Plan and profile drawings of all proposed SWM facilities, including structural and non-structural BMPs, drainage structures, pipes, open channels, and swales.
6. Where pervious pavement is to be installed, pavement material and construction specifications shall be included.
7. The location of all existing and proposed easements, including drainage easements, access easements and riparian corridor easements.
8. A planting plan shall be provided for all vegetated BMPs in accordance with Section 260-301.J.
9. The location of all E&S control facilities.

D. Notes and Certificates

1. A statement, signed by the landowner, acknowledging the SWM Facilities to be permanent fixtures that cannot be altered or removed unless a revised Plan is approved by the City of Lancaster.
2. The following signature block for the City of Lancaster:

The City of Lancaster SWM Site Plan Approval Certification

On this date _____, 20____, the City of Lancaster approved this project, and all conditions have been met. This approval includes the complete set of plans and information that are filed with the City of Lancaster in File No. _____, based upon its conformity with the standards of the City of Lancaster Stormwater Management Ordinance.

City Engineer

3. For SWM facilities located off-site,
 - a. A note on the Plan referencing a recorded Stormwater Operation and Maintenance (O&M) Agreement that indicates the location and responsibility for maintenance of the off-site facilities.
 - b. All off-site SWM Facilities shall meet the performance standards specified in this Ordinance.
 - c. Copies of all easement agreements.
4. A note informing the owner that the City of Lancaster shall have the right of entry for the purposes of inspecting all stormwater conveyance, treatment, or storage facilities.
5. A note indicating existing and proposed land use(s).
6. A note and/or table showing the annual estimated stormwater capture in gallons, the design storm depth for annual capture and the loading ratio for each BMP employed. The note and/or table shall include the type of BMP, size of BMP in square feet and the drainage area for each BMP in square feet and acres.

Section 260-404. Additional Information

- A. General description of the Development Site, including a description of existing natural and hydrologic features and any environmentally sensitive areas.
- B. General description of the overall SWM concept for the project, including a description of permanent SWM techniques, non-structural BMPs to be employed and construction specifications of the materials to be used for structural SWM facilities. The narrative shall include a description of any treatment trains and how the facilities are meant to function with each other to manage stormwater runoff.
- C. The effect of the project (in terms of runoff volumes, water quality and peak flows) on adjacent properties and on any existing municipal stormwater management facilities that may receive runoff from the Development Site.
- D. Complete hydrologic, hydraulic, and structural computations for all SWM facilities.
- E. Expected project time schedule.
- F. Such other information as may be requested from time to time by the City Engineer.

Section 405. Supplemental Information

- A. If required by the City Engineer, in areas of carbonate geology, a detailed geologic evaluation, or such other evaluation as approved by the City Engineer, prepared by a registered Professional Geologist (PG) must be submitted as part of the SWM Site Plan. The report shall include, but not limited to the following:
1. The location of the following karst features;
 - a. sinkholes
 - b. closed depressions
 - c. lineaments in carbonate areas
 - d. fracture traces
 - e. caverns
 - f. intermittent lakes
 - g. ephemeral disappearing streams
 - h. bedrock pinnacles (surface or subsurface)
 2. A plan for remediation of any identified karst features.
 3. Impacts of stormwater management facilities on adjacent karst features, and impacts of karst features on adjacent stormwater management facilities.
- B. An E&S Plan, including all approvals, as required by 25 Pa. Code Chapter 102, shall be provided to the City of Lancaster prior to final plan approval.
1. No Regulated Activities within the City of Lancaster shall commence until an Erosion and Sediment Control Plan for construction activities has been approved by the City.
- C. For any activities that require a DEP Joint Permit Application and are regulated under 25 Pa. Code Chapter 105 or 25 Pa. Code Chapter 106, require a Penn DOT Highway Occupancy Permit, or require any other permit under applicable state or federal regulations, the permit(s) shall be part of the SWM Site Plan and must be obtained prior to final plan approval.
- D. An Operation and Maintenance (O&M) Plan that addresses the requirements of Section 260-603.

**ARTICLE V
PLAN PROCESSING PROCEDURES**

Section 260-501. Small Projects.

- A. Anyone proposing a Small Project, as defined in §260-202, shall submit 4 copies of the Small Project Application to the City of Lancaster.
- B. A complete Small Project Application shall include:
1. Small Project Application Form.
 2. Small Project Sketch Plan including the following:
 - a. Name and address of landowner (and/or) Applicant
 - b. Date of Small Project Application submission.
 - c. Name of individual and/or firm that prepared the sketch if different than the landowner and/or Applicant
 - d. Total lot area in square feet.
 - e. Location and square footage of existing impervious area (buildings, patios, sidewalks, etc.)
 - f. Location and square footage of proposed impervious area or land disturbance
 - g. Approximate footprint and location of all structures on adjacent properties if located within 50 feet of the proposed impervious area or land disturbance
 - h. Approximate location of existing stormwater management facilities, if present
 - i. Location and description of proposed stormwater management facilities
 - j. Direction of proposed stormwater discharge (e.g. with arrows)
 - k. Scale and north arrow
 - l. Such other information as requested by the City Engineer
 - m. Plan may be on 8 ½" x 11" sheets
 - n. Plan shall show any drainage swale or water course.
 3. Project description. As required in 2.g above, the description of proposed and existing SWM facilities shall include the BMP type and size (LxWxD); estimated annual capture and Design Storm depth; and drainage area for all BMPs. All dimensions shall be in inches, feet and square feet, as applicable.
 4. Filing fee (in accordance with the City of Lancaster's current fee schedule).

C. The Small Project Application shall be submitted on the form provided.

Section 260-502. Exemption from Plan Submission Requirements

A. The following regulated activities are specifically exempt from the SWM Site Plan requirements stipulated in Section 260-301.A and Articles IV and V of this Ordinance. However, the submission of a SWM Permit application shall be required for all regulated and exempt activities.

1. Agricultural activity (see definitions) provided the activities are performed according to the requirements of 25 Pa. Code Chapter 102.
2. Forest management and timber operations (see definitions) provided the activities are performed according to the requirements of 25 Pa. Code Chapter 102.
3. Conservation Practices being installed as part of the implementation of a Conservation Plan written by an NRCS certified planner.
4. Repair, reconstruction or restoration of public roadways, or repair, reconstruction or restoration of rail lines, or construction, repair, reconstruction, or restoration of utility infrastructure when the site will be returned to existing condition.
5. Very Small Projects as defined herein, such as fence posts; mail box posts, tombstones; doghouses/runs; pads for trash receptacles, outdoor grills; lawn ornaments and other non-vegetative landscape elements with an aggregate area of less than 100 square feet.
6. Gardens and vegetative landscaping that do not increase impervious coverage and meet the following criteria:
 - a. Located on slopes less than eight percent (8%).
 - b. Not within 150 feet of any permanent watercourse.
 - c. Less than 1,000 square feet in aggregate area.
 - d. Hardscaped areas within gardens and vegetated landscape areas such as patios, walls, paved walkways and pools or ponds, shall be considered impervious areas and are not exempt if the total hardscaped area exceeds 100 square feet.

B. The City of Lancaster may deny or revoke any exemption pursuant to this Section at any time for any project that the City of Lancaster believes may pose a threat to public health, safety, property or the environment.

Section 260-503. Pre-Application Meeting

Applicants are encouraged to schedule a pre-application meeting to review the overall stormwater management concept with City staff and Engineer. The pre-application meeting is not mandatory and shall not constitute formal filing of a plan with the City of Lancaster. Topics discussed may include the following:

- Available geological maps, plans and other available data.
- Findings of the site analysis including identification of any environmentally sensitive areas, wellhead protection areas, riparian corridors, hydrologic soil groups, existing natural drainageways, karst features, areas conducive to infiltration to be utilized for volume control, etc.
- Results of infiltration tests.
- Applicable City Subdivision and Land Development and/or Zoning Ordinance provisions.
- The conceptual project layout, including proposed structural and non-structural BMPs.

Section 260-504. Stormwater Management Site Plan Submission

- A. When a Stormwater Management Site Plan is required, the applicant shall submit the following to the City of Lancaster:
 1. Four (4) copies of the SWM Permit Application and four (4) copies of the Site Plan prepared in accordance with the requirements of Article IV of this Ordinance.
 2. Three (3) copies of all supplemental data.
 3. Plans shall also be submitted in an electronic Auto CAD format.
 4. A filing fee (in accordance with the City of Lancaster's current fee schedule).
- B. The SWM Site Plan shall be submitted in a format that is clear, concise, legible, neat and well organized.
- C. The applicant is responsible for submitting plans to any other agencies such as the Lancaster County Conservation District, PennDOT, DEP, etc. when permits from these agencies are required. Final approval shall be conditioned upon the applicant obtaining all necessary permits.

- D. Incomplete submissions as determined by the Planning Commission or per City staff shall be returned to the Applicant within thirty (30) business days unless a land development approval is required, along with a statement that the submission is incomplete, and stating the deficiencies found. Otherwise, the application shall be deemed accepted for filing as of the date of submission. Acceptance of the application shall not, however, constitute an approval of the plan or a waiver of any deficiencies or irregularities. The applicant may appeal the City of Lancaster's decision not to accept a particular application in accordance with Section 260-904 of this Ordinance.
- E. At its sole discretion and in accordance with this Article, when a SWM Site Plan is found to be deficient, the City of Lancaster may either disapprove the submission and require a resubmission, or in the case of minor deficiencies, the City of Lancaster may accept submission of revisions.

Section 260-505. City Review and Approval

- A. When the regulated activity constitutes a Subdivision or Land Development as defined in the City's Subdivision and Land Development Ordinance, the SWM Site Plan and Subdivision/Land Development Plan shall be processed concurrently according to the plan processing procedure outlined in Chapter 265 of the City Code.
- B. When the regulated activity constitutes a Small Project the City of Lancaster Stormwater Bureau Manager shall review and take action on the Small Project Application within thirty (30) business days of filing.
- C. When the regulated activity does not constitute a Subdivision or Land Development or Small Project the City Engineer or Stormwater Bureau Manager shall review the SWM Site Plan for conformance with the provisions of this Ordinance within thirty (30) business days of filing.
- D. If the City disapproves the SWM Site Plan, the City will state the reasons for the disapproval in writing. The City also may approve the SWM Site Plan with conditions and, if so, shall provide the acceptable conditions for approval in writing. Such conditional approval shall be contingent upon the applicant's written acceptance of the conditions.

Section 260-506. Revision of Plans

- A. Revisions to a SWM Site Plan after submission but before action by the City shall require a re-submission of the modified SWM Site Plan consistent with Section 260-504 of this Ordinance and be subject to review as specified in Section 260-505 of this Ordinance.

- B. For the purposes of review deadlines, each resubmission required under Section 260-506.A (after submission but before approval) shall constitute a new submission for the purposes of time limits as set forth in the MPC and this Ordinance.
- C. Any substantial revisions to a SWM Site Plan after approval shall be submitted as a new plan to the City of Lancaster, accompanied by the applicable Review Fee.

Section 260-507. Authorization to Construct and Term of Validity

Approval of a SWM Site Plan shall be valid for a period not to exceed five (5) years. This time period shall commence on the date that the City of Lancaster approves the SWM Site Plan. If a Certificate of Completion as required by Section 260-508 of this Ordinance has not been submitted within the specified time period, then the City of Lancaster may consider the SWM Site Plan disapproved and may revoke any and all permits issued by the City of Lancaster. SWM Site Plans that are considered disapproved by the City of Lancaster may be resubmitted in accordance with Section 260-504 of this Ordinance.

Section 260-508. Certificate of Completion

- A. At the completion of the project, and as prerequisite for the release of the financial security, the applicant shall provide Certification of Completion from an Engineer, Landscape Architect, Surveyor or other qualified person verifying that all permanent SWM facilities have been constructed according to the Plans and Specifications and approved revisions thereto.
- B. Upon receipt of the Certificate of Completion, and prior to release of the remaining financial security the City of Lancaster shall conduct a final inspection to certify compliance with this Ordinance. The type of acceptable financial security should include a cash or escrow deposit in addition to a bond or letter of credit.

Section 260-509. Plan Recordation

- A. Upon completion of the plan improvements the applicant shall submit an As-Built Plan for recordation in the Office of the Recorder of Deeds. The As-Built Plan must show the final design specifications for all stormwater management facilities and be sealed by a registered professional engineer. When a digital submission of an As-Built Plan is required, all coordinates as depicted on the plan shall be based on the PA South Zone State Plane Coordinate System (NAD83 for horizontal and NAVD88 for vertical).
- B. Concurrently with the recordation of the As-Built Plan, the applicant shall submit the SWM Site Plan for recordation in the Office of the Recorder of Deeds, unless the Site Plan has already been recorded.

**ARTICLE VI
OPERATION AND MAINTENANCE (O&M)**

Section 260-601. Responsibilities of Applicants and Landowners

- A. The Landowner, successor and assigns shall maintain all Stormwater Management Facilities in good working order in accordance with the approved O & M Plan.
- B. The Landowner shall convey to the City of Lancaster easements to assure access for inspections and maintenance, if required.
- C. The Landowner shall keep on file with the City of Lancaster the name, address and telephone number of the person or company responsible for maintenance activities; in the event of a change, new information will be submitted to the City of Lancaster within ten (10) days of the change.
- D. Enumerate permanent SWM facilities as permanent real estate appurtenances and record as deed restrictions or easements that run with the land.
- E. The record owner of the Development Site shall sign and record an Operation and Maintenance (O&M) Agreement covering all on-site and off-site Stormwater Management Facilities, including riparian buffers and riparian forest buffers, which are to be privately owned. Said agreement, designated as Appendix C, is attached and made part hereto. The O&M Plan and Agreement shall be recorded as a restrictive covenant agreement that runs with the land.

Section 260-602. Operation and Maintenance Agreements

The Operation and Maintenance Agreement, as provided in Appendix C, may be subject to the review and approval of the City Solicitor and City.

Section 260-603. Operation and Maintenance (O&M) Plan Contents

- A. The O&M Plan shall clearly establish the operation and maintenance necessary to ensure the proper functioning of all temporary and permanent stormwater management facilities and erosion and sedimentation control facilities.
- B. The following shall be addressed in the O&M Plan:
 - 1. Description of maintenance requirements, including, but not limited to, the following:

- a. Regular inspection of the SWM facilities. To assure proper implementation of BMPs, maintenance and care SWM BMPs should be inspected by a qualified person, which may include the landowner, or the owner's designee (including the City of Lancaster for dedicated and owned facilities), according to the following minimum frequencies:
 - i. Annually for the first five (5) years.
 - ii. Once every three (3) years thereafter.
 - iii. During or immediately after the cessation of a 10-year or greater storm.
 - iv. As specified in the O&M Agreement pursuant to Section 260-602. In the instance that the O&M Agreement and the schedule set forth in i., ii. and iii. above are inconsistent, the O&M Agreement shall control.
 - b. All conveyance and detention facilities shall be kept free of any debris or other obstruction and in original design condition.
 - c. Removal of silt from all permanent structures which trap silt or sediment in order to keep the material from building up in grass waterways, pipes, detention or retention basins, infiltration structures, or BMPs, and thus reducing their capacity to convey or store water.
 - d. Re-establishment of vegetation of scoured areas or areas where vegetation has not been successfully established. Selection of seed mixtures shall be subject to approval by the City of Lancaster.
2. Riparian forest buffer management plan prepared in accordance with 25 Pa. Code Chapter 102 §14(b)(4), if required.
 3. Identification of a responsible individual, corporation, association or other entity for ownership and maintenance of both temporary and permanent stormwater management and erosion and sedimentation control facilities.
 4. Establishment of suitable easements for access to all facilities.

Section 260-604. Maintenance of Facilities Accepted by the City of Lancaster

- A. The City of Lancaster reserves the right to accept or reject any proposal to dedicate ownership and operating responsibility of any SWM facilities to the City of Lancaster.
- B. If SWM facilities are accepted by the City of Lancaster for dedication, the Landowner/Applicant shall be required to pay a specified amount to the Stormwater Management Fund to defray costs of periodic inspections and maintenance expenses. This fee shall be provided to the City of Lancaster prior to unconditional plan approval. The

amount of the deposit shall be determined as follows subject to the approval of the City governing body:

1. The deposit shall cover the estimated costs for maintenance and inspections for twenty-five (25) years. The City of Lancaster will establish the estimated costs according to the O&M requirements outlined in the approved O&M Plan.
 2. The amount of the deposit to the fund shall be converted to present worth of the annual series values.
 3. If a storage facility is proposed that also serves as a recreation facility (e.g. ballfield, lake), the City of Lancaster may reduce or waive the amount of the maintenance fund deposit based upon the value of the land for public recreation purpose.
- C. If at any time a dedicated storage facility is eliminated due to the installation of storm sewers or other storage facility such as a regional detention facility, the unused portion of the maintenance fund deposit will be applied to the cost of abandoning the facility and connecting to the storm sewer system or other facility. Any amount of the deposit remaining after the costs of abandonment are paid will be returned to the depositor.
- D. All dedicated facilities shall be inspected by the City of Lancaster according to the following minimum frequencies:
1. Annually for the first five (5) years.
 2. Once every three (3) years thereafter.
 3. During or immediately after the cessation of a 10-year or greater storm.
 4. As specified in the O&M Agreement pursuant to Section 260-602. In the instance that the O&M Agreement and the schedule set forth in 1, 2 and 3 above are inconsistent, the O&M Agreement shall control.
- E. Maintenance shall be conducted as necessary to provide for the continued functioning of the facility. Costs of inspections and repairs are recoverable from the Stormwater Management Fund.

Section 260-605. Maintenance of Existing Facilities / BMPs

SWM facilities existing on the effective date of this Ordinance, which have not been accepted by the City of Lancaster or for which maintenance responsibility has not been assumed by a private entity such as a homeowners' association shall be maintained by the individual Landowners. Such maintenance shall include at a minimum those items set forth in Section 260-603.B.1

above. If the City of Lancaster determines at any time that any permanent SWM facility has been eliminated, altered, blocked through the erection of structures or the deposit of materials, or improperly maintained, the condition constitutes a nuisance and the City of Lancaster shall notify the Landowner of corrective measures that are required, and provide for a reasonable period of time, not to exceed 30 days, within which the property owner shall take such corrective action. If the Landowner does not take the required corrective action, the City of Lancaster may either perform the work or contract for the performance of the work and bill the Landowner for the cost of the work plus a penalty of 10% of the cost of the work. If such bill is not paid by the property owner within 30 days, the City of Lancaster may file a municipal claim against the property upon which the work was performed in accordance with the applicable laws. The City of Lancaster shall have the right to choose among the remedies and may use one or more remedies concurrently.

**ARTICLE VII
FEES AND EXPENSES**

Section 260-701. General

The City of Lancaster may include all costs incurred in the review fee charged to an applicant.

Section 260-702. Expenses Covered by Fees

The review fee may include, but not be limited to, costs for the following:

- A. Administrative and clerical costs.
- B. Review of the SWM Site Plan.
- C. Review of the Stormwater Operation and Maintenance Plan and Agreement by the City Solicitor/Staff.
- D. Inspections.
- E. Any additional work required to enforce any permit provisions regulated by this Ordinance, correct violations, and assure proper completion of stipulated remedial actions.

**ARTICLE VIII
PROHIBITIONS**

Section 260-801. Prohibited Discharges and Connections

- A. The following connections are prohibited, except as provided in Section 260-801.D below:
1. Any drain or conveyance, whether on the surface or subsurface, that allows any non-stormwater discharge including sewage, process wastewater, and wash water to enter a municipal separate storm sewer (if applicable), or Waters of the Commonwealth, and any connections to the storm sewer from indoor drains and sinks; and
 2. Any drain or conveyance connected from a commercial or industrial land use to the municipal separate storm sewer (if applicable) which has not been documented in plans, maps, or equivalent records, and approved by the City of Lancaster.
 3. Any connection of an MS4 or other separate storm sewer facility or appertunences, to the City's Combined Sewer System.
- B. No person shall allow, or cause to allow, discharges into surface Waters of the Commonwealth which are not composed entirely of stormwater, except (1) as provided in Section 260-801.D below and (2) discharges allowed under a state or federal permit.
- C. No person shall place any structure, fill, landscaping or vegetation into a SWM facility or within a drainage easement that will limit or diminish the functioning of the facility in any manner.
- D. The following discharges are authorized unless they are determined to be significant contributors to pollution to the Waters of the Commonwealth:
1. Discharges from firefighting activities
 2. Potable water sources including water line flushing
 3. Irrigation drainage
 4. Air conditioning condensate
 5. Springs
 6. Water from crawl space pumps
 7. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spill material has been removed) and where detergents are not used
 8. Flows from riparian habitats and wetlands
 9. Uncontaminated water from foundations or from footing drains

10. Lawn watering
11. De-chlorinated swimming pool discharges
12. Uncontaminated groundwater
13. Water from individual residential car washing
14. Routine external building wash down (which does not use detergents or other compounds)
15. Diverted stream flows
16. Rising ground waters

E. In the event that the City of Lancaster or DEP determines that any of the discharges identified in Section 260-801.D above significantly contribute to pollution of the Waters of the Commonwealth, the City of Lancaster or DEP will notify the responsible person(s) to cease the discharge.

Section 260-802. Alteration of SWM BMPs

No person shall modify, remove, fill, landscape, or alter any SWM BMPs, facilities, areas, or structures without the written approval of the City of Lancaster.

**ARTICLE IX
ENFORCEMENT AND PENALTIES**

Section 260-901. Right-of-Entry

Upon presentation of proper credentials, duly authorized representatives of the City of Lancaster may enter at reasonable times upon any property within the City of Lancaster to investigate or ascertain the condition of the subject property in regard to any aspect regulated by this Ordinance.

Section 260-902. Enforcement

The City is hereby authorized and directed to enforce all of the provisions of this Ordinance.

- A. Any permit or approval issued by the City of Lancaster pursuant to this Ordinance may be suspended by the City of Lancaster for:
 - 1. Noncompliance with or failure to implement any provision of the approved SWM Site Plan or O&M Agreement.
 - 2. A violation of any provisions of this Ordinance or any other applicable law, Ordinance, rule, or regulation relating to the regulated activity.
 - 3. The creation of any condition or the commission of any act during construction or development that constitutes or creates a hazard, nuisance, pollution or endangers the life or property of others.

- B. A suspended permit may be reinstated by the City when:
 - 1. The City has inspected and approved the corrections to the violation that caused the suspension; and
 - 2. The City is satisfied that the violation has been corrected.

Section 260-903. Penalties

- A. Any person who or which has violated any provisions of this Ordinance, shall, upon a judicial determination thereof, be subject to civil judgment for each such violation of not less than five hundred and 00/100 dollars (\$500), or more than one thousand and 00/100 dollars (\$1000), for each violation, recoverable with all court costs including reasonable attorney's fees incurred by the City as a result thereof. Each day that a violation occurs shall constitute a separate offense unless the Judge determining that there has been a violation

further determines that there was a good faith basis for the person, partnership, corporation or limited liability company violating the Chapter to have believed that there was no such violation, in which event there shall be deemed to have been only one such violation until the fifth day following the date of the judicial determination of a violation and thereafter each day that a violation continues shall constitute a separate violation. All fines shall be paid to City of Lancaster.

- B. In addition, the City of Lancaster may institute injunctive, mandamus or any other appropriate action or proceeding at law or in equity for the enforcement of this Ordinance, and may request 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.

Section 260-904. Appeals

- A. Any person aggrieved by any administrative action of the City of Lancaster may appeal to the City of Lancaster Stormwater Board of Appeals within thirty (30) days of that action. Any such appeal shall be governed by the procedures of Article V of the Local Agency Law, 2 Pa. C.S.A. 401 et seq.
- B. Any person aggrieved by any decision of the City of Lancaster Stormwater Board of Appeals, may appeal to the Lancaster County Court of Common Pleas, in accordance with Article VII of Local Agency Law, 2 Pa. C.S.A. 701 et seq. the Local Agency Law, within 30 days of that decision.

Section 260-905. Modification of Ordinance Provisions

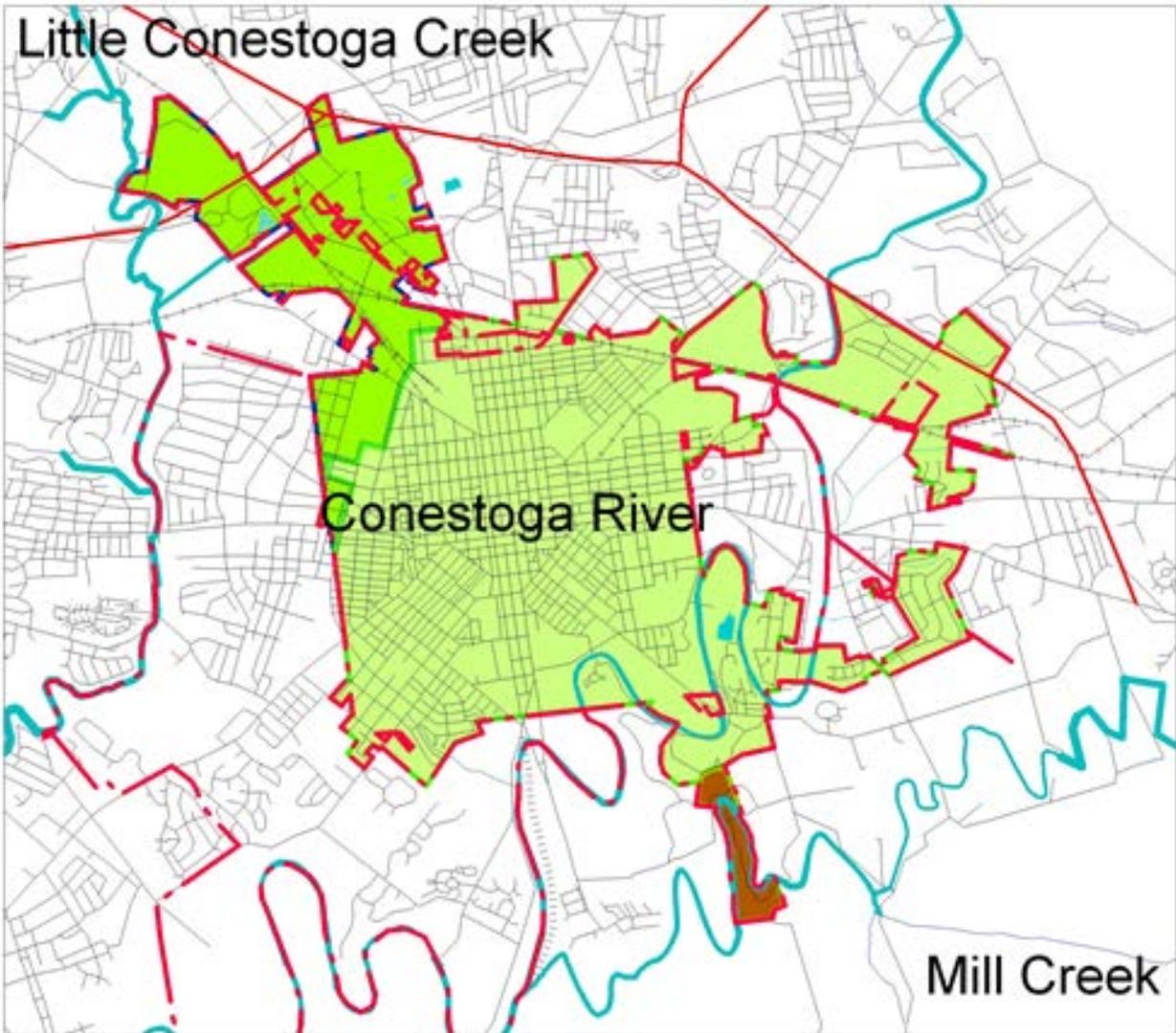
- A. The provisions of this Ordinance not relating to water quality are intended as minimum standards for the protection of the public health, safety, and welfare. The City of Lancaster reserves the right to modify or to extend them conditionally in individual cases as may be necessary in the public interest; provided, however, that such variation shall not have the effect of nullifying the intent and purpose of this Ordinance, and that the applicant shows that to the satisfaction of the City that the applicable regulation is unreasonable, or will cause undue hardship, or that an alternative proposal will allow for equal or better results. The list of such modifications, along with an explanation of and justification for each modification, shall be included on the plan. This section does not apply during an enforcement action.
- B. In granting waivers/modifications for provisions of this Ordinance not relating to water quality, the City may impose such conditions as will, in its judgment, secure substantially the objectives of the standards and requirements of this Ordinance.

C. Notwithstanding the foregoing, the Director of Public Works may from time to time promulgate rules and regulations and/or policies and procedures and/or project manuals, the terms of which are hereby incorporated into this Ordinance and any persons violating the same shall be subject to penalties set forth in this Ordinance. Copies of all current rules and regulations and/or policies and procedures and/or project manuals may be obtained from the City Engineer and from the City's website.

ARTICLE X REFERENCES

1. 25 Pennsylvania Code, Chapter 102 Erosion and Sediment Control
2. Minnesota Pollution Control Agency
3. Code of Federal Regulations – Title 44: Emergency Management and Assistance, §9.4 Definitions C
4. *25 Pa. Code Chapter 105*
5. Based on definition in Wisconsin Department of Natural Resources Administrative Rule NR 151.006.
6. Pennsylvania Department of Environmental Protection. No. 363-0300-002 (December 2006), as amended and updated. *Pennsylvania Stormwater Best Management Practices Manual*. Harrisburg, PA.
7. City of Jacksonville website, <http://www3.coj.net/Departments/CityFees/Glossary.aspx>
8. Lancaster County Model Subdivision and Land Development Ordinance.
9. Pennsylvania Department of Environmental Protection. No. 363-2134-008 (March 2012), as amended and updated. *Erosion and Sediment Pollution Control Program Manual*. Harrisburg, PA.
10. CSN Technical Bulletin No. 5, Stormwater Design for High Intensity Redevelopment Projects in the Chesapeake Bay Watershed, version 2.0. Chesapeake Stormwater Network, January 5, 2011 – page 43.
11. “Penn State Urban Hydrology Model User Manual” by Thomas A. Seybert, PE, David F. Kibler, PE, and Elizabeth I. White, PE, August 1993 page 70 and VT/PSUHM help screen.
12. 25 Pa. Code, Chapter 71 Administration of Sewage Facilities Planning Program, § 71.1.

APPENDIX A
WATERSHEDS MAP



APPENDIX NO. B-1

**RUNOFF COEFFICIENTS "C" FOR
RATIONAL FORMULA**

Runoff Coefficients "C" for Rational Formula												
Soil Group	A			B			C			D		
Slope	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
Land Use												
Cultivated Land												
winter conditions	.14	.23	.34	.21	.32	.41	.27	.37	.48	.34	.45	.56
summer conditions	.10	.16	.22	.14	.20	.28	.19	.26	.33	.23	.29	.38
Forest/Woodland	.08	.11	.14	.10	.14	.18	.12	.16	.20	.15	.20	.25
Meadow	Refer to Table 5.2 of the Pa DEP Erosion and Sediment Pollution Control Program Manual (March 2012)											
Grass Areas												
good conditions	.10	.16	.20	.14	.19	.26	.18	.22	.30	.21	.25	.35
average conditions	.12	.18	.22	.16	.21	.28	.20	.25	.34	.24	.29	.41
poor conditions	.14	.21	.30	.18	.28	.37	.25	.35	.44	.30	.40	.50
Impervious Areas	.90	.91	.92	.91	.92	.93	.92	.93	.94	.93	.94	.95
Weighted Residential												
lot size 1/10 acre	.29	.33	.36	.31	.35	.40	.34	.38	.44	.36	.41	.48
lot size 1/4 acre	.26	.30	.34	.29	.33	.38	.32	.36	.42	.34	.38	.46
lot size 1/3 acre	.24	.28	.31	.26	.32	.35	.29	.35	.40	.32	.36	.45
lot size 1/2 acre	.21	.25	.28	.24	.27	.32	.27	.31	.37	.30	.34	.43
lot size 1 acre	.18	.23	.26	.21	.24	.30	.24	.29	.36	.28	.32	.41

Source: Recommended Hydrologic Procedures for Computing Runoff from Small Watersheds in Pennsylvania, 1982, the Pennsylvania State University, Chapter 4, pp 4.18 to 4.19.

APPENDIX NO. B-2

RUNOFF CURVE NUMBERS "CN" FOR SCS METHOD*

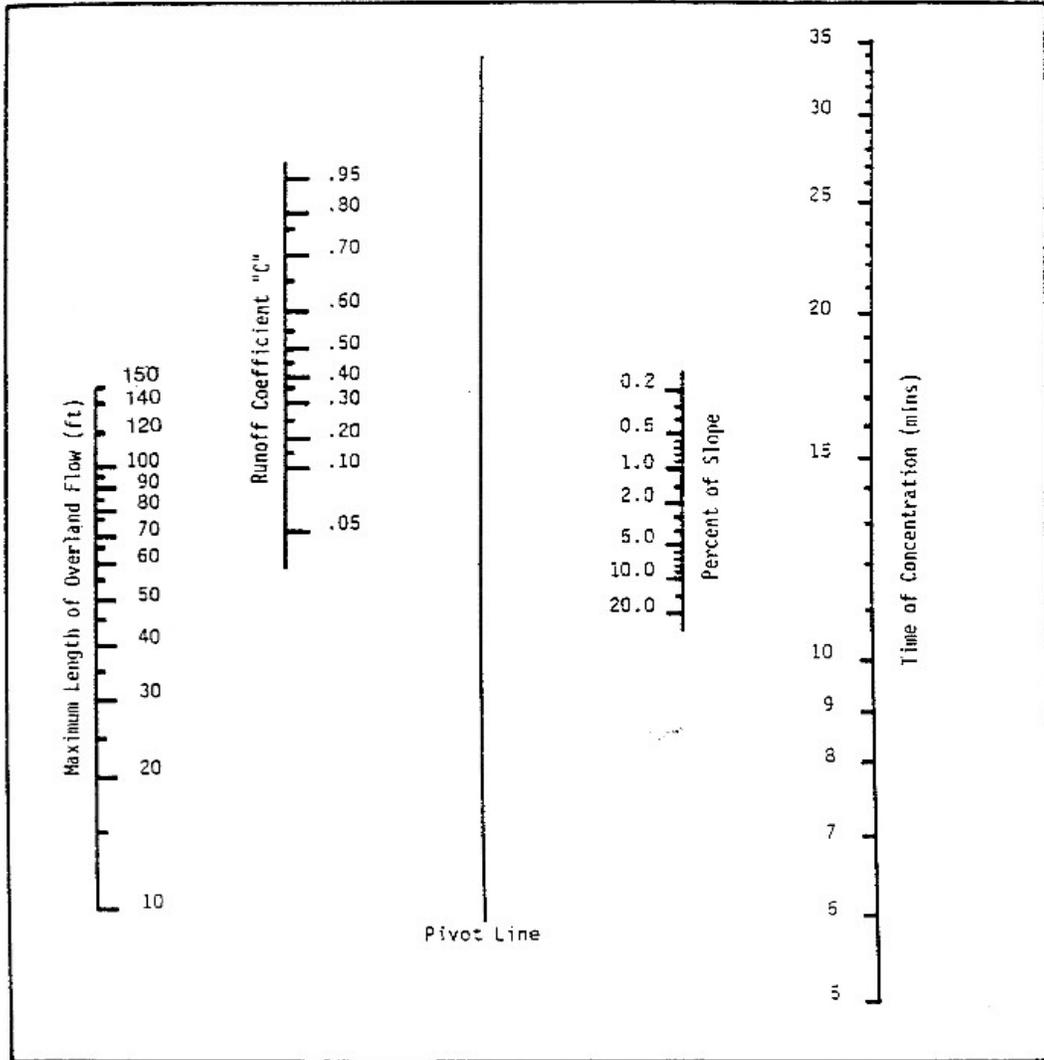
Runoff Curve Numbers "CN" for SCS Method												
Soil Group	A			B			C			D		
Slope	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
Land Use												
Cultivated Land												
winter conditions	48	60	65	62	73	73	68	78	79	77	81	88
summer conditions	35	51	61	48	55	70	57	65	77	64	69	80
Forest/Woodland	30	30	40	42	46	55	45	50	70	50	56	77
Meadow	30	30	30	58	58	58	71	71	71	78	78	78
Grass Areas												
good conditions	35	39	51	48	54	61	56	59	74	62	63	80
average conditions	45	49	53	52	55	69	60	63	79	65	69	84
poor conditions	48	55	68	56	67	79	66	74	86	73	81	89
Impervious Areas	96	97	98	96	97	98	96	97	98	96	97	98
Weighted Residential												
lot size 1/10 acre	71	75	77	74	76	85	78	80	90	81	83	92
lot size 1/4 acre	61	62	67	66	69	75	67	69	83	75	78	87
lot size 1/3 acre	57	59	65	64	66	72	65	66	81	74	77	86
lot size 1/2 acre	54	57	63	62	64	70	63	65	80	72	76	85
lot size 1 acre	51	55	62	61	63	68	61	64	79	71	75	84

***Reference Tables 2-2a, 2-2b and 2-2c of TR-55 for all other land uses not specified in the table**

APPENDIX NO. B-3

NOMOGRAPH FOR DETERMINING SHEET FLOW

(for use with the Rational Method)



APPENDIX NO. B-4

Worksheet #1: Time of concentration (T_c) or travel time (T_t)

Project _____ By _____ Date _____

Location _____ Checked _____ Date _____

Circle one: Present Developed _____

Circle one: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)	Segment ID				
1. Surface description (table 3-1)					
2. Manning's roughness coeff., n (table 3-1)					
3. Flow length, L (total L ≤ **150 ft) ft					
4. Two-yr 24-hr rainfall, P ₂ in					
5. Land slope, s ft/ft					
6. $T_t = \frac{0.007 (nL)^{0.8}}{P_2^{0.5} s^{0.4}}$ Compute T _t hr		+		=	
Shallow concentrated flow	Segment ID				
7. Surface description (paved or unpaved)					
8. Flow length, L ft					
9. Watercourse slope, s ft/ft					
10. Average velocity, V (figure 3-1) ft/s					
11. $T_t = \frac{L}{3600 V}$ Compute T _t hr		+		=	
Channel flow	Segment ID				
12. Cross sectional flow area, a ft ²					
13. Wetted perimeter, P _w ft					
14. Hydraulic radius, $r = \frac{a}{P_w}$ Compute r ft					
15. Channel slope, s ft/ft					
16. Manning's roughness coeff., n					
17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V ft/s					
18. Flow length, L ft					
19. $T_t = \frac{L}{3600V}$ Compute T _t hr		+		=	
20. Watershed or subarea T _c or T _t (add T _t in steps 6, 11, and 19) hr				=	

*Table 3-1 per latest TR-55, Urban Hydrology for Small Watershed
 **150' sheet flow length per latest TR-55 revision

APPENDIX NO. B-5

AVERAGE VELOCITIES FOR ESTIMATING TRAVEL TIME FOR SHALLOW CONCENTRATED FLOW

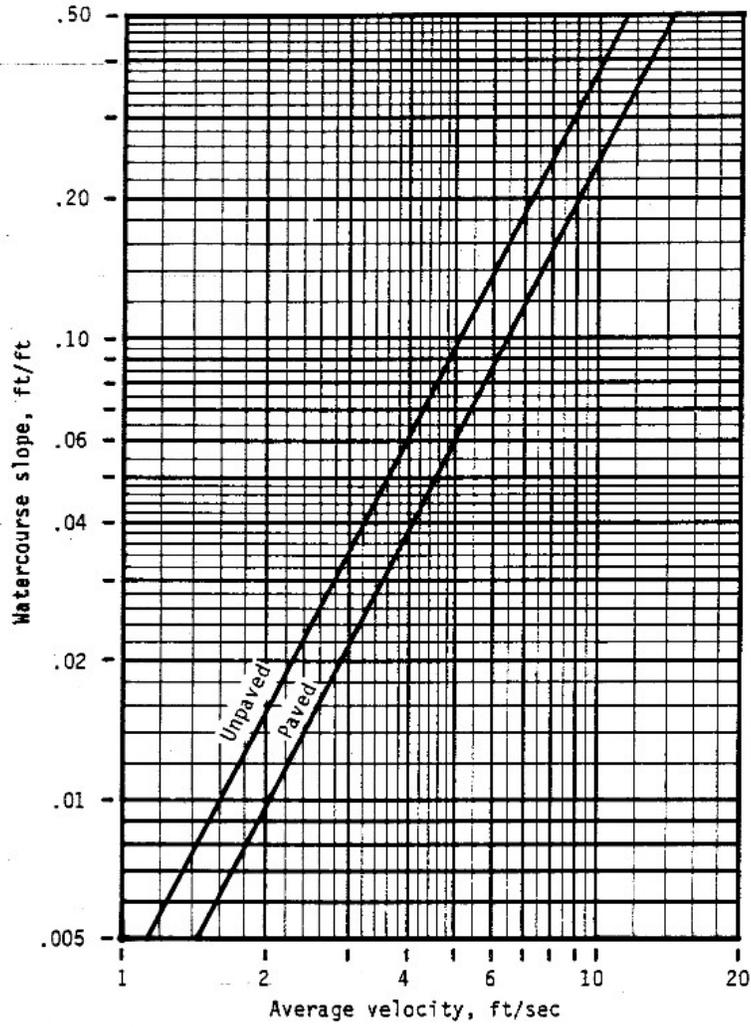


Figure 3-1.—Average velocities for estimating travel time for shallow concentrated flow.

APPENDIX C

**OPERATION AND MAINTENANCE (O&M) AGREEMENT
STORMWATER MANAGEMENT FACILITIES**

THIS AGREEMENT, made and entered into this _____ day of _____, 20____, by and between _____, (hereinafter the “Landowner”), and _____, _____ County, Pennsylvania, (hereinafter “City of Lancaster”);

WITNESSETH

WHEREAS, the Landowner is the owner of certain real property as recorded by deed in the land records of _____ County, Pennsylvania, Deed Book _____ at page _____, (hereinafter “Property”).

WHEREAS, the Landowner is proceeding to build and develop the Property; and

WHEREAS, the SWM FACILITIES Operation and Maintenance (O&M) Plan approved by the City of Lancaster (hereinafter referred to as the “O&M Plan”) for the property identified herein, which is attached hereto as Appendix A and made part hereof, as approved by the City of Lancaster, provides for management of stormwater within the confines of the Property through the use of Stormwater Management Best Management Practices (BMPs); and

WHEREAS, the City of Lancaster, and the Landowner, his successors and assigns, agree that the health, safety, and welfare of the residents of the City of Lancaster and the protection and maintenance of water quality require that on-site SWM Facilities be constructed and maintained on the Property; and

WHEREAS, the City of Lancaster requires, through the implementation of the SWM Site Plan, that SWM Facilities as required by said SWM Site Plan and the Municipal Stormwater Management Ordinance be constructed and adequately operated and maintained by the Landowner, successors, and assigns.

NOW, THEREFORE, in consideration of the foregoing promises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The Landowner shall construct the SWM Facilities in accordance with the plans and specifications identified in the SWM Site Plan.
2. The Landowner shall operate and maintain the SWM Facilities as shown on the SWM Plan in good working order in accordance with the specific operation and maintenance requirements noted on the approved O&M Plan.

3. The Landowner hereby grants permission to the City of Lancaster, its authorized agents and employees, to enter upon the property, at reasonable times and upon presentation of proper credentials, to inspect the SWM Facilities whenever necessary. Whenever possible, the City of Lancaster shall notify the Landowner prior to entering the property.
4. In the event the Landowner fails to operate and maintain the SWM Facilities per paragraph 2, the City of Lancaster or its representatives may enter upon the Property and take whatever action is deemed necessary to maintain said SWM Facilities. It is expressly understood and agreed that the City of Lancaster is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the City of Lancaster.
5. In the event the City of Lancaster, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Landowner shall reimburse the City of Lancaster for all expenses (direct and indirect) incurred, plus a 10% penalty, within 10 days of receipt of invoice from the City of Lancaster.
6. The intent and purpose of this Agreement is to ensure the proper maintenance of the onsite SWM Facilities by the Landowner; provided, however, that this Agreement shall not be deemed to create or affect any additional liability of any party for damage alleged to result from or be caused by stormwater runoff.
7. The Landowner, its executors, administrators, assigns, and other successors in interests, shall release the City of Lancaster from all damages, accidents, casualties, occurrences, or claims which might arise or be asserted against said employees and representatives from the construction, presence, existence, or maintenance of the BMP(s) by the Landowner or City of Lancaster.
8. The City of Lancaster intends to inspect the SWM Facilities at a minimum of once every three years to ensure their continued functioning.

This Agreement shall be recorded at the Office of the Recorder of Deeds of _____ County, Pennsylvania, and shall constitute a covenant running with the Property and/or equitable servitude, and shall be binding on the Landowner, his administrators, executors, assigns, heirs, and any other successors in interests, in perpetuity.

ATTEST:

WITNESS the following signatures and seals:
(SEAL) For the City of Lancaster:

For the Landowner:

ATTEST:

_____ (City, Borough, Township)

County of _____, Pennsylvania

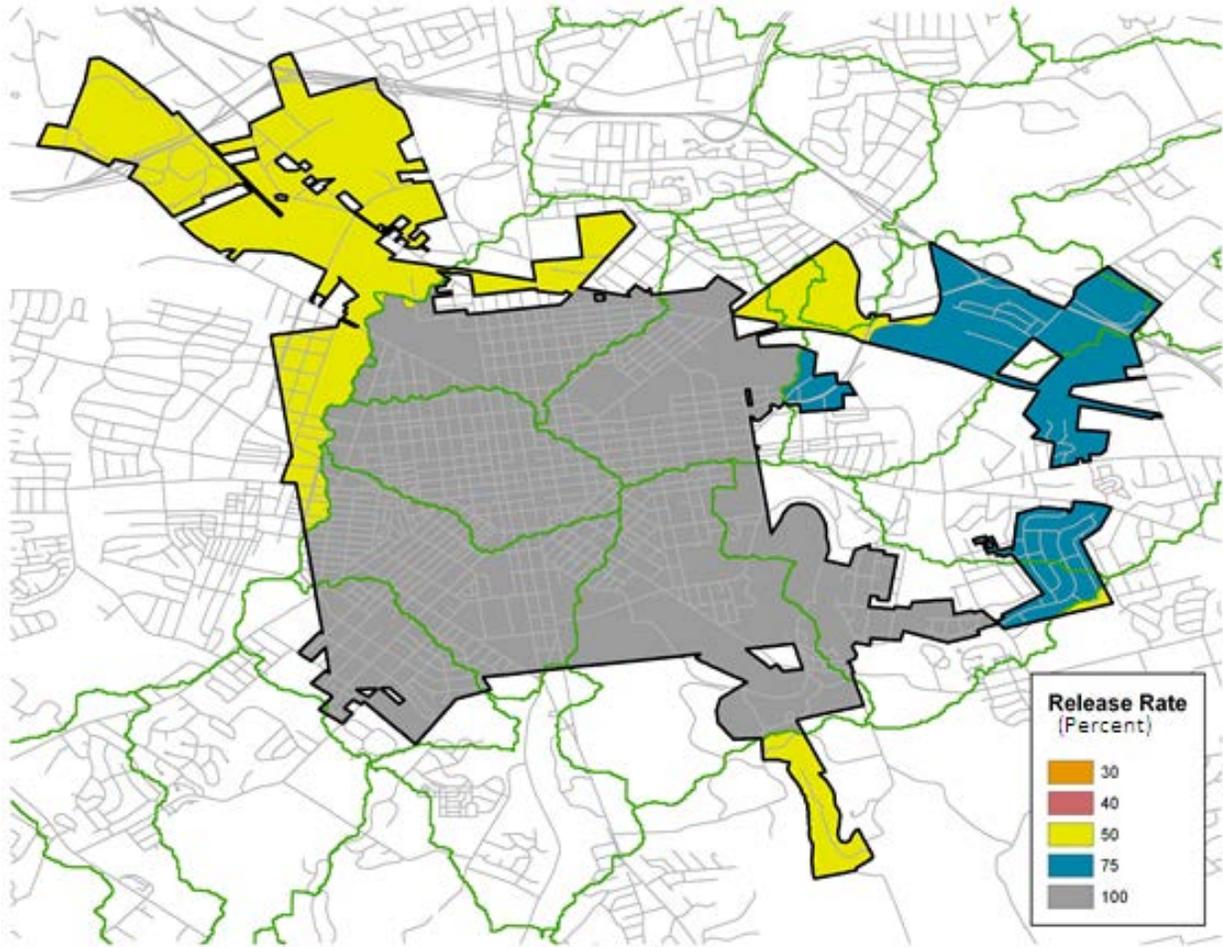
I, _____, a Notary Public in and for the county and state aforesaid, whose commission expires on the _____ day of _____, 20____, do hereby certify that _____ whose name(s) is/are signed to the foregoing Agreement bearing date of the _____ day of _____, 20____, has acknowledged the same before me in my said county and state.

GIVEN UNDER MY HAND THIS _____ day of _____, 20____.

NOTARY PUBLIC (SEAL)

APPENDIX D

Release Rate Map



APPENDIX E

Requirement for Erosion and Sediment Controls

- A. No Regulated Activities or MS4 Regulated Earth Disturbance Activities within the City of Lancaster shall commence until an Erosion and Sediment Control Plan for construction activities has been approved by the City.
- B. The Pennsylvania Department of Environmental Protection (DEP) has regulations that require an Erosion and Sediment Control Plan for any earth disturbance activity of 5,000 square feet or more, under 25 Pa. Code § 102.4(b).
- C. In addition, under 25 Pa. Code Chapter 92, a DEP NPDES permit for stormwater discharges associated with construction activities is required for any earth disturbance one acre or more with a point source discharge to surface waters or the City's storm sewer system, or five acres or more regardless of the planned runoff (hereinafter collectively referred to as "MS4 Regulated Earth Disturbance Activities"). This includes earth disturbance on any portion of, part of, or during any stage of, a larger common plan of development if DEP issues an NPDES permit, a municipality may assume that DEP is satisfied with the storm water management facilities a developer proposes.
- D. Evidence of any necessary permit(s) for MS4 Regulated Earth Disturbance Activities from the appropriate DEP regional office or County Conservation District must be provided to the City. The issuance of an NPDES construction permit (or permit coverage under the Statewide General Permit) satisfies the requirements of subsection A.
- E. A copy of the Erosion and Sediment Control plan and any required permit, as required by DEP regulations, shall be available at the project site at all times

SECTION 2. This Ordinance shall become effective as provided by the laws of the Commonwealth of Pennsylvania.

DULY ORDAINED AND ENACTED this ____ day of _____, 2015,
by the Council of the City of Lancaster, Lancaster County, Pennsylvania, in lawful
session duly assembled.

ATTEST:
LANCASTER

CITY OF

Bernard W. Harris Jr.
Mayor

, City Clerk

J. Richard Gray,