

STORM WATER MANAGEMENT ORDINANCE

Upper Leacock Township, Lancaster County, Pennsylvania

Upper Leacock Township

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RETTEW Project No. 057392011

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UPPER LEACOCK TOWNSHIP
Lancaster County, Pennsylvania

ORDINANCE NO. 2014-07

UPPER LEACOCK TOWNSHIP STORM WATER MANAGEMENT ORDINANCE; TO RESTATE AND ESTABLISH STORM WATER MANAGEMENT REGULATIONS WITHIN UPPER LEACOCK TOWNSHIP, LANCASTER COUNTY, PENNSYLVANIA, INCLUDING, BUT NOT LIMITED TO, REGULATIONS FOR STORM WATER MANAGEMENT STANDARDS, INFORMATION TO BE INCLUDED ON OR WITH STORM WATER MANAGEMENT SITE PLANS, APPLICATION/PLAN PROCESSING PROCEDURES, OPERATION AND MAINTENANCE, AND ENFORCEMENT PROVISIONS.

Now Therefore, Be it enacted and ordained and it is hereby enacted and ordained by the Board of supervisors of Upper Leacock Township that the Upper Leacock Township Storm Water Management Ordinance of 2014 is hereby adopted and enacted, to read as follows:

ARTICLE I. GENERAL PROVISIONS

Section 101. TITLE

This Ordinance shall be known and may be cited as "The Upper Leacock Township Storm Water Management Ordinance," and shall repeal and replace in its entirety "The Upper Leacock Township Storm Water Management Ordinance of 2006" as adopted by Ordinance No. 99-1 and any ordinance inconsistent with any provisions of this ordinance.

Section 102. STATEMENT OF FINDINGS

- 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 control efforts in downstream communities, reduces groundwater recharge, threatens public health and safety, and increases nonpoint source pollution of water resources. Inadequate maintenance of storm water best management practices (BMPs) causes loss of water quality, flooding, and other problems.

- B. A comprehensive program of Storm Water Management, including reasonable regulation of development and activities causing accelerated runoff, is fundamental to the public health, safety, welfare, and the protection of the people of the Municipality and all the people of the Commonwealth, their resources, and the environment. A program of reasonable regulation of connections and discharges to municipal stormwater management facilities will be beneficial.
- C. Storm water 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 municipalities to implement a program of storm water controls. These municipalities are required to obtain a permit for storm water discharges from their separate storm sewer systems 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).

Section 103. PURPOSE

The purpose of this Ordinance is to promote the public health, safety, and welfare by minimizing the harms and maximizing the benefits described in Section 102 of this Ordinance and by establishing a comprehensive storm water management program designed to:

- A. Control accelerated runoff and erosion and sedimentation problems at their source by regulating activities which cause such problems; thereby protecting downstream properties.

- B. Utilize and preserve the desirable existing natural drainage systems within the Township.
- C. Maintain the existing flows and quality of watercourses in the Township and the Commonwealth.
- D. Preserve and restore the flood carrying capacity of watercourses.
- E. Provide for proper operation and maintenance of all BMPs and other permanent storm water management facilities which are constructed in the Township.
- F. Ensure consistency and compliance with the recommendations for quantity and quality controls, within the Lancaster County Act 167 Watershed Storm Water Management Plan, “Blueprints”, for managing storm water runoff adopted by the county of Lancaster as required by the Act of October 4, 1978, P.L. 864, (Act 167), as amended, and known as the “Storm Water Management Act.” Also, by reference, the Conestoga River Watershed Act 167 Storm Water Management Plan and Mill Creek Watershed Act 167 Storm Water Management Plan.
- G. Encourage the recharge of groundwater within the Township.
- H. Meet legal water quality requirements under state law, including regulations in PA DEP Chapter 93 to protect, maintain, reclaim, and restore the existing and designated uses of the Waters of this Commonwealth.
- I. Provide procedures, performance standards and design criteria for Storm Water Management and planning.
- J. Prevent accelerated erosion, scour, aggradation, and degradation of stream banks and streambeds.
- K. Provide standards to meet NPDES MS4 permit requirements.
- L. Promote storm water runoff prevention through the use of nonstructural BMPs.
- M. Provide a regulatory environment that supports the proportion, density and intensity of development called for in the comprehensive plan; allow for creative methods of improving

water quality and managing storm water runoff; and promote a regional approach to water resource management.

- N. Help preserve and protect exceptional natural resources, and conserve and restore natural resource systems.
- O. Promote storm water management practices that emphasize infiltration, evaporation, and transpiration.

Section 104. AUTHORITY

- A. Primary Authority: The Board of Supervisors of Upper Leacock Township is empowered to regulate land use activities that affect runoff by the authority of the Act of October 4, 1978, P.L. 864 (Act 167), the "Storm Water Management Act" and pursuant to the express and implied powers granted to the Board of Supervisors under the Second Class Township Code, Act of May 1, 1933, P.L. 103, No. 69 and as amended, 53 P.S. 65101 et seq). Also by the authority of 35 P.S. Section 691.1 et seq. the Pennsylvania Clean Streams Law.
- B. Secondary Authority: The Board of Supervisors of Upper Leacock Township 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, as amended.

Section 105. APPLICABILITY

The provisions, regulations, limitations, and restrictions of this Article shall apply to the following activities:

- A. Installation and proper operation and maintenance of all BMPs and other permanent storm water management facilities and appurtenances thereto.
- B. All activities that may contribute non-storm water discharges to the municipality's regulated small MS4, where applicable.

- C. Development of any use within a floodprone area as delineated by the Township Zoning Ordinance.
- D. Development of any kind where a preliminary and/or final subdivision or land development plan is required by the Upper Leacock Subdivision and Land Development Ordinance.
- E. Development of any commercial use, industrial use, multi-family dwelling unit, mobile home park, school, church, lodge, club, or any other use determined by the Township to be of similar character.
- F. Construction of new or additional impervious surfaces such as driveways, parking lots, etc.
- G. Construction of new buildings or additions to existing buildings.
- H. Diversion or piping of any natural or man-made stream channel.
- I. Installation of storm water management facilities or appurtenances thereto.
- J. Any other activities where the Township determines that said activities may adversely affect any existing watercourse, storm water management facilities, storm water drainage patterns, or downstream properties.

Exemptions to the applicability section are defined in Section 402. All site developments which do not fall under the exemption criteria in Section 402 shall submit a Storm Water Management Site Plan to the municipality for review.

Section 106. COMPATIBILITY WITH OTHER PERMIT AND ORDINANCE REQUIREMENTS

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 code, rule, act or ordinance. If more stringent requirements concerning regulation of storm water or erosion and sedimentation control are contained in these permits or approvals, the more stringent regulation shall apply.

Section 107. MUNICIPAL LIABILITY

The making of an administrative decision shall not constitute a representation, guarantee or warranty of any kind by Upper Leacock Township or by any official or employee thereof, of the practicability or safety of any proposed structure or use with respect to damage from erosion, sedimentation, storm water runoff or floods, and shall create no liability upon, or cause of action against, the Township, its officials or employees. The Board of Supervisors, by enacting and amending this Chapter, does not waive or limit any immunity granted to the Township and its officials and employees by the Governmental Immunity Act, 42 Pa. C.S.A.8541 et seq and does not assume any liabilities or obligations.

Section 108. ABROGATION AND GREATER RESTRICTIONS

This Ordinance supersedes any provisions currently in effect with respect to Storm Water Management and Erosion Control. However, all other ordinances and regulations shall remain in full force and effect to the extent that those provisions are more restrictive.

Section 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. No action may be taken by a board, agency or employee of the Township purporting to validate such a violation.

Section 110. ORDINANCE CONSTRUCTION

Nothing in this Ordinance shall be construed to affect any suit or proceeding pending in any court, or any rights or liability incurred, or any permit issued, or any approval granted, or any cause or causes of action existing prior to the enactment of this Ordinance.

ARTICLE II. DEFINITIONS

Section 201. GENERAL TERMS

For the purposes of this Ordinance, certain terms and words used herein shall be interpreted as follows:

- A. Words used in the present tense include the future tense; the singular number includes the plural, and the plural number includes the singular; words of masculine gender include those of feminine gender and vice-versa.
- B. The word “includes” or “including” shall not limit the term to the specific example but is intended to extend its meaning to all other instances of like kind and character.
- C. The word “person” includes an individual, firm, association, organization, partnership, trust, company, corporation, or any other similar entity.
- D. The words “shall” and “must” are mandatory; the words “may” and “should” are permissive.
- E. The words “used or occupied” include the words “intended”, “designed”, “maintained”, or “arranged to be used or occupied.”
- F. Any words not defined within this Ordinance or in the Upper Leacock Township Subdivision and Land Development Ordinance, Upper Leacock Township Zoning Ordinance, or Section 107 of the MPC shall be construed as defined in standard dictionary definitions.
- G. References to officially adopted regulations, standards, or publications of PA DEP or other governmental agencies shall include the regulation, publication, or standard in effect on the date that a Storm Water Management Site Plan is first filed. It is the intent of the Board of Supervisors in enacting this Ordinance to incorporate such changes to statutes, regulations, and publications to the extent authorized by 1 Pa. C.S. Section 1937.

Section 202. DEFINITIONS

Accelerated Erosion - The removal of the surface of the land through the combined action of man's activities and natural processes at a rate greater than would occur because of the natural processes alone.

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

Act 167 Plan - A reference to the Mill Creek Watershed Act 167 Storm Water Management Plan, and the Conestoga River Watershed Act 167 Storm Water Management Plan.

Agricultural Activity - The tilling of the soil, the raising of crops, forestry, horticulture, and gardening, including the keeping or raising of livestock and poultry, and including plowing, disking, harrowing, pasturing, installation of conservation measures, and sale of crops and agricultural, dairy and horticultural farm products incidental to the operation of a farm. Construction of new buildings or impervious areas is not considered an agricultural activity.

Alluvial Soils - Soils formed from material such as gravel, sand, or silt deposited by a stream of water and showing little or no modification of the original materials by soil forming processes. These soils may be identified by the Soil Survey of Lancaster County, Pennsylvania, or through an on-site analysis.

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; any land disturbance.

Animal Heavy Use Areas – A barnyard, feedlot, loading area, exercise lot, or other similar area on an agricultural operation where due to the concentration of animals, it is not possible to establish and maintain vegetative cover of a density capable of minimizing accelerated erosion and

sedimentation by usual planting methods. The term does not include entrances, pathways and walkways between areas where animals are housed or kept in concentration.

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

BMP (Best Management Practice) – Activities, facilities, control measures, planning or procedures used to minimize accelerated erosion and sedimentation and manage storm water 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 activities. Storm water BMPs are commonly grouped into one (1) of two (2) broad categories or measures: "non-structural" or "structural". "Non-structural" BMPs are measures referred to as operational and/or behavior-related practices that attempt to minimize storm water runoff generation resulting from an alteration of the land surface or the contact of pollutants with storm water runoff, whereas "structural" BMPs are measures that consist of a physical device or practice that is installed to capture and treat storm water runoff. "Structural" BMPs include, but are not limited to, a wide variety of practices and devices, from large-scale wet ponds and constructed wetlands, to small-scale underground treatment systems, infiltration facilities, filter strips, low impact design, bioretention, wet ponds, permeable paving, grassed swales, riparian or forested buffers, sand filters, detention basins, and manufactured devices. "Structural" storm water BMPs are permanent appurtenances to the project site.

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

Building – See most recent version of Upper Leacock Township Subdivision and Land Development Ordinance.

Board of Supervisors - The Board of Supervisors of Upper Leacock Township, Lancaster County, Pennsylvania.

Carbonate Geology - Limestone or dolomite, as shown on the Geologic Map of Pennsylvania 1980 as amended, published by the Pennsylvania Department of Environmental Protection, Bureau of Topographic and Geological Survey.

Channel - A natural or artificial watercourse with a definite bed and banks which confine and conduct continuously or periodically flowing water.

Channel Flow - That water which is flowing within the limits of a defined channel.

Cistern - An underground reservoir or tank for storing rainwater.

Conservation District – A conservation district, as defined in Section 3(c) of the Conservation District Law (3 P. S. § 851(c)) that has the authority under a delegation agreement executed with DEP to administer and enforce all or a portion of the regulations promulgated under 25 Pa. Code 102.

Conservation Plan - A plan for agriculture land that includes maps and narrative and includes at a minimum an Erosion and Sedimentation Control Plan as required by PA DEP Chapter 102 of the PA Clean Streams Law and approved by the Lancaster County Conservation District.

Construction - The construction, reconstruction, renovation, repair, extension, expansion, alteration, or relocation of a building or structure, including the placement of mobile homes.

Conveyance - 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 carries a stream under or through an embankment or fill.

Design Storm - The magnitude of precipitation from a storm event measured in probability of occurrence (e.g., 50-year storm) and duration (e.g., 24-hour), and used in computing storm water management control systems.

Designee - The agent of the Upper Leacock Township Supervisors involved with the administration, review or enforcement of any provisions of this Ordinance.

Detention Basin - A basin designed to drain completely after retarding storm water runoff by temporarily storing the runoff and releasing it at a predetermined rate.

Detention Volume – The volume of runoff that is captured and released into the waters of this Commonwealth at a controlled rate.

Developer - A person, partnership, association, corporation, or other entity, or any responsible person therein or agent thereof, that undertakes any regulated activity of this Ordinance.

Development - Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations.

Development Site - The specific area of land for which a regulated activity is proposed, planned, conducted or maintained.

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

Disturbed Area – An area where a land disturbance activity is occurring or has occurred.

Drainage Easement - A right granted by a landowner to a grantee, allowing the use of private land for storm water management purposes.

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 materials.

Engineer - A professional engineer registered by the Commonwealth of Pennsylvania.

Environmentally Sensitive Area - slopes greater than 15 percent, shallow bedrock (located within six [6] feet of ground surface²), wetlands, Natural Heritage Areas and other areas designated as Conservation or Preservation areas 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.

Ephemeral Stream - A transient stream, one that flows for a relatively short time.

Erosion - The movement of soil particles by the action of water, wind, ice, or other geological agents.

Erosion and Sediment Pollution Control Plan - A plan which is designed to minimize accelerated erosion and sedimentation.

Existing Conditions - The initial condition of a project site prior to the proposed regulated activity. If the initial condition of the site is not forested or undeveloped land, the land use shall be considered as "meadow" unless the natural land cover is documented to generate lower Curve Numbers or Rational "C" Coefficients, such as forested lands.

Facility Depth - For above ground detention/retention/BMP facilities, the facility depth is defined to be the depth between the bottom invert of the lowest orifice and the invert of the spillway. If

there is no spillway, the top of the berm shall be used. For basins with no orifices or outlet structure, the bottom elevation of the basin shall be used.

FEMA - The United States Federal Emergency Management Agency or any agency successor thereto.

Fill - Material placed or deposited so as to form an embankment or raise the surface elevation of the land, including but not limited to levees, bulkheads, dikes, jetties, embankments, and causeways.

Flood, Flooded, or Flooding - A partial or complete inundation of normally dry land areas from the overflow of a watercourse or other body of surface water, or from the unusual and rapid accumulation or runoff of surface waters from any source.

Floodplain – The area defined as the Floodplain Zone in the Upper Leacock Township Zoning Ordinance.

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.

Freeboard - A vertical distance between the 100-year design elevation of the water surface at the emergency spillway, in a condition that assumes the primary outlet(s) are blocked, and the top of a dam, levee, tank, basin, berm, or diversion ridge.

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

Grade - A slope, usually of a road, channel or natural ground specified in percent and shown on plans as specified herein.

Grassed Waterway - A natural or constructed waterway, usually broad and shallow, covered with erosion-resistant grasses, used to conduct surface water from cropland.

Groundwater Recharge - Replenishment of existing natural underground water supplies.

Hydrologic Soil Group (HSG) - The classification of soils according to their runoff-producing characteristics by NRCS. Soils are classified into four HSGs (A, B, C, and D) according to their minimum infiltration rate, which is obtained for bare soil after prolonged wetting. The NRCS defines the four groups and provides a list of most of the soils in the United States and their group classification. The soils in the area of the development site may be identified from a soil survey report that can be obtained from local NRCS offices or conservation district offices. Soils become less pervious as the HSG varies from A to D.

Impervious Surface - A surface which prevents the percolation of water into the ground. All structures, buildings, parking areas, driveways, roads, streets, sidewalks, decks, and any areas of concrete, asphalt, packed stone, and compacted soil shall be considered impervious surface if they prevent infiltration.

Infiltration Structures - A structure designed to direct runoff into the ground.

Intermittent Stream - A body of water flowing in a channel or bed composed primarily of substrates associated with flowing water, which, during periods of the year, is below the local water table and obtains its flow from both surface runoff and groundwater discharges.

Land Development – See most recent version of Upper Leacock Township Subdivision and Land Development Ordinance.

Land Disturbance - Any activity that causes an alteration to the natural condition of the land involving but not limited to: clearing and grubbing, grading, excavations, embankments, or filling of ground or stripping of vegetation or any other activity; 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; the erection of a dwelling or other structure; or the modification, removal, filling, or alteration of an existing storm water management facility or drainage easement. Land Disturbance Activities shall be classified as follows:

A. Major Land Disturbance Activity:

- (1) Any use requiring the submission of a subdivision or land development plan as herein defined;
- (2) Any land disturbance not defined as a minor land disturbance activity or deemed to qualify as a minor land disturbance activity by the Township;
- (3) Any use involving the diversion or piping of any natural or man-made watercourse or existing drainage pattern;

B. Minor Land Disturbance Activity:

- (1) The use of land on an existing lot of record, including subdivided lots or land developments approved under a Major Land Disturbance Activity, provided that:
 - (a) The use is not within a floodplain area;
 - (b) No diversion or piping of any natural or man-made water course or existing drainage pattern is involved;
 - (c) A use that does not:
 - Create more than 5,000 square feet of impervious area; or,
 - Involve the removal of ground cover, grading, filling, or excavation of more than 5,000 square feet, either of which shall be measured on a cumulative basis from (*the date of enactment of this Ordinance*).
 - (d) The use does not require the submission of a subdivision or land development plan as herein defined.

- (2) Any use of the land, which in the opinion of the Township, represents minimal land disturbance or impact to the environment.

Landowner - The legal, beneficial, equitable owner or owners of land, including the holder of an option or contract to purchase, a lessee if he is authorized under the lease to exercise rights of the landlord, or other persons 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 effluent. Seasonal high water tables, whether perched or regional, also constitute a limiting zone.

Lineament - A fracture on the order of tens of kilometers long usually extending to the basement below, or the lowest level of, sedimentary rock.

Maximum Extent Practicable (MEP) – Applies when the Applicant demonstrates to the Township’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.

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, storm water or other wastes; (2) designed or used for collecting or conveying storm water; (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).

Municipality - The Township of Upper Leacock, Lancaster County, Pennsylvania.

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.

NOAA Atlas 14 - Precipitation-Frequency Atlas of the United States, Atlas 14, Volume 2, US Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, Hydrometeorological Design Studies Center, Silver Spring, Maryland (2004). NOAA's Atlas 14 can be accessed at Internet address: <http://hdsc.nws.noaa.gov/hdsc/pfds/>.

NPDES - National Pollution Discharge Elimination System, the federal government’s system for issuance of permits under the Clean Water Act, which is delegated to DEP in Pennsylvania.

NRCS – USDA Natural Resources Conservation Service (previously SCS).

Obstruction - Any dam, wall, wharf, embankment, levee, dike, pile, abutment, projection, refuse, fill, structure, or other matter in, along, across, or projecting into any channel, watercourse, or floodplain, which may impede, retard, or change the direction of the flow of water, or that is placed where the flow of water might carry the same downstream to cause damage to life or property.

100-Year Flood - A flood which is likely to be equaled or exceeded once every 100 years (i.e. that has a one percent chance of being equaled or exceeded in any given year).

100-Year Flood Boundary - The outer boundary of an area of land that is likely to be flooded once every 100 years (i.e. that has a one percent chance of being flooded each year).

100-Year Flood Elevation - The water surface elevations of the 100-Year Flood.

Ordinance - The Upper Leacock Township Storm Water Management Ordinance.

Outfall - (i) Point where water flows from a conduit, stream, or drain; (ii) "Point Source" as described in 40 CFR § 122.2 at the point where the Township storm sewer system discharges to surface Waters of this Commonwealth.

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

PA DEP Chapter 102 also 25 PA DEP Chapter 102 - Chapter 102 of the regulations of PA DEP, 25 Pa. Code Sect. 102.1 et seq (Erosion and Sediment Control).

PA DEP Chapter 105 - Chapter 105 of the regulations of PA DEP, 25 Pa. Code Sect. 105.1 et seq (Dam Safety and Waterway Management).

PA DEP Chapter 106 - Chapter 106 of the regulations of PA DEP, 25 Pa. Code Sect. 106.1 et seq (Floodplain Management).

Peak Discharge - The maximum rate of flow of water at a given point and time resulting from a specified storm event.

Pipe - An enclosed water carrying structure of one or more barrels having a total flow area equivalent to 48-inch diameter or less.

Planning Commission - The Planning Commission of Upper Leacock Township, Lancaster County, Pennsylvania.

Project Site - The specific area of land where any regulated activities in the Township are planned, conducted, or maintained.

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 - Storm Water Management controls used to manage the peak flows for the purposes of channel protection and flood mitigation.

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

Regulated Activities - Any land disturbance activities or any activities that involve the alteration or development of land in a manner that may affect storm water runoff.

Regulated Earth Disturbance Activity – Activity involving earth disturbance subject to regulation under 25 Pa. Code 92, PADEP Chapter 102, or the Clean Streams Law.

Retention Basin - A basin designed to retain storm water runoff with its primary release of water being through the infiltration of said water into the ground.

Retention Volume/Removed Runoff – The volume of runoff that is captured and not released directly into the surface waters of this Commonwealth during or after a storm event.

Return Period – The average interval, in years, within which a storm event of a given magnitude can be expected to occur one time. For example, the 25-year return period rainfall would be expected to occur on average once every 25 years; or the probability of a 25-year storm occurring in any one year is 0.04 (i.e., a four [4] percent chance).

Riparian Buffer - A vegetated area bordering perennial and intermittent streams and wetlands, that serves as a protective filter to help protect streams and wetlands from the impacts of adjacent land uses.

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.

Runoff - That part of precipitation which flows over the land.

SCS - Soil Conservation Service, U.S. Department of Agriculture (U.S.D.A.).

Sediment - Solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by water.

Sediment Basin - A barrier, dam, retention or detention basin designed to retain sediment.

Seepage Pit/Seepage Trench - An area of excavated earth filled with loose stone or similar material and into which storm water runoff is directed for infiltration into the ground.

Soil Conservation Service (SCS) - Now known as National Resource Conservation Service (NRCS).

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).

Soil Horizon - A layer of soil or soil material approximately parallel to the land surface and differing from adjacent genetically related layers in physical, chemical, and biological properties or characteristics such as color, structure, texture, consistency, kinds and number of organisms present, degree of acidity or alkalinity, etc.

Soil Survey Report - The latest published version of the United States Department of Agriculture Soil Survey for Lancaster County, Pennsylvania.

Spillway - A depression in the embankment of a pond or basin which is used to pass peak discharge greater than the maximum design storm controlled by the pond.

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 storm water.

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

Storm Sewer - A system of pipes, conduits, swales or other similar structures including appurtenant works which carries intercepted runoff, and other drainage, but excludes domestic sewage and industrial wastes.

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

Storm Water Management - A program of controls and measures designed to regulate the quantity and quality of storm water runoff from a development while promoting the protection and conservation of groundwaters and groundwater recharge.

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

Storm Water Management Facilities - Those controls and measures, including BMPs, used to effect a storm water management program.

Storm Water 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. Also, a Post-Construction Storm Water Management (PCSM) Plan, as required by an NPDES permit.

Stormwater Management Plan - The Lancaster County Act 167 Watershed Stormwater Management Plan, “Blueprints”, for managing stormwater runoff adopted by the county of Lancaster as required by the Act of October 4, 1978, P.L. 864, (Act 167), as amended, and known as the “Storm Water Management Act.” Also, by reference, the Mill Creek Watershed Act 167 Storm Water Management Plan and the Conestoga River Watershed Act 167 Storm Water Management Plan.

Storm Water Management Site Plan (SWM Site Plan) - The Plan prepared by the Developer or his representative indicating how storm water runoff will be managed at a particular development site according to this Ordinance.

Subdivision - See most recent version of Upper Leacock Township Subdivision and Land Development Ordinance.

Swale - A wide shallow ditch which carries surface water runoff.

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.

Township - The Township of Upper Leacock, Lancaster County, Pennsylvania.

USDA – United States Department of Agriculture or any agency successor thereto.

Watercourse - A stream of water; river; brook; creek; or a channel or ditch for water, whether natural or manmade, having a defined bed and banks with perennial or intermittent flow.

Watershed - All the land from which water drains into a particular watercourse.

Waters of this 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.

Wetlands - 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. The term includes but is not limited to wetland areas listed in the State Water Plan, the United States Forest Service Wetlands Inventory of Pennsylvania, the Pennsylvania Coastal Zone Management Plan and a wetland area designated by a river basin commission. This definition is used by the United States Environmental Protection Agency [USEPA] and the United States Army Corps of Engineers [USACOE].

ARTICLE III. DESIGN STANDARDS

Section 301. GENERAL REQUIREMENTS

The following general standards shall be applied to all regulated activities to promote flow attenuation, erosion and sediment control and flood control, unless the otherwise regulated activity is specifically exempted in Section 402.

- A. All Storm Water Management Site Plans shall be designed and certified by individuals registered in the Commonwealth of Pennsylvania and qualified to perform such duties.
- B. No regulated activities shall commence until the municipality issues written approval of Storm Water Management Site Plan, which demonstrates compliance with the requirements of this Ordinance, and has received approval from the Lancaster County Conservation District of a written Erosion and Sediment Pollution Control Plan as specified in 25 PA DEP Chapter 102 (where applicable).
- C. Modifications of the provisions of this Ordinance shall be as specified in Section 804.
- D. Storm Water Management Site Plans approved by the municipality, in accordance with Sections 404 and 405, shall be on site throughout the duration of the regulated activity.
- E. For all regulated earth disturbance activities, erosion and sediment control BMPs shall be designed, implemented, operated, and maintained during the regulated earth disturbance activities (e.g., during construction) to meet the purposes and requirements of this Ordinance and to meet all requirements under Title 25 of the Pennsylvania Code, the Clean Streams Law, and the Stormwater Management Act.
- F. Any storm water management facilities regulated by this Ordinance that will be located on, or which will discharge onto State Highway rights-of-way shall be subject to approval by PennDOT. If PennDOT requires that the Township be the permittee for such drainage facilities, the Applicant shall enter into an Agreement, in recordable form, assuming all of the obligations which PennDOT may place upon the Township as permittee, including, but not limited to, long-term maintenance of any such facilities, compliance with all conditions

contained in the permit, and indemnification of the Township for any costs or penalties which PennDOT may seek to impose on the Township. The Township shall have no obligations to make any applications to PennDOT.

- G. Storm water management facilities located within or affecting the floodplain of any watercourse shall also be subject to the requirements of Section 307 of this Ordinance, the Township Zoning Ordinance and any future Ordinance which regulates construction and development within areas of the Township subject to flooding.
- H. Storm water discharge points onto an adjacent property shall comply with the following:
 - 1. Storm water flows onto adjacent property shall not be created, increased, relocated, or otherwise altered without written approval of the adjacent property owner(s), including the establishment of an easement(s). Such storm water flows shall be subject to the requirements of this Ordinance. If, in the opinion of the Township, a decrease in storm water flow rate or volume will cause adverse impacts to downstream properties, the applicant shall mitigate such impacts.
 - 2. Storm water runoff from a project site shall flow directly into a natural watercourse or into an existing storm sewer system. If neither of these is available, the Applicant shall obtain an easement from the downstream landowner(s) to allow the site's runoff discharge to reach a natural watercourse or an existing storm sewer system through the easement. If an easement is obtained, post-developed flow characteristics must be similar to or better than the runoff characteristics (spread, velocity, and peak rate) of the pre-developed flows. The downstream system design shall conform to the design requirements of this Ordinance. The use of level spreaders is prohibited.
- I. Storm water runoff shall not be transferred from one watershed to another unless the watersheds are sub-watersheds of a common watershed which join together within the perimeter of the property, or both of the following apply: 1) the effect of the transfer does not alter the peak discharge (in conformance with the requirements of the Act 167 Plan) onto adjacent lands, and, 2) drainage easements from the affected landowners are provided.

- J. All storm water runoff flowing over the project site shall be considered in the design of the storm water management facilities.
- K. When Final Plan applications are submitted in sections, and if temporary facilities are required for construction of a section, such facilities shall be included in the submitted plans for that section. In the event temporary measures cannot adequately handle the storm water runoff, the main outfall line and other required facilities shall be included as part of the construction of the proposed section.
- L. Innovative methods for the detention and control of storm water runoff may be used when approved by the Township. Various combinations of methods should be tailored to suit the particular requirements of the type of development and the topographic features of the project site. The following is a partial listing of detention and control methods which can be utilized in storm water management systems where appropriate:
- (1) Detention basins
 - (2) Retention basins (subject to prior Township approval)
 - (3) Rooftop storage
 - (4) Parking lot ponding
 - (5) Seepage pits, seepage trenches or other infiltration structures, provided these systems are not situated in areas underlain by carbonate geology
 - (6) Concrete lattice block surfaces
 - (7) Grassed channels and vegetated strips
 - (8) Cisterns and underground reservoirs, provided these systems are not situated in areas underlain by carbonate geology
 - (9) Routed flow over grass
 - (10) Decreased impervious surface coverage

- M. The following principles shall be applied to the design plan and construction schedule to minimize soil erosion and sedimentation:
- (1) Stripping of vegetation, grading, or other soil disturbance shall be done in a manner which will minimize soil erosion.
 - (2) Whenever feasible, natural vegetation shall be retained and protected.
 - (3) The extent of the disturbed area and the duration of its exposure shall be kept to a minimum, within practical limits.
 - (4) Either temporary seeding, mulching, or other suitable stabilization measures shall be used to protect exposed critical areas during construction.
 - (5) Drainage provisions shall accommodate the storm water runoff both during and after construction.
 - (6) Soil erosion and sedimentation facilities shall be installed prior to any on-site grading.
- N. The velocity to be used in the design of a piped storm water conveyance system shall be based on the maximum velocity obtainable. The capacity shall be based upon full flow conditions.
- O. Inlets, culverts, and basin discharge systems shall be designed for the worst case condition. Inlet capacity shall be based on design data provided by the manufacturers and accepted by the Township. If acceptable information is not available, inlets in non-ponding areas shall be designed for a maximum capacity of four (4) cubic feet per second (cfs). Where ponding occurs, inlet capacity shall be based on accepted engineering design practices. Culvert design shall consider either inlet/outlet control or a combination of hydraulic losses through the system, whichever is greater. Basin discharge systems shall be designed to the same standards as culverts. If it cannot be readily determined which hydraulic condition controls, the basin discharge rate shall be based on the highest possible discharge rating curve with the basin capacity sized to store the excessive storm runoff based on the lowest possible discharge rating curve.

- P. The existing points of concentrated drainage that discharge onto adjacent property shall not be relocated and shall be subject to any applicable discharge criteria specified in this Ordinance.
- Q. Where a Development is traversed by watercourses other than permanent streams, a drainage easement shall be provided conforming substantially to the line of such watercourses. The terms of the easement shall prohibit excavation, the placing of fill or structures, and any alterations that may affect adversely the flow of storm water within any portion of the easement. Also, maintenance and mowing of vegetation within the easement shall be required.
- R. The PA DEP Chapter 105, Rules and Regulations, apply to the construction, modification, operation, or maintenance of both existing and proposed water obstructions and encroachments throughout the watershed, including work in wetlands. Inquiries on permit requirements or inquiring on dam safety should be addressed to the PA DEP, Bureau of Dams, Waterways & Wetlands - Harrisburg.
- S. When it can be shown that, due to topographic conditions, natural drainageways on the site cannot adequately provide for drainage, open channels may be constructed conforming substantially to the line and grade of such natural drainageways. Work within natural drainageways shall be subject to approval by PA DEP through the Joint Permit Application process, or, where deemed appropriate by PA DEP, through the General Permit process.

- T. In areas of sinkhole activity and karst-related features, as identified on the “Sinkholes and Karst-Related Features of Lancaster County, Pennsylvania, Open File Report: 9001” or in areas that the Township has reason to believe sinkhole activity exists, a registered professional geologist shall address sinkholes and karst-related activities and shall certify to the following:
- (1) No storm water facilities shall be placed in, over, or immediately adjacent to the following features:
 - (a) sinkholes;
 - (b) closed depressions;
 - (c) lineaments in carbonate areas;
 - (d) fracture traces;
 - (e) caverns;
 - (f) intermittent lakes;
 - (g) ephemeral streams; or
 - (h) bedrock pinnacles (surface or subsurface).
 - (2) Storm water management basins shall not be located closer than 100 feet from the rim of sinkholes or closed depressions, nor within 100 feet from disappearing streams; nor shall these basins be located closer than 50 feet from lineaments or fracture traces; nor shall these basins be located closer than 25 feet from surface or identified subsurface pinnacles.
 - (3) Storm water resulting from land development activities shall not be discharged into sinkholes.

- (4) It shall be the developer's responsibility to verify if the development is underlain by carbonate geology. The following note shall be attached to all Storm Water Management Site Plans and signed and sealed by the developer's qualified professional, "I, _____, certify that the proposed detention basin is/is not (*circle one*) underlain by carbonate geology."
- (5) Whenever a storm water facility will be located in an area underlain by carbonate geology, a geological evaluation of the proposed location by a Registered Professional Geologist shall be conducted to determine susceptibility to sinkhole formation. The evaluation may include the use of impermeable liners to reduce or eliminate the separation distances listed in Section 301.T.(2).

U. All regulated activities which do not fall under the exemption criteria in Section 402 shall submit a storm water management site plan to the municipality for review. The exemption criteria in Section 402 shall apply to the total proposed development even if development is to take place in stages.

- V. Impervious areas:
1. The measurement of impervious area shall apply to 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.
 4. Volume controls in Section 308 and the peak rate controls of Section 301.Z do not need to be retrofitted to existing impervious areas that are not being altered by the proposed regulated activity.
- W. Detention/Infiltration Standards: Post-development rates of runoff from any regulated activity shall not exceed the peak rates of runoff prior to development as described in Sections 301.Z.
- X. 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. 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.
- Y. Match Pre-Development Hydrograph: Developers and/or landowners are encouraged to provide infiltration facilities or utilize other techniques which will allow the post-development hydrograph to match the pre-development 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 (5) minutes and a rate variation of up to five (5) percent 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 described in Section 308 may be used as part of this option.

- Z. Where the pre-development hydrograph cannot be matched, the calculated peak rates of runoff for storm water originating on the project site must meet the following conditions, for all watersheds flowing from the project site:
1. For all areas within the Mill Creek watershed, as established by the Lancaster County Act 167, Mill Creek Watershed Storm Water Management Plan, storm water management facilities shall be provided so the peak discharge of the calculated post-development runoff from any regulated activity is reduced in accordance with the Lancaster County, Act 167 Mill Creek Watershed Storm Water Management Plan, as amended. The Upper Leacock Township Watershed Storm Water Management Plan specific to Upper Leacock Township and consistent with the Lancaster County, Act 167 Mill Creek Watershed Storm Water Management Plan is included in Appendix No. 9.
 2. For all areas within the Conestoga River watershed, as established by the Lancaster County Act 167, Conestoga River Watershed Storm Water Management Plan, storm water management facilities shall be provided so the peak discharge of the calculated post-development runoff from any regulated activity is reduced in accordance with the Lancaster County, Act 167 Conestoga River Watershed Storm Water Management Plan, as amended. The Upper Leacock Township Watershed Storm Water Management Plan specific to Upper Leacock Township and consistent with the Lancaster County, Act 167 Conestoga River Watershed Storm Water Management Plan is included in Appendix No. 9.
- AA. Developers have the option to propose a regional storm water management plan or participate in a regional storm water management plan developed by others. A regional storm water management plan may include offsite volume and rate control, as appropriate and supported by a detailed design approved by the Township. A regional storm water management plan must meet all of the volume and rate control standards required by this Ordinance for the area defined by the regional storm water management plan, but not necessarily for each individual development site. Appropriate agreements must be established to ensure the requirements of this Ordinance and the requirements of the regional storm water management plan are met.

- AB. To the maximum extent practicable, incorporate the techniques for Low Impact Development (LID) Practices found in Appendix 8 and described in the BMP Manual. The proposed LID Practices shall be noted on the Storm Water Management Site Plan.
- AC. Infiltration BMPs, to the extent practicable, should be spread out, made as shallow as practicable, and located to maximize use of natural on-site infiltration features while still meeting the other requirements of this Ordinance.
- AD. Normally dry, open top, storage facilities shall completely drain the volume control storage over a period of time not less than 24 hours and not more than 72 hours from the end of the design storm. However, any infiltration at such facilities is exempt from the minimum 24 hour standard, i.e. may infiltrate in a shorter period of time, since this water will not be discharged into waters of this Commonwealth.
- AE. 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.
- AF. The design storm volumes and precipitation intensities to be used in the analysis of peak rates of discharge shall be as required in Sections 302.B and 302.D.
- AG. The applicant shall refer to the BMP Manual for various BMPs and their design standards.
- AH. Storm Water Management Facilities intended to receive and infiltrate runoff from regulated activities shall be selected based on suitability of soils and site conditions and shall be constructed on soils that have the following characteristics:
1. Infiltration testing shall be conducted in accordance with the methods specified in the BMP Manual.
 2. Soils underlying storm water management facilities that are designed to include infiltration shall have a percolation rate of at least 0.1 inch per hour and not more than ten (10) inches per hour (after application of the appropriate safety factor from the BMP manual).

3. A minimum separation of 24 inches between the bottom of the facility and the limiting zone, unless it is demonstrated to the satisfaction of the Township that the selected BMP has design criteria which allow for a smaller separation.
4. A stabilized infiltration rate is to be determined in the same location and within the same soil horizon as the bottom of the infiltration facility. The stabilized infiltration rate is to be determined as specified in the BMP Manual.
5. The Township shall be notified 24 hours prior to infiltration tests being conducted to provide an opportunity for the Township to witness the tests.

AI. The Municipality 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.)

AJ. 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.

Section 302. METHODS OF CALCULATION OF RUNOFF

- A. Storm water runoff from all development sites shall be calculated using either the modified rational method or a soil-cover-complex methodology.

Any storm water runoff calculations involving drainage areas greater than 50 acres, including on- and off-site areas, shall use a generally accepted calculation technique that is based on the SCS Soil Cover Complex Method. SCS TR-55 method is recommended for design of storm water management facilities where storm water runoff volume must be taken into consideration. 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 site.

**Table III-1
Acceptable Computation Methodologies
For Storm Water Management Site Plans**

Method	Method Developed By	Applicability
TR-20 (or commercial package based on TR-20)	USDA SCS	Applicable where use of full hydrology computer model is desirable or necessary.
TR-55 (or commercial package based on TR-55)	USDA SCS	Applicable for land development plans within limitations described in TR-55.
HEC-1	US Army Corps of Engineers	Applicable where use of full hydrologic computer model is desirable or necessary.
PSRM	Penn State University	Applicable where use of full hydrologic computer model is desirable or necessary; simpler than TR-20 or HEC-1.
Rational Method (or commercial computer package based on Rational Method)	Emil Kuichling (1889)	For sites less than 50 acres, or as approved by the Municipal Engineer.
Other Methods	Varies	Other computation methodologies approved by the Municipal Engineer.

- B. If the SCS Method (also known as Soil-Cover-Complex Method) is used, the design storm volumes to be used in the analysis of peak rates of discharge shall be obtained from the Precipitation-Frequency Atlas of the United States, Atlas 14, Volume 2, Version 3.0, U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Weather Service, Hydrometeorological Design Studies Center, Silver Spring, Maryland. NOAA's Atlas 14 can be accessed at:
http://hdsc.nws.noaa.gov/hdsc/pfds/orb/pa_pfds.html
1. Provide the rainfall used for the two (2), ten (10), 25, 50, and 100 year 24 hour storm events. Rainfall values vary throughout the county depending on location.
 2. Provide the location (longitude and latitude) or a description of the location for which the rainfall applies.
 3. If rainfalls from more than one (1) location are used, provide the methodology by which the design rainfall was calculated.
- 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 NOAA Atlas 14 data shall be used to determine the rainfall intensity in inches per hour based on the information for the five (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 time of three times the time of concentration ($3xT_c$) and the descending leg shall have a time of seven (7) times the time of concentration ($7xT_c$) to approximate an SCS type II hydrograph.
- 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 storm water runoff from the project site.

G. For the purpose of calculating pre-development on-site peak discharges, all runoff coefficients shall be based on actual land use assuming summer or good land conditions. Runoff coefficients for off-site discharges shall be based on actual land use assuming winter or poor land conditions.

H. Criteria and assumptions to be used in the determination of storm water runoff and design of management facilities are as follows:

(1) Runoff coefficients should be based on the information contained in Appendix 1 and Appendix 2 if the actual land use is listed in those Appendices. If the actual land use is not listed in these Appendices, runoff coefficient shall be chosen from other published documentation, and a copy of said documentation shall be submitted with the storm water management report.

(2) Times of concentration 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 150 feet. Sheet flow may be determined using the nomograph in Appendix 3, or the Manning's kinematic solution shown in the Sheet Flow section of Worksheet No. 1 in Appendix 4.

(b) Shallow concentrated flow: Travel time for shallow concentrated flow shall be determined using Figure 3-1 from the TR-55, Urban Hydrology for small watersheds, as shown in Appendix 5.

A Sample worksheet for calculating times of concentration is provided in Appendix 4.

(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 and downstream end of the site between these

design points shall be based upon Manning's Equation and/or acceptable engineering design standards as determined by the Township Engineer.

Section 303. DESIGN STANDARDS - WATER CARRYING FACILITIES

- A. All storm sewer pipes, culverts and bridges (excluding detention and retention basin outfall structures) conveying water originating only from within the boundaries of the project site shall be designed for a 25 year storm event. All storm sewer pipes, culverts and bridges (excluding detention and retention basin outfall structures) conveying water originating from off-site shall be designed for a 50 year storm event. Drainage easements shall be provided to contain and convey the 100 year frequency flood throughout the project site. Easements shall begin at the furthest upstream property line of the proposed development in a watershed.
- B. A concentrated discharge of storm water to an adjacent property shall be within an existing watercourse or enclosed in an easement. The easement shall be accessible from the street.

C. Conveyance facilities shall comply with the design criteria in the following table:

Conveyance Facility Design Criteria			
Location	Within public street right-of-way	Outside public street right-of-way	
Loading	All	Vehicular loading	Non-vehicular loading
(a) Pipe design			
[1] Material	SLHDPE, RCP	SLHDPE, RCP	SLHDPE, RCP
[2] Slope (minimum)	0.5%	0.5%	0.5%
[3] Cover	1 foot to bottom of asphalt	1 foot to bottom of asphalt	1 foot to surface
[4] Diameter (minimum)	18 inches	18 inches	15 inches
[5] Street crossing angle	90°	N/A	N/A
[6] Access/maintenance port frequency (maximum)	400 feet	400 feet	600 feet
(b) Inlet design			
[1] Material	Concrete	Concrete	N/A
[2] Grate depression	N/A	N/A	6" w/ 20:1 side slope
(c) Manhole design			
[1] Material	Concrete	Concrete	Concrete
(d) Swale design			
[1] Freeboard (minimum)	6 inches	N/A	6 inches
[2] Velocity (maximum)	Stability check	N/A	Stability check
[3] Slope (minimum)	1%	1%	1%
[4] Side slopes (residential area)	4 : 1 max	N/A	4 : 1 max
[5] Side slopes (non-residential area)	4 : 1 max	N/A	3 : 1 max
[6] Bottom width to flow depth ratio	12 : 1	N/A	12 : 1
(e) Outlet design			
[1] End treatment	Concrete Headwall/endwall	Headwall/ endwall or flared end section	Headwall/ endwall or flared end section
[2] Energy dissipater	Required	Required	Required

D. Storm sewer pipes and culverts shall be installed on sufficient slopes to provide a minimum velocity of three (3) feet per second when flowing full.

- E. All storm sewer pipe and culverts shall be laid to a minimum depth of one (1) foot from bottom of asphalt to the crown of pipe in paved areas and one (1) foot from finished grade to the crown of pipe in grassed areas.
- F. Curves in pipes or box culverts without an inlet or manhole are prohibited. Tee joints, elbows and wyes are also prohibited.
- G. Manholes, inlets, headwalls and endwalls proposed for dedication or located along streets shall conform to the requirements of the Pennsylvania Department of Transportation, Bureau of Design, Standards for Roadway Construction, Publication No. 72, in effect at the time the design is submitted, or as otherwise modified by the Township.
- H. Headwalls endwalls, and flared end sections shall be used where storm water runoff enters or leaves the storm sewer horizontally from a natural or manmade channel.
- I. Inlets shall be placed on both sides of the street at low spots, at points of abrupt changes in the horizontal or vertical directions of storm sewers, and at points in gutters so that flow does not exceed three (3) inches. Inlets shall normally be along the curb line at or beyond the curb radius points. For the purpose of inlet location at corners, the depth of flow shall be considered for each gutter. At intersections, the depth of flow across the through streets (proposed and existing) shall not exceed one and one-half (1 ½) inches for the 25 year storm event. Manholes may be substituted for inlets at locations where inlets are not required to handle surface runoff.
- J. Storm water roof drains, sump pumps, and pipes shall not directly discharge water into a street right-of-way or sanitary sewer.
- K. All existing and natural watercourses, channels, drainage systems and areas of surface water concentration shall be maintained in their existing condition unless an alteration is approved by the Township and the appropriate state or federal agencies, if necessary.
- L. Flow velocities from any storm sewer may not result in erosion of the receiving channel.

M. Energy dissipators shall be placed at the outlets of all storm sewer pipes, culverts, and bridges where flow velocities exceed maximum permitted channel velocities as specified below:

- (1) Three (3) feet per second where only sparse vegetation can be established and maintained because of shade or soil condition.
- (2) Four (4) feet per second where normal growing conditions exist and vegetation is to be established by seeding.
- (3) Five (5) feet per second where a dense, vigorous sod can be quickly established or where water can be temporarily diverted during establishment of vegetation. Netting and mulch or the equivalent methods for establishing vegetation shall be used.
- (4) Six (6) feet per second where there exists a well established sod of good quality.

N. The following conditions shall be met for all swales:

- (1) Capacities and velocities shall be computed using the Manning equation. The design parameters shall be as follows:
 - (a) For vegetated swales, two (2) design considerations shall be met:
 - (i) The first shall consider channel velocity and stability based upon a low degree of retardance (" n " = .03);
 - (ii) The second shall consider channel capacity based upon a high degree of retardance (" n " = .05).

All vegetated swales shall have a minimum slope of one (1) percent unless otherwise approved by the Township Supervisors.

- (b) The " n " factors to be used for paved or rip-rap swales or gutters shall be based upon accepted engineering design practices as approved by the Township.
- (2) All swales shall be designed to maximize infiltration and concentrate low flows to minimize siltation and meandering, unless geotechnical conditions do not permit infiltration.

O. Manning " n " values used for design of pipes and culverts shall be in accordance with Appendix 6.

- P. Storm facilities not located within a public right-of-way shall be centered within the easement. The easement shall be accessible from the street.
- Q. Adequate erosion protection shall be provided along all open channels and at all points of discharge.
- R. A note shall be provided on the plan indicating that the developer/owner grants the Township the right of access to all storm water management easements on the project site via the access drives, driveways, parking areas, etc., within the site.
- S. Within the public street right-of-way, the gutter spread based on the 25 year storm shall be no greater than one half of the travel lane and have a maximum depth of three (3) inches at the curb line. A parking lane shall not be considered as part of the travel lane. In the absence of pavement markings separating a travel lane from the parking lane, the parking lane shall be assumed to be seven (7) feet wide if parking is permitted on the street.
- T. All inlets placed in paved areas shall have heavy duty bicycle-safe grating consistent with PennDOT Publication 72M, latest edition. A note to this effect shall be added to the Storm Water Management Site Plan or inlet details therein.
- U. Where the connecting pipe has a diameter 18 inches or greater, headwalls and endwalls shall be provided with a protective barrier device to prevent entry of the storm sewer pipe by unauthorized persons. Such protection devices shall be designed to be removable for cleaning.
- V. All storm sewer pipes, culverts, manholes, inlets, endwalls and end sections shall be constructed in accordance with Pennsylvania Department of Transportation, Form 408, as amended.
- W. Material consistency and placement depths for storm sewer pipe backfill shall be (at a minimum) per all applicable pipe manufacturer's recommendations, further providing it should be free of large (not exceeding six [6] inches in any dimension) stone, rock, or other objectionable or detritus material.

- X. Inlets, junction boxes, or manholes greater than five (5) feet in depth shall be equipped with non-aluminum ladder rungs and shall be detailed on the Storm Water Management Site Plan.
- Y. In designated Wellhead Protection Areas, the applicant shall demonstrate, to the satisfaction of the Township, that improvements to the site will not have an adverse effect on the groundwater supply. The Township shall place any restrictions on the improvements that it deems necessary for the protection of the groundwater supply. Within Wellhead Protection Areas, all storm water piping shall be watertight.

Section 304. DESIGN STANDARDS - ABOVE GROUND STORAGE FACILITIES

- A. Above ground storage facilities shall consist of all storm water facilities which store, infiltrate/evaporate/transpire, clean, release, or otherwise affect storm water runoff and the top of which is exposed to the natural environment. Above ground storage facilities shall be located above the finished ground elevation. Above ground storage facilities do not include storm water management facilities designed for conveyance or cisterns.
- B. Facilities with a facility depth greater than eight (8) feet shall not be permitted in residential areas.

C. Above ground storage facilities shall comply with the design criteria in the following table:

Above-Ground Storage Facility Design Criteria			
	Facility Depth		
	Less than 2 feet	2 feet to 8 feet	Greater than 8 feet
(a) Embankment Geometry			
[1] Top width (minimum)	2 feet	5 feet	8 feet
[2] Interior side slope (maximum)	2 : 1	3 : 1	5 : 1
[3] Exterior side slope (maximum)	2 : 1	3 : 1	3 : 1
(b) Embankment Construction			
[1] Key trench	Not required	Required	Required
[2] Pipe collar	Required	Required	Required
[3] Compaction density	Required	Required	Required
(c) Internal Construction			
[1] Dewatering feature	N/A	Required	Required
[2] Pretreatment elements	Not required*	Required	Required
(d) Outlet Structure**			
[1] Pipe size (minimum)	6 inches	15 inches	15 inches
[2] Pipe material	SLHDPE, PVC, RCP	SLHDPE, RCP	SLHDPE,RCP
[3] Anticlogging devices	Required	Required	Required
[4] Antivortex design	Not required	Required	Required
[5] Watertight joints in piping	Required	Required	Required
(e) Spillway Requirements			
[1] Spillway freeboard (minimum)	3 inches	6 inches	12 inches
[2] Width (minimum)	5 feet	10 feet	20 feet
[3] Width (maximum)	20 feet	50 feet	50 feet
[4] Spillway channel design	Required	Required	Required
[5] Routing of 100 year storm	Permitted	Permitted	Permitted

* Except where required by the BMP Manual.

** All discharge control devices with appurtenances shall be made of reinforced concrete and stainless steel.

N/A = Not applicable

SLHDPE = Smooth lined high density polyethylene pipe; PVC = Polyvinyl chloride;

RCP = Reinforced concrete pipe

D. Pretreatment elements shall be designed according to the BMP Manual.

E. All outlet structures and emergency spillways shall include a satisfactory means of dissipating the energy of flow at its outlet to assure conveyance of flow without

endangering the safety and integrity of the basin and the downstream drainage area. The use of level spreaders shall be prohibited.

- F. 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. If basement or underground facilities are proposed, detailed calculations addressing the effects of storm water ponding on the structure and water-proofing and/or flood-proofing design information shall be submitted for approval.
- G. In designated Wellhead Protection Areas, the applicant shall demonstrate, to the satisfaction of the Township, that improvements to the site will not have an adverse effect on the groundwater supply. The Township shall place any restrictions on the improvements that it deems necessary for the protection of the groundwater supply. Within Wellhead Protection Areas, all storm water piping shall be watertight.
- H. Criteria for design and construction of storm water management facilities are not the same criteria that are used in the permitting of dams under the PA DEP Dam Safety Program. Depending upon the physical characteristics of a dam, a dam permit may be required and the design will have to meet the provisions of PA DEP Chapter 105 of the Dam Safety and Encroachment Act. Depending on the physical characteristics of a dam, the design could require that anywhere from a 100 year to a PMF storm event be considered.
- I. All above ground storage facilities shall be structurally sound and shall be constructed of sound and durable materials. All discharge control devices and anticlogging devices with appurtenances shall be made of reinforced concrete and stainless steel. Bolts/fasteners shall be stainless steel. The maximum opening dimensions of all anticlogging devices shall be no greater than one-half of the smallest orifice opening size on which it is protecting. A separation distance of at least one-half of the opening size shall be maintained between the anticlogging device and the orifice being protected. The completed structure and the foundation of all basins shall be stable under all probable conditions of operation. Spillways shall be capable of discharging the peak discharge of a post-development 100-year storm event through the emergency spillway facilities, in a condition that assumes

the primary outlet(s) are blocked, which will not damage the integrity of the facility or the downstream drainage areas. Use of the spillway to convey flows greater than the 50-year design storm shall be permitted.

- J. The effect on downstream areas if the above ground storage facility embankment fails shall be considered in the design of all basins. The basin shall be designed to minimize the potential damage caused by such failure of the embankment.
- K. An easement shall be provided from the spillway outfall to a natural or artificial watercourse.
- L. The maximum depth of water for above ground storage facilities without restricted access shall not exceed six (6) feet unless approved by modification by the Supervisors. Access to basins with a maximum depth of water greater than six (6) feet shall be restricted by fencing that will discourage access.
- M. Above ground storage facilities without restricted access shall have impoundment areas with side slopes no greater than the horizontal to vertical ratios in Section 304.C.(a). Access to basins with steeper side slopes than those shown in Section 304.C.(a) shall be restricted by fencing that will discourage access.
- N. All detention basins shall include an outlet structure to permit draining the Rate Control Volume within 24 hours, exclusive of BMP storage.
- O. All outlet structures and emergency spillways shall include a satisfactory means of dissipating the energy of flow at its outlet to assure conveyance of flow without endangering the safety and integrity of the basin and the downstream drainage area.
- P. An impervious core/key trench, if required, shall consist of a cutoff trench (below existing grade) and a core trench (above existing grade). A key trench may not be required wherever the facility depth is less than two (2) feet or where it can be shown that another design feature, such as the use of an impermeable liner, accomplishes the same purpose. Materials used for the core shall conform to the Unified Soil Classification GC, SC, CH, or CL and must have at least 30 percent passing the No. 200 sieve.

1. The dimensions of the core shall provide a minimum trench depth of two (2) feet below existing grade, minimum width of four (4) feet and side slope of 1H:1V or flatter.
 2. The core should extend up to the 25 year water surface elevation or six (6) inches below the emergency spillway elevation, whichever is lower.
 3. The core shall extend four (4) feet below any pipe penetrations through the impervious core. The core shall be installed along or parallel to the centerline of the embankment.
 4. Compaction requirements shall be the same as those for the embankment to assure maximum density and minimum permeability.
- Q. All pipe collars, if required, shall be designed in accordance with Chapter 7 of the PA DEP Erosion and Sediment Control Manual. The material shall consist of concrete or otherwise non-degradable material around the outfall barrel and shall be watertight.
- R. The embankment fill material shall be free of roots, stumps, wood, rubbish, stones greater than six (6) inches, frozen or other objectionable materials.
- S. The minimum freeboard for spillways shall be provided above the 100-year design elevation of the water surface at the emergency spillway in a condition that assumes the primary outlet(s) are blocked.
- T. Wherever possible, basins shall have a non-uniform (naturalistic) shape, rather than a geometric design in the form of a square or rectangle.
- U. The minimum bottom slope of facilities not designed for infiltration shall be one (1) percent. A flatter slope may be used if an equivalent dewatering mechanism is provided. Low flow channels shall be provided from each water carrying facility to the outlet structure. Low flow channels shall be one (1) percent minimum slope and shall be designed to enable ease of maintenance. Basins designed with a flat bottom in lieu of low flow channels to promote water quality and/or groundwater recharge shall be equipped with

appropriate basin plantings for both wet and dry conditions as well as a permanent maintenance schedule.

- V. If required, dewatering shall be provided through the use of underdrain, surface device, or an alternate approved by the Township Engineer. If the facility is to be used for infiltration, the dewatering device should be capable of being disconnected and only be made operational if the basin is not dewatering within the required timeframe.
- W. Within basins designed for infiltration, existing native vegetation shall be preserved, if possible. For existing unvegetated areas or for infiltration basins that require excavation, a planting plan shall be prepared in accordance with this Ordinance and the BMP Manual.

Section 305. OWNERSHIP, ADMINISTRATION, AND MAINTENANCE OF STORM WATER MANAGEMENT FACILITIES

The final plan shall reflect and/or be accompanied by supporting documentation identifying the ownership of and the method of administering and maintaining all permanent storm water management facilities. The intent of these regulations is to provide private ownership and maintenance of storm water management and erosion and sedimentation control facilities. With regard to the maintenance of these facilities, they must be either:

- A. Dedicated to and accepted by a local municipality; or
- B. Maintained by a private entity (e.g., homeowners association or individuals that own the land) in accordance with the terms of an agreement, declaration of easements or other legally binding documentation approved in form by the Township. The agreement, declaration of easements or other legally binding documentation shall provide that the local municipality shall have the right to:
 - (1) Inspect the facilities at any time.
 - (2) Require the private entity to take corrective measures and assign the private entity reasonable time periods for any necessary action.
 - (3) Authorize maintenance to be done and lien all cost of the work against the properties of the private entity responsible for maintenance.

- C. The agreement, declaration of easements or other legally binding documentation shall be submitted to the Township.
- D. Where deemed necessary and appropriate, the Township may require the agreement to contain provisions requiring the posting and/or periodic payment of escrow funds by the private entity to guarantee proper maintenance of the facility.
- E. The developer shall submit record surveys of all drainage easements and basins to the boundaries of their respective easements, prior to dedication of any project areas.

Section 306. DESIGN STANDARDS - EROSION AND SEDIMENT CONTROL

- A. All earthmoving activities shall be conducted in such a way as to minimize accelerated erosion and resulting sedimentation. Measures to control erosion and sedimentation shall, at a minimum, meet the standards of the Lancaster County Conservation District and PA DEP Chapter 102 (Erosion Control) of Title 25, Rules and Regulations of the Pennsylvania Department of Environmental Protection.
- B. The erosion and sedimentation control plan must be available at all times at the project site. When required, a permit allowing earthmoving activity shall be obtained by the developer before any construction on the project site shall begin.
- C. Approval of an erosion and sedimentation control plan by the Township shall not be construed as an indication that the plan complies with the standards of any agency of the Commonwealth.
- D. The erosion and sedimentation control plan shall be submitted by the developer to the Lancaster County Conservation District for their review and approval and shall address the following, as applicable:
 - 1. Design of the roadway system, including haul roads, skid roads, landing areas, trails, and storage and staging areas.
 - 2. Runoff control structures (e.g., diversions, culverts, detention ponds, etc.).

3. Stream crossings for both perennial and intermittent streams.
 4. Access to public roadways, including design of rock construction entrance for mud and debris control.
 5. A remediation plan for restoring the disturbed area through re-grading, topsoil placement, reseeding, and other stabilization techniques, as required.
- E. The Township shall receive simultaneous copies of plans, reports, applications, and other documents submitted for review by Lancaster County Conservation District.
- F. Evidence of any necessary plan or permit approval for Earth Disturbance activities from PA DEP or the Lancaster County Conservation District must be provided to the Township.
- G. A copy of the Notice of Termination for NPDES Permits shall be provided to the Township once accepted by LCCD.
- H. The following principles shall be applied to the design plan and construction schedule to minimize soil erosion and sedimentation.
1. Stripping of vegetation, grading or other soil disturbance shall be done in a manner that will minimize soil erosion.
 2. Whenever feasible, natural vegetation shall be retained and protected.
- I. In accordance with PA DEP Chapter 102, temporary facilities shall be included in the submitted plans for a phased section where the following conditions are met:
1. A regulated activity constitutes a Subdivision or Land Development.
 2. The Final Plan applications are submitted in sections.
 3. Temporary facilities are required for construction of a section.

Section 307. FLOODPLAIN

Floodplain areas shall be established and preserved in accordance with the Township Zoning Ordinance and as provided below.

A. A 100-year floodplain shall be established for all watercourses and shall be delineated by one of the following methods.

(1) A hydraulic report prepared by an individual registered in the Commonwealth of Pennsylvania to perform such duties.

(2) A hydrologic report prepared by an agency of the county, state, or U.S. Government.

In case of any dispute concerning when, where, and how the floodplain is to be established, the Township will determine the ultimate design criteria and/or flood boundary limits.

The 100-year floodplain delineation shall be shown on the plans.

B. Whenever a floodplain is located within or along a lot, the plan shall include (1) the boundary of the dimensions from the centerline of the watercourse; (2) a plan note that the floodplain shall be kept free of structures, fill, and other encroachments; and (3) a plan note that floor elevations for all structures adjacent to the floodplain shall be two (2) feet above the 100-year flood elevation.

The above provision shall not be construed as a prohibition of the following, provided they comply with Section 307.C:

(1) Storm water management facilities.

(2) Stream improvements whose sole purpose is to improve aquatic life habitat and which are approved by the Pennsylvania Fish Commission.

(3) Farm ponds.

(4) Flood-proofing and hazard reduction structures to protect existing buildings.

(5) Public and private utility facilities, except buildings.

- (6) Water-oriented uses (except buildings), e.g. docks, piers, boat launching ramps, hatcheries.
 - (7) Water monitoring devices.
 - (8) Culverts, bridges, and their approaches for floodplain crossings by streets, access drives, and driveways.
- C. Plans for any of the eight uses within a floodplain permitted under Section 307.B shall be incorporated into the design plans and shall be subject to approval by the Township. The plans shall demonstrate that the proposed uses (1) do not increase the height or frequency of floodplain water, (2) are installed so as to withstand the maximum volume, velocity, and force of floodplain water, (3) are flood and flotation proof, (4) do not create unhealthy or unsanitary conditions, and (5) do not degrade the quality of surface water, or the quality of groundwater.
- D. The inclusion of a floodplain within lots in order to meet minimum lot area and/or yard requirements is allowed provided each such lot contains sufficient area exclusive of the floodplain for buildings and, when applicable, on-lot sanitary sewage disposal systems.
- E. It is recommended that the 500 year floodplain corridor be identified on plans and that any structures located between the 100 and 500 year floodplain be flood-proofed to the limits of the 500 year floodplain corridor.
- F. The boundaries of the 100-year floodplain shall be field staked prior to any on-site construction.

Section 308. DESIGN STANDARDS - VOLUME CONTROL

Water volume controls shall be implemented using the *Design Storm Method* in Subsection A below.

- A. The *Design Storm Method* (CG-1 in the BMP Manual) is applicable to any size of regulated activity. This method requires detailed modeling based on site conditions.
1. Do not increase the post development total runoff volume for all storms equal to or less than the two (2) year 24 hour storm event.
 2. For modeling purposes:
 - a. Existing (predevelopment) non forested pervious areas must be considered meadow in good condition.
 - b. 20 percent of existing impervious area, when present, shall be considered meadow in good condition in the model for existing conditions, subject to the limit stated in Section 301.T.5.
 - 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 would be acceptable if proper justification is submitted and approved.
- B. A detailed geologic evaluation of the Development Site shall be performed in areas of carbonate geology to determine the design parameters of recharge facilities. The evaluation shall be performed by a state licensed/certified Professional Geologist (PG), and shall, at a minimum, address soil permeability, depth to bedrock, susceptibility to sinkhole formation, and subgrade stability.
- C. 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 this Ordinance and the BMP Manual.

2. The volume control storage which will be used for rate control is that storage which is available within 24 hours from the end of the design storm based on the stabilized infiltration rate and/or the evapo-transpiration rate.
- D. Volume Control BMPs and pretreatment elements shall be designed in accordance with the BMP Manual and the soil and infiltration testing requirements of Section 301.
 - E. All applicable worksheets from Chapter 8 of the BMP Manual must be used when establishing Volume Controls.

Section 309. DESIGN STANDARDS FOR SUBSURFACE FACILITIES

A. Subsurface storage facilities shall consist of all storm water facilities which store, infiltrate/evaporate/transpire, clean, release, or otherwise affect storm water runoff and the top of which is not exposed to the natural environment. Subsurface facilities shall be located below the finished ground elevation. Subsurface facilities shall not include storm water management facilities designed for conveyance.

B. Subsurface storage facilities shall comply with the design criteria in the following table:

Subsurface Storage Facility Design Criteria		
	Facility Type	
	Infiltration and Storage	Storage without Infiltration
(a) Facility Geometry		
[1] Depth from surface (maximum)	2 feet less than limiting zone	N/A
[2] Loading ratio (maximum)	Per BMP Manual*	N/A
(b) Distribution System Requirements		
[1] Pipe size (minimum)	4 inches	4 inches
[2] Pretreatment**	Required	Required
[3] Loading/balancing	Required	Not required
[4] Observation/access ports	Required	Required

*unless otherwise determined by professional geologic evaluation

**as specified in the BMP Manual

C. The facility shall be designed to provide a method to eliminate solids, sediment, and other debris from entering the subsurface facility.

D. The facility shall be designed to provide a means of evenly balancing the flow across the surface of the facility to be used for infiltration.

E. For facilities with the bottom less than five (5) feet below the average grade of the ground surface, a clean-out shall be an acceptable observation port. For facilities with the bottom five (5) feet or more below the average grade of the ground surface, a manhole or other means acceptable to the Township shall be provided for access to and monitoring of the facility. The number of access points shall be sufficient to flush or otherwise clean out the system.

- F. Storage and Distribution system piping shall be PVC, SLHDPE, or RCP.
- G. The stone used for infiltration beds shall be clean washed, uniformly graded coarse aggregate. The void ratio for design shall be assumed to be 40 percent.
- H. Material consistency and placement depths for backfill shall be (at a minimum) per all applicable pipe manufacturer's recommendations, further providing it should be free of large (not exceeding six [6] inches in any dimension) stone, rock, or other objectionable or detritus material. Select non-aggregate material should be indigenous to the surrounding soil material for non-vehicular areas. Backfill within vehicular areas shall comply with this section unless otherwise specified in governing municipal road/street or subdivision and land development ordinances. Furthermore, if the design concept includes the migration of runoff through the backfill to reach the infiltration facility, the material shall be well drained, free of excess clay or clay like materials and generally uniform in gradation.
- I. Non-woven geotextiles shall be placed on all sides of subsurface infiltration facilities.
- J. When located under pavement, the top of the subsurface facility shall be a minimum of three (3) inches below the bottom of pavement subbase. Where located under vegetative cover, the top of the subsurface facility shall be a minimum of 12 inches below the surface elevation or as required to establish vegetation.
- K. Subsurface facilities shall be designed to safely convey and/or bypass flows from storms exceeding the design storm.

ARTICLE IV. PLAN REQUIREMENTS

Section 401. GENERAL REQUIREMENTS

- A. Prior to the commencement of any activity regulated by Section 105 and not exempted by Section 402, the developer shall submit a Storm Water Management Site Plan to the Township for approval, including all plans, reports, and correspondence with the Lancaster County Conservation District. A note on the maps shall refer to the associated computations and E&S Pollution Control Plan by title and date. The cover sheet of the computations and E&S Pollution Control Plan shall refer to the associated maps by title and date. All Storm Water Management Site Plan materials shall be submitted to the Municipality in a format that is clear, concise, legible, neat and well organized.
- B. The Township shall not approve any Storm Water Management Site Plan that is deficient in meeting the requirements of this Ordinance. At its sole discretion and in accordance with this Article, when a Storm Water Management Site Plan is found to be deficient, the Township may either disapprove the submission and require a resubmission, or in the case of minor deficiencies, the Township may accept submission of revisions.
- C. A disapproved Storm Water Management Site Plan may be resubmitted, with the revisions addressing the municipality's concerns, to the municipality in accordance with this Article. The applicable review fee must accompany a resubmission of a disapproved Storm Water Management Site Plan.
- D. The developer shall be responsible for reimbursing the Township for reasonable and necessary expenses incurred for the review of the Storm Water Management Site Plan as further specified in Section 404.F.
- E. Provisions shall be made for permanent access or maintenance easements for all existing and proposed physical Storm Water Management facilities and BMPs, such as ponds and infiltration structures, as necessary to implement the Operation and Maintenance (O&M) Plan discussed in Section 401.G and to allow for the provisions of the Storm Water

Management Agreement and Declaration of Easement. All such agreements shall be duly recorded in the Office of the Recorder Deeds and shall constitute a binding permanent covenant upon the property, superior to all liens of record and not subordinate to any easement or restriction that would interfere with its provisions and the implementation thereof.

- F. The following signature block for the municipality shall be provided on the plan:

Upper Leacock Township Storm Water Management Site Plan Approval Certification	
At a meeting on _____, 20____, the Upper Leacock Township Board of Supervisors approved this project, and all conditions have been met. This approval includes the complete set of plans and information that are filed with the Township in File No. _____, based upon its conformity with the standards of the _____ Upper Leacock Township Storm Water Management Ordinance.	
_____	_____
Board Signature	Board Signature

- G. The Storm Water Management Site Plan shall include an Operation and Maintenance (O&M) Plan for all existing and proposed physical Storm Water Management facilities and BMPs. This Plan shall address long-term ownership and responsibilities for O&M as well as schedules and costs for O&M activities.
- H. A minimum 20 foot wide access easement around all Storm Water Management facilities that would provide ingress from and egress to a public right-of-way. Easements shall be provided to allow for the collection and discharge of water, the inspection, maintenance, repair and reconstruction of the drainage facilities, and the passage of machinery for work.
- I. The Storm Water Management Site Plan shall include a note on the plan informing the owner that the Municipality shall have the right of entry for the purposes of inspecting all storm water conveyance, treatment, or storage facilities.

- J. A soil E&S Pollution Control Plan, including all reviews and approvals, as required by PA DEP or the Lancaster County Conservation District shall be provided to the municipality prior to final plan approval.
- K. A Declaration of Adequacy / Highway Occupancy Permit shall be provided from the PennDOT District Office when utilization of a PennDOT storm water facility is proposed.
- L. For any activities that require a PA DEP Joint Permit Application and are regulated under PA DEP Chapter 105 or PA DEP 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 Storm Water Management Site Plan and must be obtained prior to final plan approval.
- M. A modification to a submitted Storm Water Management Site Plan that involves a change in Storm Water Management BMPs or techniques, or that involves the relocation or redesign of Storm Water Management BMPs, or that is necessary because soil or other conditions are not as stated on the Storm Water Management Site Plan as determined by the municipality shall require a resubmission of the modified Storm Water Management Site Plan in accordance with this Article.

Section 402. EXEMPTIONS

Regulated Activities meeting the following criteria are exempt from the requirement to submit a Storm Water Management Site Plan:

- A. Lands improved with existing structures may be exempted for an additional 1,000 square feet of impervious surface, initially or cumulatively from the effective date of this Ordinance, in all zones provided that flows from the site after development leave the site in the same manner as the pre-development condition;
- B. Any Applicant desiring exemption from design, plan submission, and plan processing requirements shall complete an application for exemption in the form available at the Township and pay any applicable filing fee.

- C. The Applicant for exemption shall provide the Township with all information necessary for the Township to determine that:
1. There shall be no disturbance of land within floodplains, wetlands, environmentally sensitive areas, riparian forest buffers, or slopes greater than 15 percent.
 2. No impervious surface coverage shall be installed and no land disturbance activity shall be conducted within any existing drainage or storm water easement created by or shown on any recorded plan.
 3. The Applicant shall minimize soil disturbance, take steps to minimize erosion and sedimentation during construction activity, and promptly reclaim all disturbed areas with topsoil and vegetation.
 4. The Applicant shall take steps that runoff be directed to pervious areas on the subject property. No runoff shall be directed onto an abutting street or neighboring property.
 5. The proposed impervious surface shall not adversely impact any existing known problem areas or downstream property owners or the quality of runoff entering any storm sewer.
 6. The proposed impervious surface and/or grading shall not create accelerated erosion and sedimentation.
- D. If the proposed activity does not meet all of the criteria set forth in Section 402.C above, the Applicant may consider the Minor Land Disturbance processing procedure in Section 403.
- E. No Applicant and no activity is exempt from complying with any state or federal requirements applicable if the subject property is located in a High Quality (HQ) or Exceptional Value (EV) watershed.
- F. No Applicant and no activity shall violate or cause to be violated: the Federal Clean Water Act or any regulation issued thereunder, an NPDES permit, any recorded Storm Water Management or Operations and Maintenance Agreement, or any requirement applicable to a Municipal Separate Storm Sewer System.

Section 403. PLAN CONTENTS – MINOR LAND DISTURBANCE

- A. The Minor Land Disturbance Plan shall include a general plan of the lot configuration, existing and proposed building location, grading, storm water management facilities, and erosion and sedimentation control facilities.
- B. Although the plan need not demonstrate literal compliance with all provisions of plan requirements within Section 404 and the Design Standards of Article III, the plan must demonstrate that the proposed activity will comply with the purpose of this Ordinance as outlined within Section 103.
- C. The Minor Land Disturbance Plan shall provide for volume control but shall not be required to provide for rate control. Additional guidance is available at the Township.
- D. The Code Enforcement Officer may require additional information or invoke any section of this Ordinance deemed necessary to adequately demonstrate compliance with the intent of this Ordinance. The requirements of the Code Enforcement Officer may be appealed to the Board of Supervisors in accordance with Section 603 of this Ordinance.

Section 404. PLAN CONTENTS – MAJOR LAND DISTURBANCE

- A. The following items shall be included as part of the Storm Water Management Site Plan:
 - (1) Plans, showing the following information:
 - (a) General
 - (i) All plans shall be on sheet sizes consistent with the Township Subdivision and Land Development Ordinance.
 - (ii) Proposed name or identifying title of project.
 - (iii) Name and address of the landowner and developer of the project site.
 - (iv) Plan date and date of the latest revision to the plan, north point, graphic scale and written scale. All plans shall be at a scale of ten

(10), 20, 40, or 50 feet to the inch unless the Subdivision and Land Development Ordinance dictates otherwise.

- (v) Total acreage of the project site and the tract of land on which the project site is located.
- (vi) A location map, for the purpose of locating the project site to be developed, at a minimum scale of 2,000 feet to the inch, showing the relation of the tract to adjoining property and to all streets and Township boundaries existing within 1,000 feet of any part of the tract of land on which the project site is proposed to be developed.
- (vii) Key map and numbering to show relationship to total number of sheets in the plan set.

(2) Existing Features

- (a) Tract boundaries showing distances, bearings and curve data, as located by field survey or by deed plotting.
- (b) Existing contours at vertical intervals of two (2) feet for land with an average natural slope of four (4) percent or less and at vertical intervals of five (5) feet for more steeply sloping land. The location of the benchmark and the datum used shall also be indicated.
- (c) The names of all owners of all immediately adjacent unplatted land, the names of all proposed or existing developments immediately adjacent, and the locations and dimensions of any streets or easements shown thereon.
- (d) The names, locations and dimensions of all existing streets, rights-of-way, railroads, watercourses, drainage facilities, floodplains, wetlands, quarry sites, historic structures, wooded areas and other significant environmental or topographic features within 200 feet of any part of the tract proposed to be developed and the location of all buildings and approximate location of all tree masses within the tract.

- (e) Soil types as designated by the USDA SCS Soil Survey of Lancaster County.
- (3) Proposed Features
- (a) The proposed land use, the number of lots and dwelling units and the extent of commercial, industrial or other non-residential uses.
 - (b) The locations and dimensions of all proposed streets, parks, playgrounds, and other public areas, sewer and water facilities; lot lines and building locations, and parking compounds and other impervious and semi-pervious surfaces.
 - (c) The proposed changes to land surface and vegetative cover including areas to be cut or filled.
 - (d) Final contours at vertical intervals of two (2) feet for land with an average natural slope of four (4) percent or less and at vertical intervals of five (5) feet for more steeply sloping land. Where existing contours are not shown or where proposed contour lines cannot be accurately located (i.e., as in a single family detached residential development when the building has not been determined), arrows sufficient to indicate general surface runoff flow patterns within each lot shall be shown.
 - (e) Easements and rights-of-way, including:
 - (i) A minimum 20 foot wide access easement around all Storm Water Management facilities that would provide ingress from and egress to a public right-of-way. Easements shall be provided to allow for the collection and discharge of water, the inspection, maintenance, repair and reconstruction of the drainage facilities, and the passage of machinery for work.
 - (ii) Provisions for permanent access or maintenance easements for all existing and proposed physical Storm Water Management facilities, such as ponds and infiltration structures, as necessary to implement the Operation and Maintenance (O&M) Plan. All such agreements

shall be duly recorded in the Office of the Recorder Deeds and shall constitute a binding permanent covenant upon the property, superior to all liens of record and not subordinate to any easement or restriction that would interfere with its provisions and the implementation thereof.

- (f) A statement identifying the number of square feet of impervious coverage for which storm water management facilities have been designed for each lot.
 - (g) A complete landscape plan showing the location, size and type of all plant material required by provisions of this Ordinance or any other applicable Township regulations, including but not limited to all vegetated storm water BMPs. The landscape plan should be provided on separate sheets and must include the signature and seal of the registered landscape architect responsible for preparation of the plan. Native or Naturalized/Non-invasive Vegetation suitable to the soil and hydrologic conditions of the development site shall be used unless otherwise specified in the BMP Manual. The limit of existing, native vegetation to remain shall be delineated on the plan along with proposed construction protection measures.
- (4) Storm Water Management Facilities
- (a) All storm sewers along with any proposed connections to existing facilities.
 - (b) If seepage pits, beds or trenches must be used, the locations of septic tank infiltration areas and wells must be shown.
 - (c) Other control devices or methods such as roof-top storage, grass swales, parking lot ponding, vegetated strips, and detention or retention basins.
 - (d) Plans and profiles of all proposed storm water management facilities including vertical and horizontal alignment, size and type of material. This information shall be of the quality required for the construction of all facilities.

- (e) When plan applications, whether preliminary or final, are submitted in sections, a generalized Storm Water Management Site Plan for the entire project site shall be submitted in addition to the detailed Storm Water Management Site Plan for the proposed section. This generalized plan shall demonstrate how the storm water of the proposed section will relate to the entire development. The amount and velocity at the discharge point of the section shall be included in the data submitted. If temporary facilities are required for construction of a section, such facilities shall be included in the submitted plans.
- (f) A note on the plan indicating any area that is not to be offered for dedication along with a statement that the Township is not responsible for maintenance of any area not dedicated for public use, and that no alteration to swales, or basins, or placement of structures shall be permitted within easements.
- (g) A certificate, signed and sealed by an individual registered in the Commonwealth of Pennsylvania and qualified under all applicable local and state laws to perform such duties, indicating the compliance of the design of the storm water management facilities with the provisions of this Ordinance. See form of certificate in Appendix 7.
- (h) A statement, signed by the landowner, acknowledging the storm water management system to be a permanent fixture that can be altered or removed only after approval of a revised Plan by the municipality or its designee.
- (i) When subsurface storage facilities such as seepage pits, beds or trenches are used, the locations of existing and proposed septic tank infiltration areas and wells must be shown. Minimum separation distances from On Lot Disposal System (OLDS) infiltration shall be provided in accordance with PA DEP rules and regulations. Infiltration rates shall be based upon perc and probe tests conducted at the site of the proposed facility.
- (j) A note indicating that an as-built plan meeting all of the requirements of Section 407 of the Upper Leacock Township Storm Water Management Ordinance must be submitted prior to final approval of the installed

improvements. Along with the required as-builts, detention basin routings that compare the as-built outflows to the design outflows must be provided prior to the final release of the financial security for all storm water management and conveyance facilities. To enable the compilation of accurate as-built drawings, the site contractors must keep accurate records of the horizontal and vertical locations of all improvements. This information, along with supplemental field surveyed information, must then be converted into as-built drawings that comply with the Township's as-built requirements. Following completion of construction, the following shall be submitted to the Township: 1) 3 copies of As-built Plans; 2) A CD with full-sized scans of As-built Plans in both .pdf (Adobe Acrobat) and .jpg formats; 3) CD with As-built Plans in both CAD and ArcGIS format is defined as appropriate shapefiles or geodatabase files being created for each data layer in the final plan. Include metadata for description of layer names and attributes fields information included with each layer. All data must be projected to PA state plane south zone, NAD 83 and NAVD 88, feet. (Lancaster County's GIS standard projection).

(5) Erosion and Sedimentation Controls

(a) The type, location and extent of all erosion and sedimentation control measures shall be shown on an erosion and sedimentation control plan that conforms to the requirements of the Erosion and Sediment Pollution Control Manual of the Pennsylvania Department of Environmental Protection.

(6) A detailed schedule of inspections during construction, generally outlined as follows, which is tailored for the site under consideration.

(a) The Township shall inspect all phases of the installation of any temporary or permanent Storm Water Management facilities during construction. The developer shall pay the cost of any such inspection. The developer shall provide at least 24 hours' notice prior to the start of construction of any improvements that are subject to inspection. All inspections of completed

items shall be requested, in writing, at least 48 hours in advance of the inspection time and date.

- (b) It is generally required that the following phases of site construction have mandatory inspection. This general list of phases may be amended by mutual agreement of the Township and developer when the site requires special construction procedures. The inspection schedule must be shown on the approved Storm Water Management Site Plan.
- (c) General Site Construction
 - (i) Upon completion of preliminary site preparation including stripping of vegetation, stockpiling of topsoil and construction of temporary erosion and sedimentation control devices.
 - (ii) Upon completion of rough grading, but prior to placing topsoil, permanent drainage, or other site development improvements and ground covers.
 - (iii) During the construction of permanent storm water management and BMP facilities.
 - (iv) Upon the final completion of permanent storm water management and BMP facilities, including the establishment of ground covers and plantings.
 - (v) After review of the as-built drawings, required by this Ordinance, but prior to final release of the financial security for completion of final grading, vegetative controls required by the BMP standards, or other site restoration work.

B. Written Report, including the following information:

- (1) All calculations, assumptions, and criteria used in the design of the storm water management facilities must be shown.
- (2) Storm water runoff calculations for both pre-development and post-development conditions.

- (3) An erosion and sedimentation control plan narrative that conforms to the requirements of the Erosion and Sediment Pollution Control Manual of the Pennsylvania Department of Environmental Protection and provides a description of all erosion and sedimentation control measures, temporary as well as permanent, including the staging of earth moving activities, sufficient in detail to clearly indicate their function.
- (4) General description of the Development Site, including a description of existing natural and hydrologic features and any environmentally sensitive areas.
- (5) General description of the overall storm water management concept for the project, including a description of permanent storm water management techniques, non-structural BMPs to be employed and construction specifications of the materials to be used for structural storm water management facilities.
- (6) For all proposed storm water management facilities, except temporary sedimentation basins, the documentation shall include a plotting or tabulation of storage volumes with corresponding water surface elevations and the outflow rates for those water surfaces.
- (7) For all proposed storm water management facilities, except temporary sediment basins, documentation shall set forth the design hydrograph, the routing method or a method of equal caliber acceptable to the Township Engineer, utilized to determine the function of the basin.
- (8) An Operation and Maintenance program, in recordable form acceptable to the Township, that clearly sets forth the Operation and Maintenance responsibility of all temporary and permanent storm water management facilities and erosion and sedimentation control facilities. The intent of these regulations is to provide private Operation and Maintenance of storm water management and erosion and sedimentation control facilities, including:
 - (a) Description of temporary and permanent maintenance requirements.

- (b) Identification of a responsible individual, corporation, association or other entity for Operation and Maintenance of both temporary and permanent storm water management and erosion and sedimentation control facilities.
 - (c) Provisions for permanent access or maintenance easements for all existing and proposed Storm Water Management Facilities, as necessary to implement the Operation and Maintenance (O&M) Plan discussed in this Ordinance. All such agreements shall be duly recorded in the Office of the Recorder of Deeds and shall constitute a binding permanent covenant upon the property, superior to all liens of record and not subordinate to any easement or restriction that would interfere with its provisions and the implementation thereof.
 - (d) The intent of these regulations is to provide private ownership and maintenance of storm water management and erosion and sedimentation control facilities. Where the Storm Water Management Site Plan proposes that the Township own or maintain the facilities, a description of the methods, procedures, and the extent to which any facilities shall be turned over to the Township shall be incorporated as an integral part of the plan.
- C. Financial security for the completion of storm water management facilities as set forth in Article V of this Ordinance.
- D. Maintenance guarantee, as set forth in Article V of this Ordinance.
- E. The Township may prescribe that the applicant shall reimburse the Township for the reasonable and necessary expense incurred for the review of Storm Water Management Site Plans and calculations. Such reimbursement shall be based upon a schedule established by ordinance or resolution. Such expense should be reasonable and in accordance with the ordinary and customary fees charged by the Township Engineer for the work performed for similar services in the community, but in no event shall the fees exceed the rate or cost charged by the engineer otherwise imposed on applicants. Should the applicant dispute the amount of any such expense, the applicant should follow the procedure set forth in Section 504.E.1-5.

- F. The fees required by this Ordinance shall at a minimum cover:
1. The review of the Storm Water Management Site Plan by the Municipality.
 2. The development site inspection.
 3. The inspection of Storm Water Management facilities and drainage improvements during construction.
 4. The final inspection upon completion of the Storm Water Management facilities and drainage improvements presented in the Storm Water Management Site Plan, and review of the As-Built Plans and calculations for compliance.
 5. Any additional work required to enforce any permit provisions regulated by this Ordinance, correct violations, and assure proper completion of stipulated remedial actions.
 6. Defray administration and clerical costs.
 7. Defray inspection and maintenance costs for facilities dedicated to and accepted by the municipality.
- G. A PA DEP permit for any storm water management facility requiring a permit to be issued by PA DEP.
- H. A Pennsylvania Department of Transportation Highway Occupancy Permit for any storm water management facility proposed within the right-of-way of a state road.

Section 405. STORM WATER MANAGEMENT SITE PLAN SUBMISSION

- A. When a Stormwater Management Site Plan is required, the applicant shall submit the following to the Municipality:
- (1) Four (4) copies to the SWM Site Plan prepared in accordance with the requirements of Article IV of this Ordinance, including all plans, reports, and correspondence with the Lancaster County Conservation District and all supporting information required in Section 404.

- (2) Two (2) copies of all supplemental data.
- (3) A filing fee (in accordance with the Municipality'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 governing body or its designee, shall be returned to the Applicant within 7 days, 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 Municipality's decision not to accept a particular application in accordance with Section 805 of this Ordinance.
- E. At its sole discretion and in accordance with this Article, when a SWM Site Plan is found to be deficient, (name of municipality) may either disapprove the submission and require a resubmission, or in the case of minor deficiencies, (name of municipality) may accept submission of revisions.

Section 406. MUNICIPAL REVIEW

- A. When the regulated activity constitutes a Subdivision or Land Development as defined in the Upper Leacock Township 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 the Upper Leacock Township Subdivision and Land Development Ordinance.

- B. When the regulated activity constitutes a Minor Land Disturbance, all complete applications for approval shall be reviewed by the Code Enforcement Officer, along with the Township Engineer, Township Solicitor, the Conservation District, and other municipal officials in order to determine approval, conditional approval, or disapproval of the application within ninety (90) days from the municipal receipt of an application.
- C. An application for a Storm Water Management Permit may be submitted to the Code Enforcement Officer on any business day. In the event that a question arises as to whether a proposed activity requires a Storm Water Management Permit, the landowner or developer may request that the Code Enforcement Officer determine whether the proposed activity constitutes a land disturbance activity as defined in Article II, and if so, whether such activity is exempted from obtaining a permit under Section 402 of this Ordinance. The landowner or developer shall furnish the Code Enforcement Officer with such information as the Code Enforcement Officer may deem necessary to determine whether the proposed activity constitutes a land disturbance activity. A decision of the Code Enforcement Officer may be appealed to the Board of Supervisors in accordance with Section 807 herein.
- D. Alternates to SWM Site Plan Processing
- (1) Where a Development Site is located within the Agricultural Zone and has an implemented conservation plan reviewed by the Conservation District, the submission of proof of the implemented conservation plan shall be considered compliance with this Ordinance for installation of impervious surface coverage where all of the following criteria are met:
- (a) For a parent tract containing not less than 10.5 acres to 20 acres, cumulative new impervious areas of 10,000 square feet or less if the minimum distance between the proposed impervious area and/or SWM Facility discharge point to the downslope property line of the parent tract is at least 100 feet.
- (b) For a parent tract containing not less than 20 acres, cumulative new impervious areas of 20,000 square feet or less if the minimum distance

between the proposed impervious area and/or SWM Facility discharge point to the downslope property line of the parent tract is at least 250 feet.

- (2) An applicant for processing under this Section shall provide the Township with information to demonstrate there shall be no disturbance of land within floodplains, wetlands, environmentally sensitive areas, riparian forest buffers, or slopes greater than 15 percent. In addition there shall be no diversion or piping of any natural or man-made water course or existing drainage pattern.
- E. The Code Enforcement Officer may review an application for a Storm Water Management Site Plan with the Township Engineer, Township Solicitor, the Lancaster County Conservation District, and other municipal officials in order to determine approval, conditional approval, or disapproval of the application within 90 days from the municipal receipt of an application. A notice of disapproval shall cite the reasons for disapproval.
- F. Approval of a Storm Water Management Site Plan by the Code Enforcement Officer shall not be construed as an indication that the plan complies with the standards of any agency of the Commonwealth.
- G. Approval of a Storm Water Management Site Plan by the Code Enforcement Officer shall be obtained by a developer prior to the construction of storm water management facilities.
- H. Revisions to a SWM Site Plan after submission but before municipal action shall require a re-submission of the modified SWM Site Plan consistent with Section 405 of this Ordinance and be subject to review as specified in Section 406 of this Ordinance. For the purposes of review deadlines, each resubmission shall constitute a new submission for the purposes of time limits as set forth in the MPC and this ordinance. Any substantial revisions to a SWM Site Plan after approval shall be submitted as a new plan to the Municipality, accompanied by the applicable Review Fee.
- I. A disapproved SWM Site Plan may be resubmitted, with the revisions addressing the municipality's concerns, to the municipality in accordance with this Article. The applicable review fee must accompany a resubmission of a disapproved SWM Site Plan.

J. Modification or Waiver of Ordinance Provisions

- (1) Application Requirements A request for a modification or waiver may be submitted to the Township at any time. All requests shall meet the requirements of Section 805, be in writing and accompanied by a plan prepared to the minimum standards of a Minor Land Disturbance Plan (See Section 403). The written request shall identify:
 - (a) The specific section of this Ordinance which is requested to be modified or waived.
 - (b) The provisions proposed as an alternate to the requirements. The alternate provisions must be equal to or better than the requirements of, and consistent with, the intents of this Ordinance and shall not be contrary to the general public interest.
- (2) Township Action
 - (a) A modification or waiver request that is submitted as part of an application for a Storm Water Management Site Plan shall be processed along with that application of which it is a part.
 - (b) If a modification or waiver request is not submitted with an application for a Storm Water Management Site Plan, then the processing procedures outlined in this Section shall apply.
- (3) The request shall state in full the grounds and facts of unreasonableness or hardship on which the request is based.
- (4) The provisions of this Ordinance not related to state water quality requirements are intended as minimum standards for the protection of the public health, safety, and welfare. The Township reserves the right to modify or waive 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

Township 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 or waivers shall be listed on the plan.

- (5) In granting waivers/modifications for provisions of this Ordinance, the Township may impose such conditions as will, in its judgment, secure substantially the objectives of the standards and requirements of this Ordinance.
- (6) The Township may, after consultation between the Applicant and PADEP, 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 Applicant shall provide the Township with a record of consultations with PADEP pursuant to this paragraph.
 - (a) Where a written Erosion and Sedimentation Control Plan associated with earth disturbance of 5,000 square feet to 1 acre is required, review of the written Erosion and Sedimentation Control Plan shall constitute satisfaction of consultation with PADEP.
 - (b) Where an NPDES permit for storm water discharges associated with construction activities is required, issuance of an NPDES permit shall constitute satisfaction of consultation with PADEP.
- (7) After discussion of the request by the Planning Commission, the request will be acted upon by The Board of Supervisors, which shall render its decision and communicate it to the Applicant not later than ninety (90) days following the date the completed application is filed.

Section 407 AS-BUILT PLANS

- A. Upon completion of all required improvements and prior to final inspections of improvements, the developer shall submit a Plan labeled “As-Built Plan,” showing the location, dimension, and elevation of all improvements. In addition, the plan shall indicate that the resultant grading, drainage structures, and/or drainage systems and erosion and sediment control practices, including vegetative measures, are in substantial conformance with the previously approved drawings and specifications. The plan shall note all deviation from the previously approved drawings.
- B. The following includes, but is not limited to, the items required as part of an as-built plan.
- (1) Actual location of floodplain by elevation and dimension from property line.
 - (2) Actual location and cross section of swales and accompanying easements.
 - (3) Actual horizontal and vertical location of storm water management facilities including associated easements; invert/grate elevations of inlets; and slope, material type, and diameter of storm drainage pipes.
 - (4) Actual location of the storm water management facilities including:
 - (a) Actual contours of the storm water management facility.
 - (b) Actual outlet structure details including type, size, and inverts of outlet pipes.
 - (c) Actual elevation and dimensions of the embankment and emergency spillway.
 - (d) A table showing the stage/storage/discharge curve for the constructed conditions.
 - (e) A table providing a comparison of the approved design vs. the as-built discharge rates from all storm water management facilities.

- (5) Two (2) copies of the plan (one paper transparency and one mylar) shall be submitted to the Township, who shall distribute the paper transparency to the Township Engineer and retain the plastic transparency for the Township files.
- C. 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).
- D. The As-Built Record Plan submission shall include a certification of completion signed by the Owner's qualified professional verifying that all permanent Storm Water Management BMPs have been constructed according to the approved plans and specifications. If any qualified licensed professionals contributed to the construction plans, then a qualified licensed professional must sign the completion certificate.
- E. Along with the required as-builts, detention basin routings that compare the as-built outflows to the design outflows must be provided prior to the final release of the financial security for all storm water management and conveyance facilities. To enable the compilation of accurate as-built drawings, the site contractors must keep accurate records of the horizontal and vertical locations of all improvements. Additional As-Built information, as deemed necessary by the Township Engineer, shall also be noted on the plan. This information, along with supplemental field surveyed information, must then be converted into as-built drawings that comply with the Township's as-built requirements. Following completion of construction, the following shall be submitted to the Township: 1) 3 copies of As-built Plans; 2) A CD with full-sized scans of As-built Plans in both .pdf (Adobe Acrobat) and .jpg formats; 3) CD with As-built Plans in both CAD and ArcGIS format is defined as appropriate shapefiles or geodatabase files being created for each data layer in the final plan. Include metadata for description of layer names and attributes fields information included with each layer. All data must be projected to PA state plane south zone, NAD 83 and NAVD 88, feet. (Lancaster County's GIS standard projection).

ARTICLE V. COMPLETION OF FACILITIES OR GUARANTEE THEREOF

Storm water management facilities shall be completely installed prior to final plan approval unless the developer submits proper financial security with the final plan application in accordance with the Township Subdivision and Land Development Ordinance and in accordance with the provisions of Sections 509, 510, and 511 of the Pennsylvania Municipalities Planning Code.

Section 501. DETERMINATION OF FINANCIAL SECURITY

- A. Where required, the developer shall file with the Board of Supervisors financial security in an amount sufficient to cover the costs of all storm water management facilities required by this Ordinance. When requested by the developer, in order to facilitate financing, the Board of Supervisors or the Planning Commission, if designated, shall furnish the developer with a signed copy of a resolution indicating approval of the final storm water management plat contingent upon the developer obtaining a satisfactory financial security. The final plat or record plan shall be neither signed nor recorded until the financial improvements agreement is executed. The resolution or letter of contingent approval shall expire and be deemed to be revoked if the financial security agreement is not executed within 90 days unless a written extension is granted by the Board of Supervisors; such extension shall not be unreasonably withheld and shall be placed in writing at the request of the developer.

- B. Without limitation as to other types of financial security which the Township may approve, which approval shall not be unreasonably withheld, federal or Commonwealth chartered lending institution irrevocable letters of credit and restrictive or escrow accounts in such lending institutions shall be deemed acceptable financial security. Such financial security shall be posted with a bonding company or federal or Commonwealth chartered lending institution chosen by the developer provided said bonding company or lending institution is authorized to conduct such business within the Commonwealth. Such bond, or other security shall provide for, and secure to the public, completion of all storm water management facilities within one (1) year of the date fixed on the finally approved plan for the completion of such facilities.

- C. The amount of financial security to be posted for the completion of the improvements shall be equal to 110 percent of the cost of completion estimated as of 90 days following the date scheduled for completion by the developer. Annually, the Township may adjust the amount of the financial security by comparing the actual cost of the improvements which have been completed and the estimated cost for the completion of the remaining improvements as of the expiration of the 90th day after either the original date scheduled for completion or a rescheduled date of completion. Subsequent to said adjustment, the Township may require the developer to post additional security in order to assure that the financial security equals 110 percent. Any additional security shall be posted by the developer in accordance with this section.

- D. The amount of financial security required shall be based upon an estimate of the cost of completion of the required improvements, submitted by an applicant or developer and prepared by a professional engineer licensed as such in this Commonwealth and certified by such engineer to be a fair and reasonable estimates of such cost. The Township, upon the recommendation of the Township Engineer, may refuse to accept such estimate for good cause shown. If the applicant or developer and Township are unable to agree upon an estimate, then the estimates shall be recalculated and recertified by another professional engineer licensed as such in this Commonwealth and chosen mutually by the Township and the applicant or developer. The estimate certified by the third engineer shall be presumed fair and reasonable and shall be the final estimate. In the event that a third engineer is so chosen, fees for the services of said engineer shall be paid equally by the Township and the applicant or developer.

- E. If the developer requires more than one (1) year from the date of posting of the financial security to complete the required improvements, the amount of financial security may be increased by an additional ten (10) percent for each one (1) year period beyond the first anniversary date from posting of financial security or to an amount not exceeding 110 percent of the cost of completing the required improvements as reestablished on or about the expiration of the preceding one (1) year period by using the above procedures.

- F. In the case where development is projected over a period of years, the Board of Supervisors may authorize submission of Storm Water Management Site Plan applications by section or stages of development subject to such necessary requirements or guarantees by the applicant to ensure protection of storm water management facilities in future sections or stages of development as it finds essential for the protection of any finally approved section of the development.

- G. If financial security has been provided in lieu of the completion of improvements required as a condition for the final approval of a plat as set forth in the Ordinance, the Township shall not condition the issuance of building, grading, or other permits relating to the erection or placement of improvements, including buildings, upon the lots or land as depicted upon the final plat upon actual completion of the improvements depicted upon the approved final plat. Moreover, if said financial security has been provided, occupancy permits for any building or buildings to be erected shall not be withheld following: the improvement of the streets providing access to and from existing public roads to such building or buildings to a permanently passable condition, as well as the completion of all other improvements as depicted upon the approved plat, either upon the lot or lots or beyond the lot or lots in question if such improvements are necessary for the reasonable use of or occupancy of the building or buildings.

Section 502. RELEASE OF FINANCIAL SECURITY

- A. As the work of installing the required storm water management facilities proceeds, the developer may request the Township 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 Township who shall have 45 days from receipt of such request within which to allow the Township Engineer to certify, in writing, to the Township that such portion of the work upon the facilities has been completed in accordance with the approved plan. Upon such certification, the Township shall authorize release by the bonding company or lending institution of an amount as estimated by the Township Engineer fairly representing the value of the facilities completed or, if the Township fails to act within said 45 day period,

the Township shall be deemed to have approved the release of funds as requested. The Township may, prior to final release at the time of completion and certification by the Township Engineer, require retention of ten (10) percent of the estimated cost of the aforesaid facilities.

- B. For Storm Water Management Site Plans that are required to have an NPDES permit and a financial guarantee to the Municipality is required, evidence of the NPDES permit's executed "Notice of Termination" shall be provided to the Municipality prior to release of the financial security.

Section 503. SCHEDULE OF INSPECTIONS

- A. The Municipality, in conformance with Section 803, shall inspect all phases of the installation of any temporary or permanent Storm Water Management facilities.
- B. During the construction of the development, the Township Engineer or other authorized Township official may inspect the premises to determine that the work is progressing in compliance with the information provided on the approved Storm Water Management Site Plan and with all applicable Township laws and ordinances.
- C. The cost for the conducting of inspections by the Township Engineer or other authorized Township official shall be borne by the developer in accordance with the inspection fee adopted by the resolution of the Board of Supervisors.
- D. In the event the Township Engineer or authorized official discovers that the work does not comply with the approved plan or any applicable laws and ordinances, the Township shall suspend any existing permits related to the development until the required corrections have been made. Any portion of the work which does not comply with the approved plan must be corrected by the developer within ten (10) days. No work may proceed on any subsequent phase of the Storm Water Management Site Plan, the subdivision or land development, or building construction, until the related permits have been reinstated.
- E. If at any stage of the work, the Township Engineer or authorized official determines that the soil or other conditions are not as stated or shown in the approved application, or that there

has been a false statement or misrepresentation by the developer, the Township Engineer or authorized official may refuse to approve further work and the Township may revoke existing permits until a revised plan is submitted and approved, as required by Section 607 of this Ordinance.

Section 504. FINAL INSPECTION

- A. When the developer has completed all the required facilities, he shall notify the Township in writing by certified or registered mail, and shall send a copy of such notice to the Township Engineer. The Board of Supervisors shall, within ten (10) days after receipt of such notice, authorize the Township Engineer to inspect the required facilities. The Township Engineer shall promptly file a report, in writing, with the Township and shall mail a copy of the report to the developer by certified or registered mail. The report shall be made and mailed within 30 days after receipt by the Township Engineer of the aforesaid authorization by the Township.
- B. Based on the report of the Township Engineer, the Township shall indicate approval or rejection of the storm water management facilities, either in whole or in part; and if not approved, state reasons for the rejection. The Township shall notify the developer within 15 days of receipt of the engineer's report, in writing by certified or registered mail, of its actions.
- C. If the Board of Supervisors or the Township Engineer fails to comply with the time limitation provisions contained herein, all storm water management facilities will be deemed to have been approved, and the developer shall be released from all liability, pursuant to its performance guarantee bond, or other security agreement.
- D. If any portion of said improvements are not approved or are rejected by the Township, the developer shall proceed to complete the same and, upon completion, the same procedure of notification outlined herein shall be followed.
- E. The Township may prescribe that the applicant shall reimburse the Township for the reasonable and necessary expense incurred for the inspection of improvements. Such reimbursement shall be based upon a schedule established by ordinance or resolution. Such

expense should be reasonable and in accordance with the ordinary and customary fees charged by the Township Engineer for the work performed for similar services in the community, but in no event shall the fees exceed the rate or cost charged by the engineer otherwise imposed on applicants.

- (1) In the event the applicant disputes the amount of any such expense in connection with the inspection of improvements, the applicant shall, within ten (10) working days of the date of billing, notify the Township that such expenses are disputed as unreasonable or unnecessary, in which case the Township shall not delay or disapprove a subdivision or land development application or any approval or permit related to development due to the applicant's request over disputed engineer expenses.
- (2) If, within 20 days from the date of billing, the Township and the applicant cannot agree on the amount of expenses which are reasonable and necessary, then the applicant and the Township shall jointly, by mutual agreement, appoint another professional engineer licensed as such in the Commonwealth of Pennsylvania to review the said expenses and make a determination as to the amount thereof which is reasonable and necessary.
- (3) The professional engineer so appointed shall hear such evidence and review such documentation as the professional engineer in his or her sole opinion deems necessary and render a decision within 50 days of the billing date. The applicant shall be required to pay the entire amount determined in the decision immediately.
- (4) In the event that the Township and applicant cannot agree upon the professional engineer to be appointed within 20 days of the billing date, then, upon application of either party, the President Judge of the Court of Common Pleas of the judicial district in which the municipality is located (or if at the time there be no President Judge, then the senior active judge then sitting) shall appoint such engineer, who, in that case, shall be neither the Township Engineer nor any professional engineer who has been retained by, or performed services for, the Township or the applicant within the preceding five (5) years.

- (5) The fee of the appointed professional engineer for determining the reasonable and necessary expenses shall be paid by the applicant if the amount of payment required in the decision is equal to or greater than the original bill. If the amount of payment required in the decision is less than the original bill by \$1,000 or more, the Township shall pay the fee of the professional engineer, but otherwise the Township and the applicant shall each pay one-half of the fee of the appointed professional engineer.

Section 505. REMEDIES TO EFFECT COMPLETION OF FACILITIES

In the event any storm water management facilities which may be required have not been installed as provided in this Ordinance or in accordance with the approved final plan, the Board of Supervisors has 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 facilities covered by said security, the Board of Supervisors may, at its option, install part of such facilities in all or part of the development and may institute appropriate legal or equitable action to recover the monies necessary to complete the remainder of the facilities. All of the proceeds, whether resulting from the security or from any legal or equitable action brought against the developer, or both, shall be used solely for the installation of the storm water management facilities covered by such security, and not for any other purpose.

Section 506. AUTHORIZATION TO CONSTRUCT AND TERM OF VALIDITY

The municipality's approval of a Storm Water Management Site Plan authorizes the regulated activities contained in the Storm Water Management Site Plan for a maximum term of validity of five (5) years following the date of approval. The municipality may specify a term of validity shorter than five (5) years in the approval for any specific Storm Water Management Site Plan. Terms of validity shall commence on the date the municipality signs the approval for a Storm Water Management Site Plan. If a approved Storm Water Management Site Plan is not completed according to Section 404 within the term of validity, then the municipality may consider the Storm Water Management Site Plan disapproved and may revoke any and all permits. Storm Water Management Site Plans that are considered disapproved by the municipality shall be resubmitted in accordance with Section 404 of this Ordinance.

ARTICLE VI. MAINTENANCE OF STORM WATER MANAGEMENT FACILITIES

The municipality shall make the final determination on the continuing maintenance responsibilities prior to final approval of the Storm Water Management Site Plan. The municipality may require a dedication of such facilities as part of the requirements for approval of the Storm Water Management Site Plan. Such a requirement is not an indication that the municipality will accept the facilities. The municipality reserves the right to accept or reject the ownership and operating responsibility for any portion of the Storm Water Management controls.

Section 601. MAINTENANCE OF FACILITIES DURING DEVELOPMENT

Maintenance of storm water management facilities during development of a project site shall be the responsibility of the developer and the landowner and shall include but not be limited to:

- A. Removal of silt from all debris basins, traps or other structures or measures when 60 percent of the capacity is filled with silt; provided, however, that in no case shall the sediment level be permitted to build up higher than one (1) foot below the principal outlet crest. At this elevation, clean out shall be performed to restore the original design volume to the basin or other structure. The elevation corresponding to the maximum allowable sediment level shall be determined and stated in the design data as a distance below the top of the riser. The elevation shall be clearly marked on the riser to enable proper maintenance.
- B. Periodic maintenance of temporary control facilities, such as replacement of straw bale dikes, straw filters or similar measures.
- C. Establishment or re-establishment of vegetation by seeding and mulching or sodding of scoured areas or area where vegetation has not successfully been established.
- D. Installation of necessary controls to correct unforeseen problems caused by storm events within design frequencies.

- E. Removal of all temporary storm water management control facilities upon installation of permanent storm water management facilities at the completion of the development.

Section 602. MAINTENANCE OF FACILITIES AFTER DEVELOPMENT

It is the purpose and intent of this Ordinance that the Township shall not become responsible for maintenance and supervision of storm water management facilities unless such facilities are within rights-of-way dedicated to and accepted by the Township or unless such facilities are specifically accepted by the Township. The plan shall reflect and/or be accompanied by supporting documentation identifying the ownership of and the responsibility to maintain all storm water management facilities. The responsibility for storm water management facility maintenance falls upon the developer of the project site who shall remain responsible for those areas of the project site which are subject to the requirements of this Ordinance. This responsibility may be retained or assigned to third persons as is deemed most acceptable to the developer.

Section 603. MAINTENANCE OF FACILITIES ACCEPTED BY THE TOWNSHIP

Where the Board of Supervisors accepts dedication for all or some of the required storm water management facilities following completion, the Board of Supervisors shall require the posting of financial security to secure structural integrity of said facilities as well as the functioning of said facilities in accordance with the design and specifications as depicted on the approved Storm Water Management Site Plan for a term not to exceed 18 months from the date of acceptance of dedication. Said financial security shall be the same type as required in Section 501 with regard to installation of such facilities, and the amount of the financial security shall not exceed 15 percent of the actual cost of installation of said facilities.

Section 604. MAINTENANCE OF FACILITIES NOT ACCEPTED BY TOWNSHIP

- A. It is the intent of this Ordinance that the purposes of this Ordinance shall be carried out through the exercise of responsibility of private parties, and therefore, it is anticipated that Storm Water Management Site Plans shall be designed with a view towards facilities which can effectively be contained within the tracts to be owned and maintained by private

parties. To foster this purpose, with respect to storm water management facilities on a project site as shown on a plan of a developer, which storm water management facilities will not otherwise become part of Township property, such facilities shall become the responsibility of the individual property owners on whose properties such storm water management facilities lie, including but not limited to retention ponds, detention ponds, sediment basins, BMPs, energy dissipaters, pipes, or grassed waterways.

B. The Township and developer shall enter into an agreement, as presented in Appendix 10 of this Ordinance, which shall be recorded, setting forth such maintenance responsibilities.

(1) The Landowner, successor and assigns shall maintain all facilities in good working order in accordance with the approved maintenance schedule and shall keep all facilities in a safe and attractive manner.

(2) The Landowner shall convey to the Township conservation easements and/or rights-of-way to assure access for periodic inspections by the Township and maintenance, if required.

(3) The owner shall keep on file with the Township 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 Township within ten (10) days of the change.

C. Persons, including developers, conveying property within a project site to another party, which property contains any storm water management facilities, shall include a specific deed reference to such grantee's responsibility for the maintenance and care of the storm water management facilities as are included within such grantee's property. The deed reference to such storm water management facilities shall be in the form of a deed restriction imposing responsibilities upon said property owner for the maintenance of the portions of the storm water management facilities within the boundary lines of said property as may be necessary for proper maintenance of the storm water management facilities in accordance with the terms of this Ordinance or it may impose such responsibilities upon a private entity in accordance with the requirements of Section 605. Such maintenance shall include, at a minimum, the following:

- (1) Regular inspection of the Storm Water Management facilities to assure proper implementation of BMPS, maintenance and care, as per Section 803.
- (2) All pipes, swales and detention facilities shall be kept free of any debris or other obstruction and in original design condition.
- (3) Removal of silt from all permanent structures which trap silt or sediment in order to keep the material from building up in storm water management facilities and thus reducing their capacity to convey or store water.
- (4) Mowing grass areas as necessary to maintain adequate growth and to control weeds. Chemical weed control may be used to maintain the specified planting (i.e. grass, wetlands plants, etc.) if federal, state and local laws and regulations are met.
- (5) Liming and fertilizing vegetated channels and other areas according to the specifications in the PADEP Erosion and Sediment Pollution Control Manual.
- (6) Re-establishment of vegetation by seeding and mulching or sodding of scoured areas or areas where vegetation has not been successfully established. Selection of seed mixtures shall be subject to approval by the Township.
- (7) Where the NPDES permit for the project requires that BMPs be installed, annual written reporting of the inspection and maintenance of those BMPs shall be provided to the Township. LID Practices shall be included in the annual written report. A form for reporting shall be available at the Township office. Failure to provide such reports may result in enforcement and penalties by the Township.

D. The deed restrictions hereinabove mentioned shall also include notice that, in the event that the individual property owner should fail to comply with the terms of this Ordinance for the maintenance and care of the land in question, the Township shall have the authority to carry out those duties hereby imposed upon individual property owners. The Township may, after giving notice to an individual property owner that he is not properly maintaining the areas subject to this Ordinance and by making a demand that such compliance shall be made within the time period set forth in the notification, enter upon said property and take such actions as may be required to bring the area into compliance with this Ordinance. The Township shall further have the right to file a municipal lien against such property for the

cost of maintenance work carried out under this section, plus a penalty of ten (10) percent of the costs of such work. The Township shall, in addition to the filing of a municipal lien, have any other remedies provided by law against any property owner who should fail to comply with the terms of this Ordinance.

- E. For Storm Water Management Site Plans that are required to have an NPDES permit and a financial guarantee to the Municipality is required, evidence of the NPDES permit's executed "Notice of Termination" shall be provided to the Municipality prior to release of the financial security.
- F. Municipalities are exempt from the requirement to sign and record an O&M agreement.
- G. Where the NPDES permit for the project requires that BMPs be installed, annual written reporting of the inspection and maintenance of those BMPs shall be included in the program.
- H. Where drainage facilities are approved within a State Highway, a perpetual agreement or bond shall be required of the developer for maintenance of said facilities.

Section 605. MAINTENANCE OF FACILITIES BY PRIVATE ENTITY

In cases where permanent storm water management facilities are to be owned by a private entity such as a homeowner's association or a condominium unit owner's association, such entity shall be responsible for maintenance of the facilities. In such a case, a legally-binding agreement between the entity and the Township shall be made providing for maintenance of all permanent storm water management facilities and the Township's rights, in accordance with Section 705 of the Pennsylvania Municipal Planning Code, relating to the maintenance of storm water management facilities should the private entity fail to adequately maintain the storm water management facilities.

Section 606. MAINTENANCE OF EXISTING FACILITIES

Storm water management facilities existing on the effective date of this Ordinance on individual lots which have not been accepted by the Township or for which maintenance responsibility has not been assumed by a private entity such as homeowners' association shall be maintained by the individual property owners. Such maintenance shall include at a minimum those items set forth in Section 604.B above. If the Township determines at any time that any permanent storm water management facility has been eliminated, altered, blocked through the erection of structures or the deposit of materials or improperly maintained, the Township may determine that such condition constitutes a nuisance and shall notify the property owner of corrective measures which 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 property owner does not take the required corrective action, the Township may either perform the work or contract for the performance of the work and bill the property owner for the cost of the work, plus a penalty of ten (10) percent of the cost of the work. If such bill is not paid by the property owner within 30 days, the Township may file a municipal claim against the property upon which the work was performed in accordance with applicable laws.

Section 607. ALTERATION OF FACILITIES

No person shall modify, remove, fill, landscape or alter storm water management facilities which may have been installed on a property unless a Storm Water Management Site Plan has been approved which authorizes such modification, removal, filling, landscaping or alteration. No person shall place any structure, fill, landscaping or vegetation into a storm water management facility or within a drainage easement which will limit or alter the functioning of the facility or easement in any manner.

ARTICLE VII. PROHIBITIONS

Section 701. PROHIBITED DISCHARGES AND CONNECTIONS

- A. The following connections are prohibited, except as provided in Section 701.C.
- (1) Any drain or conveyance, whether on the surface or subsurface, that allows any non-storm water discharge including sewage, process wastewater, and wash water to enter a storm sewer system, or waters of this Commonwealth, and any connections to the storm sewer system from indoor drains and sinks; and
 - (2) Any drain or conveyance connected from a commercial or industrial land use to the storm sewer system which has not been documented in plans, maps, or equivalent records, and approved by the Township.
- B. No person shall allow, or cause to allow, discharges into surface waters of this Commonwealth which are not composed entirely of storm water, except (1) as provided in Section 701.C and (2) discharges allowed under a state or federal permit.

C. The following discharges are authorized unless they are determined to be significant contributors to pollution to the waters of this Commonwealth:

- Discharges from firefighting activities	- Flows from riparian habitats and wetlands, diverted streamflows
- Potable water sources including water line flushing	- Uncontaminated water from foundations or from footing drains
- Irrigation and Landscape irrigation drainage	- Lawn watering
- Air conditioning condensate	- Dechlorinated swimming pool discharges
- Springs	- Uncontaminated pumped groundwater, rising groundwater, and groundwater infiltration
- Water from crawl space pumps	- Water from individual residential car washing
- 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	- Routine external building wash down (which does not use detergents or other compounds)

D. In the event that the municipality or DEP determines that any of the discharges identified in Section 701.C significantly contribute to pollution of the waters of this Commonwealth, the municipality or DEP will notify the responsible person(s) to cease the discharge.

Section 702. ROOF DRAINS AND SUMP PUMPS

Roof drains and sump pumps shall discharge, to the maximum extent practicable, to infiltration or vegetative BMPs.

Section 703. ALTERATION OF STORM WATER MANAGEMENT BMPS

No person shall modify, remove, fill, landscape, or alter any Storm Water Management BMPs, facilities, areas, or structures without the written approval of the municipality.

ARTICLE VIII. ADMINISTRATION & ENFORCEMENT

Section 801. RIGHT OF ENTRY ONTO PRIVATE PROPERTY

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

Section 802. RECORDATION OF THE O&M PLAN AND AGREEMENT

The O&M Plan and Storm Water Management Agreement and Declaration of Easement shall be recorded as restrictive deed covenants that run with the land.

Section 803. REVISIONS/ALTERATIONS OF STORM WATER FACILITIES

A modification which involves a change in storm water management control methods or techniques, or which involves the relocation or redesign of control measures, or which is necessary because soil or other conditions are not as stated on the approved plan, shall require a resubmission by the developer in accordance with the plan requirements as set forth in Article IV of this Ordinance.

Section 804. INSPECTIONS

- A. Storm Water Management BMPs shall be inspected by the landowner, or the owner's designee, according to the following list of 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 (equating to at least 4.5 inches of rainfall in a 24-hour period).
- B. Inspections regarding compliance with the Storm Water Management Site Plan are a responsibility of the municipality.

Section 805. MODIFICATION OF STANDARDS

- A. The provisions of this Ordinance are intended as the minimum standards for the protection of the public health, safety, and welfare. For standards or provisions of this Ordinance not related to water quality, the Board of Supervisors may grant a waiver from literal compliance with mandatory provisions of this Chapter or a modification of the standards of this Ordinance if applicant can demonstrate either (1) that compliance would cause undue hardship as it applies to a particular property, or (2) that an alternative proposal will allow for equal or better results.

- B. If any mandatory provision of this Ordinance not related to water quality is shown by the applicant, to the satisfaction of the Board of Supervisors at a scheduled public meeting, to be unreasonable and to cause unique and undue hardship as it applies to his proposed Storm Water Management Site Plan, or provides an alternative proposal that allows for equal or better results, the Board of Supervisors, upon obtaining the comments and recommendations of the Planning Commission, may grant a modification in writing to such applicant for such mandatory provision, so that substantial justice may be done and the public interest secured; provided that such modification will not have the effect of nullifying the intent and purpose of this Ordinance.

- C. In granting modifications for standards or provisions of this Ordinance not related to water quality, the Board of Supervisors may impose conditions that will, in its judgment, secure substantially the objectives of the standards and requirements of this Ordinance.

- D. All requests for a modification for standards or provisions of this Ordinance not related to water quality shall be processed in accordance with the following:
 - (1) A request for a waiver or appeal shall be submitted at the Township Municipal Building on any business day. The request shall be made in writing and identify (1) the specific section of the Ordinance which is requested to be waived or modified; (2) the proposed alternative to the requirement, when applicable; and (3) justifications for an approval of the waiver or modification.

- (2) The Applicant shall provide the Township with copies of the request for waiver and the most current plan at least five (5) business days before the plan is scheduled to be reviewed by the Planning Commission.
 - (3) The Township shall (1) schedule the request for consideration by the Board of Supervisors at a public meeting within 60 days of receipt and (2) provide adequate notice to the applicant and any other involved parties of the meeting at which consideration of the request is scheduled.
 - (4) The Board of Supervisors shall, following the consideration of the request and recommendation by the Planning Commission, take such public action as it shall deem advisable and notify all involved parties within 20 days of the action. Such notice shall cite the findings and reasons for the deposition of the waiver application.
- E. Any person aggrieved by the action of the Board of Supervisors concerning an application for a waiver or modification of the standards of this Ordinance not related to water quality may file an appeal to the Lancaster County Court of Common Pleas in accordance with the provisions of the Local Agency Law, 2 Pa. C.S. §751 et seq.
- F. The municipality 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 municipality shall maintain a record of consultations with DEP pursuant to this paragraph. Where an NPDES permit for storm water discharges associated with construction activities is required, issuance of an NPDES permit shall constitute satisfaction of consultation with DEP.
- G. Where a written Erosion and Sediment Control Plan associated with earth disturbance of 5,000 square feet to one (1) acre is required, review of the written Erosion and Sediment Control Plan shall constitute satisfaction of consultation with DEP.

Section 806. VIOLATIONS

- A. The Board of Supervisors is hereby authorized and directed to enforce all of the provisions of this Ordinance. All inspections regarding compliance with the Storm Water Management Site Plan shall be the responsibility of the Township Engineer or other qualified persons designated by the Township.
- (1) It shall be unlawful for any person, firm, or corporation to undertake any activity under Section 105 on any property except as provided for in the approved Storm Water Management Site Plan and pursuant to the requirements of this Ordinance.
 - (2) It shall be unlawful to alter or remove any control structure required by the Storm Water Management Site Plan pursuant to this Ordinance or to allow the property to remain in a condition which does not conform to the approved Storm Water Management Site Plan.
- B. It shall be a violation of this Ordinance to commit or permit any other person to commit any of the following acts:
- (1) To commence land disturbance activities for which this Ordinance requires a permit prior to obtaining a permit or in violation of the terms or conditions of any permit issued under this Ordinance.
 - (2) To install, repair, modify, or alter storm water management facilities prior to obtaining a permit under this Ordinance or in a manner which violates the terms and conditions of any permit issued under this Ordinance.
 - (3) To misuse or fail to maintain any storm water management facility installed upon a property.
 - (4) To construct any improvements upon, grade, fill, or take any other action which will impair the proper functioning of any storm water management facility.

- (5) To place false information on or omit relevant information from an application for a waiver, approval, or permit under this Ordinance.
- (6) To fail to comply with any other provisions of this Ordinance.

Section 807. PENALTIES AND REMEDIES

- A. For each violation of the provisions of this Ordinance, the owner, agent, lessee, or contractor or any other person who commits, takes part in, or assists in any such violation shall be liable upon conviction thereof in a summary proceeding to pay a fine of not less than \$100.00 nor more than \$1,000.00 for each offense, together with the costs of prosecution. Each day or portion thereof in which a violation exists shall be considered a separate violation of this Ordinance, and each Section of this Ordinance which is violated shall be considered a separate violation.

The Board of Supervisors may, by resolution, appoint a code enforcement officer to enforce this ordinance and may authorize such code enforcement officer to institute summary criminal proceedings without prior action by the board of Supervisors.

- B. The Township may institute suits in equity to restrain, prevent, or abate any violation of this Ordinance. The Township, if required to abate nuisance conditions, shall be entitled to recover its expenses from any financial security posted by a developer, by filing a municipal claim against the property in the amount of the cost of the abatement plus a penalty of 25 percent of such costs, or by other means authorized by law.
- C. Any approval or permit issued by the municipality pursuant to this Ordinance may be suspended or revoked for:
 - (1) Non-compliance with or failure to implement any provision of the approved Storm Water Management Site Plan or O&M Agreement.
 - (2) A violation of any provision 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 the regulated activity which constitutes or creates a hazard, nuisance, pollution, or endangers the life or property of others.
- D. A suspended approval may be reinstated by the municipality when:
 - (1) The municipality has inspected and approved the corrections to the violations that caused the suspension.
 - (2) The municipality is satisfied that the violation has been corrected.
- E. An approval that has been revoked by the municipality cannot be reinstated. The applicant may apply for a new approval under the provisions of this Ordinance.
- F. If a violation causes no immediate danger to life, public health, or property, at its sole discretion, the municipality may provide a limited time period for the owner to correct the violation. In these cases, the municipality will provide the owner, or the owner's designee, with a written notice of the violation and the time period allowed for the owner to correct the violation. If the owner does not correct the violation within the allowed time period, the municipality may revoke or suspend any, or all, applicable approvals and permits pertaining to any provision of this Ordinance.

Section 808. APPEALS

- A. Any person aggrieved by an administrative decision of the Board of Supervisors may file an appeal to the Lancaster County Court of Common Pleas in accordance with the provisions of the Local Agency Law, 2 Pa. C.S. §751 et seq.
- B. Any person, partnership, corporation or organization aggrieved by any action of the Board of Supervisors may appeal to Lancaster County Court of Common Pleas within 30 days of that action.

Section 809. REPEALER

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 Board of Supervisors, this Ordinance shall be considered a restatement and not a repeal of such regulations. It is the specific intent of the Board of Supervisors that all provisions of this Ordinance shall be considered in full force and effect as of the date the regulation was initially enacted.

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 storm water regulation or ordinance of the Township, prosecution may be initiated against the alleged offender pursuant to the provisions of said prior storm water regulation or ordinance, and the provisions and penalties provided in said prior storm water regulation or ordinance shall remain effective as to said violation.

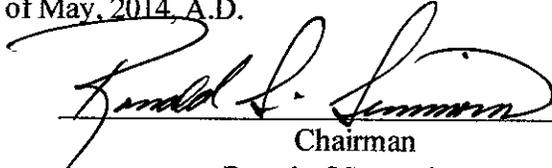
Section 810. SEVERABILITY

In the event any provision, section, sentence, clause, or part of this Ordinance shall be held to be invalid, illegal, or unconstitutional by a court of competent jurisdiction, such invalidity, illegality, or unconstitutionality shall not affect or impair the remaining provisions, sections, sentences, clauses, or parts of this Ordinance, it being the intent of the Board of Supervisors that the remainder of the Ordinance shall be and shall remain in full force and effect.

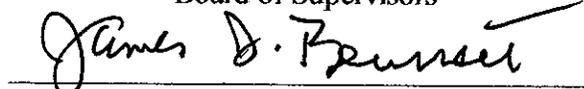
Section 811. EFFECTIVE DATE

This Ordinance shall become effective five (5) days after its adoption by the Board of Supervisors of Upper Leacock Township, Lancaster County, Pennsylvania.

ENACTED AND ORDAINED this 1st day of May, 2014, A.D.


Chairman

Board of Supervisors


Supervisor


Supervisor

ATTEST:


Secretary

APPENDIX NO. 1
Runoff Coefficients "C" for Rational Formula

Runoff Coefficients "C" for Rational Formula												
Soil Group Slope	A			B			C			D		
	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	0.14	0.23	0.34	0.21	0.32	0.41	0.27	0.37	0.48	0.34	0.45	0.56
summer conditions	0.10	0.16	0.22	0.14	0.20	0.28	0.19	0.26	0.33	0.23	0.39	0.38
Fallow Fields												
poor conditions	0.12	0.19	0.28	0.17	0.25	0.34	0.23	0.33	0.40	0.27	0.35	0.45
good conditions	0.08	0.13	0.16	0.11	0.15	0.21	0.14	0.19	0.26	0.18	0.23	0.31
Forest/Woodland	0.08	0.11	0.14	0.10	0.14	0.18	0.12	0.16	0.20	0.15	0.20	0.25
Grass Areas												
good conditions	0.10	0.16	0.20	0.14	0.19	0.26	0.18	0.22	0.30	0.21	0.25	0.35
average conditions	0.12	0.18	0.22	0.16	0.21	0.28	0.20	0.25	0.34	0.24	0.29	0.41
poor conditions	0.14	0.21	0.30	0.18	0.28	0.37	0.25	0.35	0.44	0.30	0.40	0.50
Impervious Areas	0.90	0.91	0.92	0.91	0.92	0.93	0.92	0.93	0.94	0.93	0.94	0.95
Weighted Residential												
lot size 1/8 acre	0.29	0.33	0.36	0.31	0.35	0.40	0.34	0.38	0.44	0.36	0.41	0.48
lot size 1/4 acre	0.26	0.30	0.34	0.29	0.33	0.38	0.32	0.36	0.42	0.34	0.38	0.46
lot size 1/3 acre	0.24	0.28	0.31	0.26	0.32	0.35	0.29	0.35	0.40	0.32	0.36	0.45
lot size 1/2 acre	0.21	0.25	0.28	0.24	0.27	0.32	0.27	0.31	0.37	0.30	0.34	0.43
lot size 1 acre	0.18	0.23	0.26	0.21	0.24	0.30	0.24	0.29	0.36	0.28	0.32	0.41

APPENDIX NO. 2

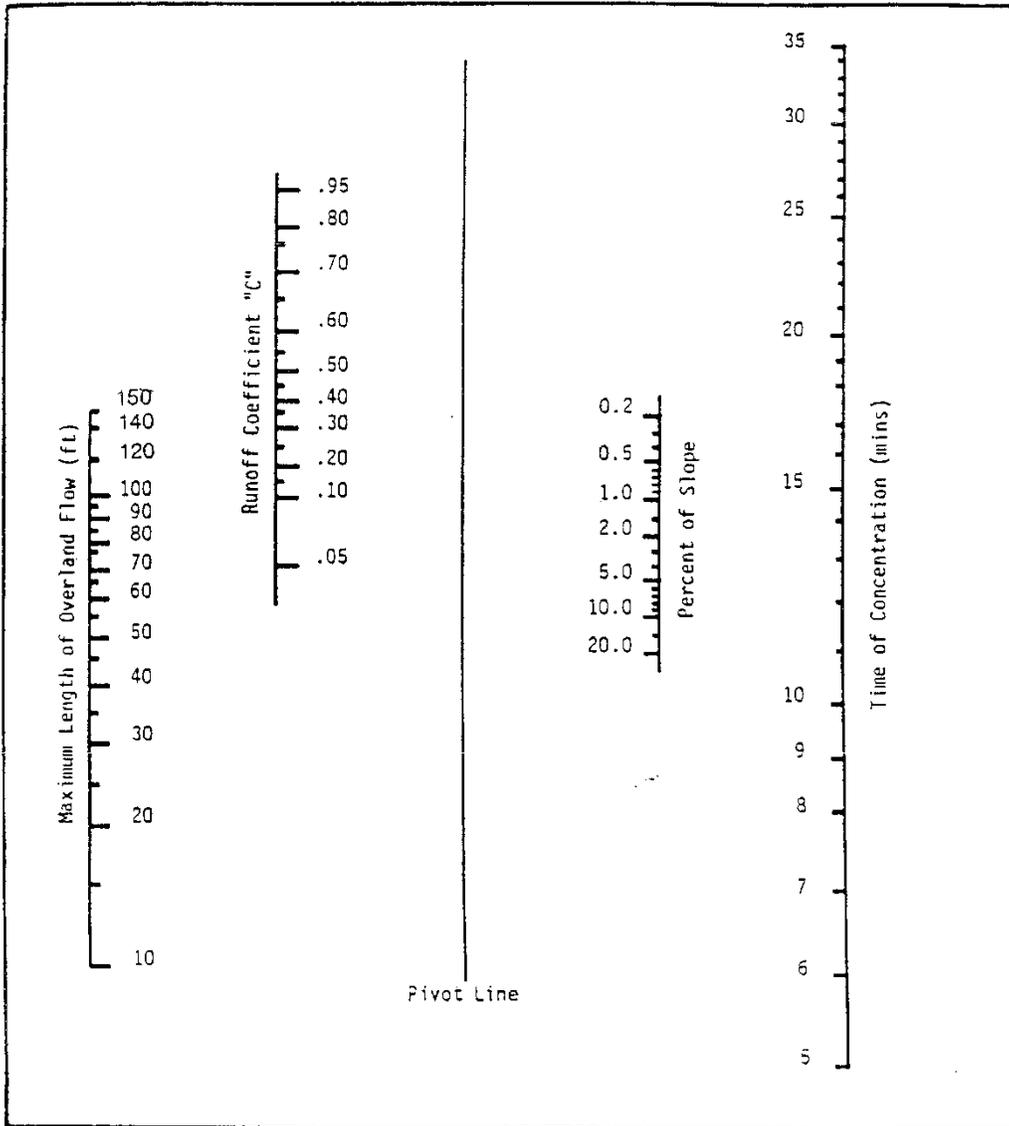
RUNOFF CURVE NUMBERS "CN" FOR SCS METHOD

Runoff Coefficients "C" for Rational Formula												
Soil Group Slope	A			B			C			D		
	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	75	62	73	82	68	78	90	77	88	95
summer conditions	35	51	58	48	55	65	57	65	73	64	69	79
Fallow Fields												
poor conditions	45	54	65	56	63	73	64	74	81	69	77	87
good conditions	30	44	48	43	48	55	48	54	63	56	60	67
Forest/Woodland	30	40	43	42	46	50	45	50	53	50	56	61
Grass Areas												
good conditions	35	51	53	48	54	63	56	59	73	62	63	79
average conditions	45	53	58	52	55	65	60	63	75	65	69	82
poor conditions	48	55	67	56	67	77	66	74	85	73	81	90
Impervious Areas	96	97	98	96	97	98	96	97	98	96	97	98
Weighted Residential												
lot size 1/8 acre	71	75	78	74	76	82	78	80	87	80	83	90
lot size 1/4 acre	62	67	71	66	69	76	67	69	76	75	78	88
lot size 1/3 acre	59	75	69	64	66	74	65	66	75	74	77	87
lot size 1/2 acre	57	63	68	62	64	73	63	65	73	72	76	86
lot size 1 acre	55	62	67	61	63	72	61	64	72	71	75	85

APPENDIX NO. 3

NOMOGRAPH FOR DETERMINING SHEET FLOW

(for use with the Rational Method)



APPENDIX NO. 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 _____

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 ₂in				
5. Land slope, s.....ft/ft				
6. T _t = $\frac{0.007 (nL)^{0.8}}{P_2^{0.5} s^{0.4}}$ Compute T..... hr	+		=	

Shallow Concentrated FlowSegment 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 = $\frac{L}{3600V}$ Compute T _t hr	+		=	

Channel FlowSegment 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 = $\frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n}$ 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. 5

AVERAGE VELOCITIES FOR ESTIMATING TRAVEL TIME FOR SHALLOW CONCENTRATED FLOW

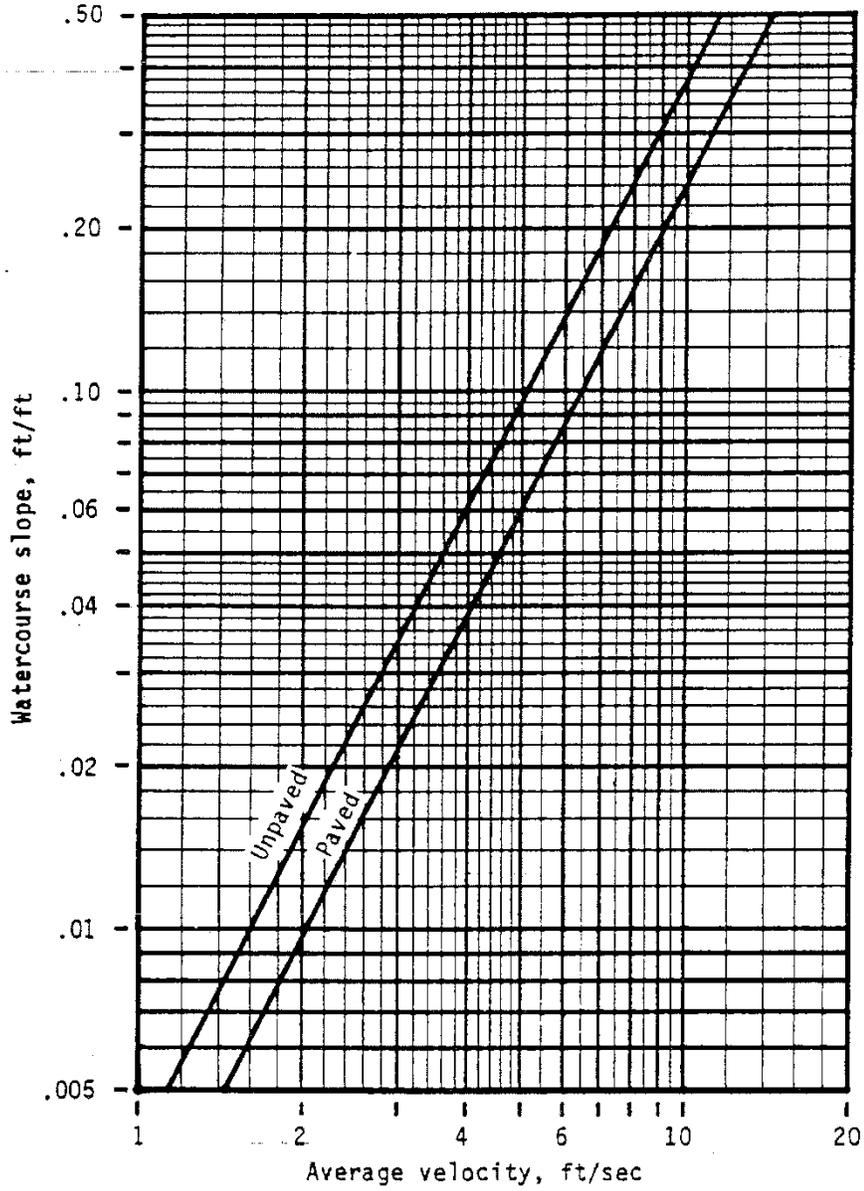


Figure 3-1.—Average velocities for estimating travel time for shallow concentrated flow.

APPENDIX NO. 6 Manning's Coefficient Table

Description	Manning's "n"
Smooth-Wall Plastic Pipe	0.011
Concrete Pipe	0.012
Smooth-Lined Corrugated Metal Pipe	0.012
Corrugated Plastic Pipe	0.024
Annular Corrugated Steel And Aluminum Alloy Pipe (Plain or Polymer Coated)	
68 mm x 13 mm (2 2/3 in x 1/2 in) Corrugations	0.024
75 mm x 25 mm (3 in x 1 in) Corrugations	0.027
125 mm x 25 mm (5 in x 1 in) Corrugations	0.025
150 mm x 50 mm (6 in x 2 in) Corrugations	0.033
Helically Corrugated Steel And Aluminum Alloy Pipe (Plain or Polymer Coated)	
75 mm x 25 mm (3 in x 1 in), 125 mm x 25 mm (5 in x 1 in), or 150 mm x 50 mm (6 in x 2 in) Corrugations	0.024
Helically Corrugated Steel And Aluminum Alloy Pipe (Plain or Polymer Coated)	
68 mm x 13 mm (2 2/3 in x 1/2 in) Corrugations	
a. Lower Coefficients*	
450 mm (18 in) Diameter	0.014
600 mm (24 in) Diameter	0.016
900 mm (36 in) Diameter	0.019
1200 mm (48 in) Diameter	0.020
1500 mm (60 in) Diameter or larger	0.021
b. Higher Coefficients**	0.024
Annular or Helically Corrugated Steel or Aluminum Alloy Pipe Arches or Other Non- Circular Metal Conduit (Plain or Polymer Coated)	0.024
Vitrified Clay Pipe	0.012
Ductile Iron Pipe	0.013
Asphalt Pavement	0.015
Concrete Pavement	0.014
Grass Medians	0.050
Grass - Residential	0.030
Earth	0.020
Gravel	0.030
Rock	0.035
Cultivated Areas	0.030 - 0.050
Dense Brush	0.070 - 0.140
Heavy Timber (Little undergrowth)	0.100 - 0.150
Heavy Timber (With underbrush)	0.40
Streams:	
Some Grass And Weeds (Little or no brush)	0.030 - 0.035
Dense Growth of Weeds	0.035 - 0.050
Some Weeds (Heavy brush on banks)	0.050 - 0.070

Notes:

* Use the lower coefficient if any one (1) of the following conditions apply:

- a. A storm pipe longer than twenty (20) diameters, which directly or indirectly connects to an inlet or manhole, located in swales adjacent to shoulders in cut areas, shoulders in cut areas or depressed medians.
- b. A storm pipe which is specially designed to perform under pressure.

** Use the higher coefficient if any one (1) of the following conditions apply:

- a. A storm pipe which directly or indirectly connects to an inlet or manhole located in highway pavement sections or adjacent to curb or concrete median barrier.
- b. A storm pipe which is shorter than twenty (20) diameters long.
- c. A storm pipe which is partly lined helically corrugated metal pipe.

APPENDIX NO. 7

SAMPLE FORMS

STORM WATER MANAGEMENT CERTIFICATION

I hereby certify that, to the best of my knowledge, the storm water management facilities shown and described hereon are designed in conformance with the Storm Water Management Ordinance of Upper Leacock Township.

_____, 20 ____ * _____

** _____

* Signature of the registered professional responsible for the preparation of the plan.

** Seal of the individual.

LANDOWNER ACKNOWLEDGEMENT OF PERMANENCE OF BMPs

I, the undersigned hereby represent that no person shall modify, remove, fill, landscape, or alter any Storm Water Management BMPs, facilities, areas, or structures without the written approval of Upper Leacock Township.

_____, 20 ____ * _____

* Signature of the owner or owner's agent.

APPENDIX NO. 8

LOW IMPACT DEVELOPMENT PRACTICES

LOW IMPACT DEVELOPMENT PRACTICES ALTERNATIVE APPROACHES FOR MANAGING STORM WATER RUNOFF

Natural hydrologic conditions may be altered radically by poorly planned development practices, such as introducing unneeded impervious surfaces, destroying existing drainage swales, constructing unnecessary storm sewers, and changing local topography. A traditional drainage approach of development has been to remove runoff from a site as quickly as possible and capture it in a detention basin. This approach leads ultimately to the degradation of water quality, as well as expenditure of additional resources for detaining and managing concentrated runoff at some downstream location.

The recommended alternative approach is to promote practices that will minimize post-development runoff rates and volumes, which will minimize needs for artificial conveyance and storage facilities. To simulate pre-development hydrologic conditions, forced infiltration is often necessary to offset the loss of infiltration by creation of impervious surfaces. The ability of the ground to infiltrate runoff depends upon the soil types and its conditions.

Preserving natural hydrologic conditions requires careful alternative site design considerations. Site design practices include preserving natural drainage features, minimizing impervious surface area, reducing the hydraulic connectivity of impervious surfaces, and protecting natural depression storage. A well-designed site will contain a mix of all those features. The following describes various techniques to achieve the alternative approaches:

- ◆ **Preserving Natural Drainage Features.** Protecting natural drainage features, particularly vegetated drainage swales and channels, is desirable because of their ability to infiltrate and attenuate flows and to filter pollutants. However, this objective is often not accomplished in land development. In fact, commonly held drainage philosophy encourages just the opposite pattern - streets and adjacent storm sewers typically are located in the natural headwater valleys and swales, thereby replacing natural drainage functions with a completely impervious system. As a result, runoff and pollutants generated from impervious surfaces flow directly into storm sewers with no opportunity for attenuation, infiltration, or filtration. Developments designed to fit site topography also minimize the amount of grading on site.

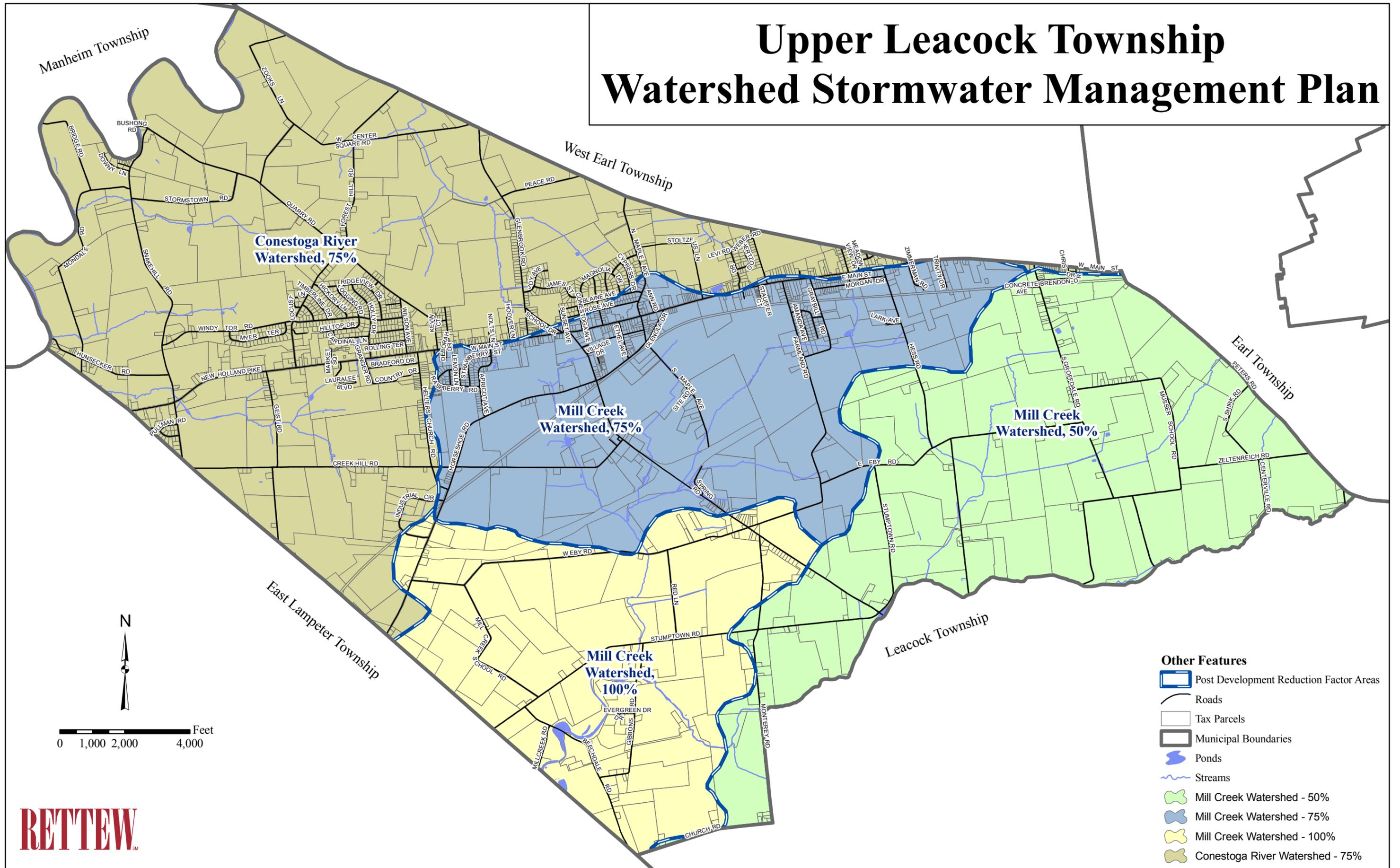
- ◆ **Protecting Natural Depression Storage Areas.** Depressional storage areas have no surface outlet, or drain very slowly following a storm event. They can be commonly seen as ponded areas in farm fields during the wet season or after large runoff events. Traditional development practices eliminate these depressions by filling or draining, thereby obliterating their ability to reduce surface runoff volumes and trap pollutants. The volume and release-rate characteristics of depressions should be protected in the design of the development site. The depressions can be protected by simply avoiding the depression or by incorporating its storage as additional capacity in required detention facilities.

- ◆ **Avoiding Introduction of Impervious Areas.** Careful site planning should consider reducing impervious coverage to the maximum extent possible. Building footprints, sidewalks, driveways, and other features producing impervious surfaces should be evaluated to minimize impacts on runoff.
- ◆ **Reducing the Hydraulic Connectivity of Impervious Surfaces.** Impervious surfaces are significantly less of a problem if they are not directly connected to an impervious conveyance system (such as storm sewer). Two (2) basic ways to reduce hydraulic connectivity are: routing of roof runoff over lawns; and reducing the use of storm sewers. Site grading should promote increasing travel time of storm water runoff and should help reduce concentration of runoff to a single point in the development.
- ◆ **Routing Roof Runoff Over Lawns.** Roof runoff can be easily routed over lawns in most site designs. The practice discourages direct connections of downspouts to storm sewers or parking lots. The practice also discourages sloping driveways and parking lots to the street. The routing of roof drains and crowning the driveway to allow runoff to discharge to pervious areas is desirable as the pervious area essentially acts as a filter strip.
- ◆ **Reducing the Use of Storm Sewers.** By reducing the use of storm sewers for draining streets, parking lots, and backyards, the potential for accelerating runoff from the development can be greatly reduced. The practice requires greater use of swales and may not be practical for some development sites, especially if there are concerns for areas that do not drain in a "reasonable" time. The practice requires educating local citizens and public works officials, who expect runoff to disappear shortly after a rainfall event.
- ◆ **Reducing Street Widths.** Street widths can be reduced by either eliminating on-street parking or by reducing cartway widths. Municipal planners and traffic designers should encourage narrower neighborhood streets, which ultimately could lower maintenance and maintenance related costs.
- ◆ **Using Permeable Paving Materials.** These materials include permeable interlocking concrete paving blocks or porous bituminous concrete. Such materials should be considered as alternatives to conventional pavement surfaces, especially for low use surfaces such as driveways, overflow parking lots, and emergency access roads.
- ◆ **Reducing Building Setbacks.** Reducing building setbacks reduces driveway and entry walks and is most readily accomplished along low-traffic streets where traffic noise is not a problem.
- ◆ **Constructing Cluster Developments.** Cluster developments can also reduce the amount of impervious area for a given number of lots. The biggest savings is in street length, which also will reduce costs of the development, Cluster development "clusters" the construction activity onto less-sensitive areas without substantially affecting the gross density of development.

In summary, careful consideration of the existing topography and implementation of a combination of the above mentioned techniques may avoid construction of costly storm water

control measures. Other benefits include: reduced potential of downstream flooding, reduced water quality degradation of receiving streams and water bodies, enhancement of aesthetics, and reduction of development costs. Beneficial results include: more stable baseflows in receiving streams, improved groundwater recharge, reduced flood flows, reduced pollutant loads,

Upper Leacock Township Watershed Stormwater Management Plan



APPENDIX NO. 10

STORM WATER MANAGEMENT AGREEMENT AND DECLARATION OF EASEMENT

THIS AGREEMENT AND DECLARATION OF EASEMENT made this _____ day of _____, 20____ by and between the **TOWNSHIP OF UPPER LEACOCK**, Lancaster County, Pennsylvania, with a municipal office located at 36 Hillcrest Avenue, Leola, PA 17540 (hereinafter referred to as the “Township”), and _____ (hereinafter referred to as the “Grantor”).

BACKGROUND

Grantor is the owner of certain real estate located _____, in the Township of Upper Leacock, Lancaster County, Pennsylvania, as more specifically described in a deed recorded in Record Book _____, Volume _____ Page _____, in the Office of the Recorder of Deeds in and for Lancaster County, Pennsylvania. (hereafter referred to as the “Premises”) and as shown on the final subdivision plan prepared by _____, Subdivision Plan Book _____, Page _____ (hereafter referred to as the Premises).

Prior to beginning construction on any subdivision and/or land development, Grantor is required, under the Upper Leacock Township Subdivision and Land Development Ordinance and the Upper Leacock Township Storm Water Management Ordinance, as amended (hereinafter collectively referred to as the “Ordinance”), to file a final plan with the Township Supervisors and obtain approval of the final plan from the Township Board of Supervisors. Pursuant to the Ordinance, Grantor must include storm water management data in its subdivision and/or land development application. The Ordinance requires that Grantor’s final plan reflect and/or be accompanied with supporting documentation which identifies the ownership of, and the method of administering and maintaining, all permanent storm water management facilities. Drainage courses, swales, grassed waterways, storm water inlets, pipes, conduits, detention basins, retention basins, infiltration structures, and other storm water management facilities, including Best Management Practices facilities (BMPs) shall be included under the term “storm water

management facilities” in this Agreement and Declaration of Easement. Prior to final approval of any subdivision and land development plan, the issuance of any permit or the commencement of any development, a developer must submit a storm water management plan to the Township for approval. The Upper Leacock Township Storm Water Management Ordinance provides that no approval of any subdivision, land development plan, the issuance of any permit, or the commencement of any development shall be granted prior to the approval of a Storm water management plan.

The purpose of this Agreement and Declaration of Easement is to describe the ownership and maintenance responsibilities for the storm water facilities and the erosion and sedimentation control facilities which will be installed on the Premises and to impose the ownership and maintenance responsibilities upon Grantor, its successors and assigns and upon successor owners of the Premises, and to set forth the rights of the Township.

NOW THEREFORE, intending to be legally bound hereby and in consideration of receiving approval of its Final Plan (hereinafter referred to as the “Final Plan”) from the Board of Supervisors of Upper Leacock Township, and in consideration of receiving permits from the Township to develop the Premises, Grantor, for Grantor and its successors and assigns of Grantor, covenants and declares as follows:

1. The storm water facilities will be owned by the Grantor, its successors and assigns. The phrase storm water facilities shall be deemed to mean both temporary and permanent facilities and erosion and sediment control facilities.

2. All drainage courses, swales, storm water inlets, pipes, conduits, detention basins, BMPs and other storm water facilities shall be installed, constructed and maintained by Grantor, its successors and assigns, in a first-class condition in conformance with the Plan, as approved by the Board of Supervisors, in conformance with any subdivision and land development plan, including any accompanying storm water management plans and information, and as recorded in the Office of the Recorder of Deeds in and for Lancaster County and in a manner sufficient to meet or exceed the performance standards and specifications set forth on the plan as approved by the Township. These responsibilities shall include, but not be limited to, the following:

(a) Liming and fertilizing vegetated channels and other areas according to the specifications in the “Erosion and Sediment Pollution Control Manual” published by the Pennsylvania Department of Environmental Protection or such similar accepted method.

(b) Reestablishment of vegetation by seeding and mulching or sodding of scoured areas or areas where vegetation has not been successfully established.

(c) Mowing as necessary to maintain adequate strands of grass and to control weeds. Chemical weed control may be used if federal, state and local laws and regulations are met. Selection of seed mixtures shall be subject to approval by the Township.

(d) Removal of silt from all permanent drainage structures, in particular, BMPs, in order to maintain the design storage volumes. Regular programs shall be established and maintained.

(e) Regular inspection of the areas in question to assure proper maintenance and care, including but not limited to proper implementation of BMPs. **ADD ANY SPECIFIC INSPECTION REQUIREMENTS IN THE PCSM PLAN.**

(f) Regular maintenance to ensure that all pipes, swales and detention facilities shall be kept free of any debris or other obstruction. **ADD ANY SPECIFIC MAINTENANCE REQUIREMENTS IN THE PCSM PLAN.**

(g) Regular maintenance of the drainage facilities shall consist of weekly inspections of each facility to determine how well the slope stabilization measures are working. All facilities will be inspected after each storm to determine their durability to driving rain and erosion. Sediment cleaned from silt control fences shall be disposed of in an approved disposal area. Any seeded or sodded areas that have become stripped of vegetation shall be re-established with appropriate stabilization materials. This procedure shall be repeated after every sizable storm until no more signs of erosion are evident. At monthly intervals, thereafter, inspections and necessary cleaning will be performed.

(h) Regular maintenance of all facilities designed to improve water quality to ensure that such facility functions in accordance with their design. **IF APPLICABLE, ADD ANY SPECIFIC MAINTENANCE REQUIREMENTS IN THE PCSM PLAN SUCH AS:** Maintenance of the infiltration bed and infiltration system by mowing grass regularly over the infiltration bed; keeping the yard drains and roof drains free of debris in good repair at all times; flushing the infiltration system using a water hose at the cleanouts once every 90 days to ensure the infiltration system is clear of debris; keeping the sumps in the yard inlets and downspout sumps free of debris; and inspecting the infiltration bed four times per year or after each rain event exceeding one inch.

(i) 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, BMPs, and/or other facilities and thus reducing their capacity.

(j) Repair of any subsidence, including subsidence caused by sinkholes.

Grantor, its successors and assigns shall be responsible for performing the foregoing maintenance.

(k) **IF APPLICABLE:** Replacement of displaced riprap within the outlet energy dissipater immediately after it is displaced, particularly after major storm discharge events.

(l) **IF APPLICABLE:** Vacuum sweeping of areas of porous paving to keep surface free of sediment as needed, typically three to four times per year and maintaining all areas of porous paving free from sealing, surfacing or re-paving with non-porous materials.

Include a statement that the approved Operations and Maintenance (O&M) Plan is attached as an exhibit if there are any requirements in addition to those in Paragraph 2.

Grantor, his heirs, personal representatives, successors and assigns, shall be responsible for performing the foregoing maintenance.

3. Grantor, its successors and assigns, agree that the failure to maintain all drainage courses, swales, storm water inlets, pipes, conduits, detention basins, BMPs and other storm water management facilities in a first-class condition in conformance with this Agreement and Plan, as approved by the Board of Supervisors, and with any subdivision or land development plan as recorded, in the Office of the Recorder of Deeds in and for Lancaster County, shall constitute a nuisance and shall be abatable by the Township as such.

4. The Grantor agrees to provide the Township with an annual written report documenting the following items:

(a) Listing of all Post-Construction Storm Water Management (PCSM) Best Management Practices (BMPs) that were installed to meet requirements in NPDES Permits for Stormwater Discharges Associated with Construction Activities approved since March 10, 2003;

(b) The exact location of the PCSM BMP (e.g., street address);

(c) Information (e.g., name, address, phone number(s)) for BMP owner and entity responsible for BMP Operation and Maintenance (O&M), if different from BMP owner;

(d) The type of BMP and the year it was installed;

(e) Maintenance required for the BMP type according to the Pennsylvania Storm Water BMP Manual or other manuals and resources;

(f) The actual inspection/maintenance activities performed for each BMP during the year;

5. Grantor, its successors and assigns, authorize the Township, at any time and from time to time, by its authorized representatives, to enter upon the Premises to inspect the storm water facilities. Grantor acknowledges that the Township has the right to establish a schedule of regular inspections including, but not limited to, annual inspections. If the Township determines to establish a schedule of inspections of storm water management facilities, Grantor, its successors and assigns, shall reimburse the Township for the costs of such inspection and/or pay any annual fee for the administration of a Township storm water management program.

6. The Township may require that Grantor, and assigns or any future owner or occupier of the Premises or any part thereof, take such corrective measures as the Township may deem reasonably necessary to bring the Premises into compliance with this Agreement and with the Plan, as approved by the Board of Supervisors, and with any subdivision and land development plan, including any accompanying storm water management plans and information, and as recorded in the Office of the Recorder of Deeds in and for Lancaster County.

7. Upon the failure of the owner or occupier of the Premises or any part thereof to comply with the terms of this Storm water Management Agreement or to take corrective measures following reasonable notice from the Township, the Township, through its authorized representatives, may take such corrective measures as it deems reasonably necessary to bring the Premises into compliance with this Agreement and with the Plan, as approved by the Board of Supervisors, including any accompanying storm water management plans and information, and as recorded in the Office of the Recorder of Deeds in and for Lancaster County, including but not limited to, the removal of any blockage or obstruction from drainage pipes and swales, detention basins and BMPs, and may charge the cost thereof to Grantor, its successors and assigns, or any owner of the Premises or any part thereof and, in default of such payment, may cause a municipal lien to be imposed upon the Premises or any part thereof. Any municipal lien filed pursuant to this agreement shall be in the amount of all costs incurred by the Township, plus a penalty of ten (10%) of such costs, plus the township's reasonable attorney's fees.

8. Grantor hereby imposes upon the Premises for the benefit of all present and future owners of the Premises or part of the Premises, the Township, and all other property owners affected by the storm water facilities, the perpetual right, privilege and easement for the draining of storm water in and through the drainage courses, swales, storm water inlets, pipes, conduits, detention basins, BMPs and other storm water facilities depicted on the plan or plans submitted to the Township or hereafter made of record and now or hereafter installed on or constructed upon the Premises, and, in addition, easements of access to the storm water facilities.

9. Grantor agrees to indemnify the Township and all of its elected and appointed officials, agents and employees (hereafter collectively referred to as the "Indemnitees") against and hold Indemnitees harmless from any and all liability, loss or damage, including attorneys' fees and cost of investigation and defense, as a result of claims, demands, costs or judgments against Indemnitees which arise as a result of the design, installation, construction or maintenance of the storm water facilities.

10. It is the intent of the parties to this Agreement that personal liability and maintenance obligations shall pass to subsequent title owners upon change in ownership of the Premises or any lot created from the Premises, and such subsequent owners shall assume all personal liability and maintenance obligations for the time period during which they hold title. Personal liability shall remain for any violations of this Agreement and Declaration of Easement which occurred during the period in which an owner held title.

11. The Township may, in addition to the remedies prescribed herein, proceed with any action at law or in equity to bring about compliance with the Upper Leacock Township Storm Water Management Ordinance and/or this Agreement.

12. Grantor shall, upon completion and approval by the Township of the installation of the storm water management facilities, and prior to the release of the improvement security, deposit financial security with the Township to secure the structural integrity of the storm water management facilities as well as the functioning of the storm water management facilities in accordance with the design and specifications of the approved plans. The financial security shall be in the amount of fifteen (15%) percent of the actual cost of installation of the storm water management facilities and shall have a term of not less than eighteen (18) months.

13. If ownership or maintenance responsibility of the storm water management facilities is assigned to a home owner's association, condominium unit owners association, or similar entity, the Township shall be notified. If such association fails to properly maintain the

storm water management facilities, the Township shall have the same rights granted to municipalities under Section 705 of the Pennsylvania Municipalities Planning Code, Act of July 31, 1968, P.L. 805, No. 247, with reference to maintenance of common open space, to maintain the storm water management facilities. Any association so formed shall enter into an agreement with the Township recognizing its duties and the Township's rights under this Agreement.

14. Grantor's personal liability under this Agreement shall cease at such time as (a) all storm water management facilities have been constructed in accordance with the specifications of the Ordinance and with any applicable subdivision and land development ordinance and the approved plans; (b) the storm water management facilities have been inspected and approved the Township Engineer; (c) all financial security, including any maintenance security, posted by Grantor has been released by the Township; and (d) Grantor has transferred all lots to be created from the Premises to third parties. Notwithstanding the foregoing, Grantor's personal liability shall continue for any violations of this Agreement and Declaration of Easement which occurred during the time that Grantor owned the Premises or any lot created from the Premises or in the event the storm water management facilities were not completed, inspected or approved as set forth in (a) through (c) herein.

15. This Agreement and Declaration of Easement shall be binding upon the Grantor, the successors and assigns of Grantor, and all present and future owners of the Premises or any part thereof and shall be recorded in order to give notice to future owners of the Premises of their duties and responsibilities with respect to the storm water facilities. Grantor shall include a specific reference to this Storm Water Management Agreement and Declaration of Easement in any deed of conveyance for the Premises or any part thereof.

16. This Agreement and Declaration of Easement may be amended only by written instrument signed on behalf of all owners of the Premises and the Township.

17. When the tense so requires, words of any gender used in this Agreement and Declaration of Easement shall be held to include any other gender, and the words in the singular number shall be held to include the plural, and vice versa.

IN WITNESS WHEREOF, the undersigned have caused this Agreement and Declaration to be executed on the day and year first above written.

TOWNSHIP OF UPPER LEACOCK

Secretary

By: _____
Supervisor

Witness _____

_____ Owner

Witness _____

_____ Owner

ATTEST: _____ (CORPORATION)

Secretary

By: _____
Title

(TOWNSHIP ACKNOWLEDGMENT)

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF LANCASTER)

On this _____ day of _____, 20__, before me, the undersigned officer, a notary public in and for the aforesaid Commonwealth and County, personally appeared _____, who acknowledged _____self to be (Vice)Chairman, Supervisor of the Board of Supervisors of the Township of Upper Leacock, Lancaster County, Pennsylvania, and that he/she, as such officer, being authorized to do so, executed the foregoing Storm Water Management Agreement and Declaration of Easement, for the purposes therein contained, by signing the name of such Township by _____self as such officer.

IN WITNESS WHEREOF, I set my hand and official seal.

Notary Public
Lancaster, Lancaster County

My Commission Expires:

(CORPORATE ACKNOWLEDGMENT)

STATE OF)
) SS:
COUNTY OF)

On this _____ day of _____, 20__, before me, the undersigned officer, a notary public in and for the aforesaid State and County, personally appeared _____, who acknowledged himself to be the _____ and that being duly authorized to do so as such corporate officer, executed the foregoing Storm Water Management Agreement and Declaration of Easement, for the purposes therein contained, on behalf of the corporation.

IN WITNESS WHEREOF, I set my hand and official seal.

Notary Public
Lancaster, Lancaster County

My Commission Expires:

