

**SOUTH LEBANON TOWNSHIP  
STORMWATER MANAGEMENT ORDINANCE**



**1800 South 5<sup>th</sup> Avenue  
Lebanon, PA 17042**

**Lebanon County, PA**

**ORDINANCE NO. 376**

**Adopted at a Public Meeting Held on September 27, 2022**

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## **ARTICLE I. GENERAL PROVISIONS**

### **Section 101. Title**

This Ordinance shall be known as the “South Lebanon Township Stormwater Management Ordinance.”

### **Section 102. Statement of Findings**

- A. Inadequate management of accelerated stormwater runoff resulting from development throughout a watershed increases flood flows and velocities, contributes to erosion and sedimentation, overtakes the carrying capacity of existing streams and storm sewers, greatly increases the cost of public facilities to convey and manage stormwater, undermines floodplain management and flood reduction efforts in upstream and downstream communities, reduces groundwater recharge, threatens public health and safety, and increases non-point source pollution of water resources.
- B. A comprehensive program of stormwater management, including reasonable regulation of development and activities causing accelerated runoff, is fundamental to the public health, safety, welfare, and the protection of people of South Lebanon Township and all the people of the Commonwealth, their resources, and the environment.
- C. Stormwater is an important water resource that provides groundwater recharge for water supplies and base flow of streams, which also protects and maintains surface water quality.
- D. The use of green infrastructure and low impact development (LID) are intended to address the root cause of water quality impairment by using systems and practices which use or mimic natural processes to (1) infiltrate and recharge, (2) evapotranspire, and/or (3) harvest and use precipitation near where it falls to earth. Green infrastructure practices and LID contribute to the restoration or maintenance of pre-development hydrology.
- E. Reasonable regulation of connections and discharges to municipal separate storm sewer systems is fundamental to the public health, safety and welfare and the protection of people of the Commonwealth, their resources, and the environment.
- F. Public education on the control of pollution from stormwater is an essential component in successfully addressing stormwater issues.
- G. Federal and state regulations require certain municipalities to implement a program of stormwater controls. These municipalities are required to obtain a permit for stormwater discharges from their separate storm sewer systems under the National Pollutant Discharge Elimination System (NPDES). Permittees are required to enact, implement, and enforce a prohibition of non-stormwater discharges to the permittee’s regulated small municipal separate storm sewer system (MS4).
- H. Non-stormwater discharges to municipal separate storm sewer systems can contribute to pollution of the Waters of the Commonwealth.

### **Section 103. Purpose**

The purpose of this Ordinance is to promote health, safety, and welfare within South Lebanon Township, by minimizing the harms and maximizing the benefits described in the Statement of Findings (Section 102) through provisions intended to:

- A. Meet legal water quality requirements under state law, including regulations at 25 Pa. Code Chapter 93 to protect, maintain, reclaim, and restore the existing and designated uses of the Waters of the Commonwealth.
- B. Preserve the natural drainage systems to the maximum extent possible.
- C. Manage stormwater impacts close to the runoff source, reduce runoff volumes and mimic pre-development hydrology.
- D. Manage accelerated runoff and erosion and sedimentation problems close to their source by regulating activities that cause these problems.
- E. Provide procedures, performance standards, and design criteria for stormwater planning and management.
- F. Maintain groundwater recharge, to prevent degradation of surface and groundwater quality, and to otherwise protect water resources.
- G. Preserve and restore the flood-carrying capacity of streams and prevent scour and erosion of stream banks and streambeds.
- H. Provide proper operations and maintenance of all temporary and permanent stormwater management facilities and Best Management Practices (BMPs) that are constructed and implemented.
- I. Provide standards to meet the NPDES permit requirements.
- J. Implement an “illegal discharge detection and elimination program” within South Lebanon Township to address non-stormwater discharges into the Township’s municipal separate storm sewer system (MS4).
- K. Coordinate land development in accordance with the Zoning Ordinance; Subdivision and Land Development Ordinance; Township, Regional, and County Comprehensive Plans; Watershed Plans; and other plans of the Township and County.

### **Section 104. Statutory Authority**

South Lebanon Township is empowered to regulate land use activities that affect runoff by the authority of the Act of October 4, 1978, P.L. 864, No. 167, 32 P.S. Section 680.1 et seq., as amended (The Stormwater Management Act); the Act of October 4, 1978, P.L. 851, No. 166, 32 P.S. Section 679.101 et seq., as amended (The Floodplain Management Act); and the Act of July 31, 1968, P.L. 805, No. 247, as amended (The Pennsylvania Municipalities Planning Code).

### **Section 105. Applicability**

- A. All regulated activities, as defined in Section 201, that may affect stormwater runoff, including land development and earth disturbance activities, are subject to regulation by this ordinance.
- B. All activities related to proper operation and maintenance of approved stormwater management BMPs and all activities that may contribute non-stormwater discharges to a regulated small MS4 are subject to regulation by this Ordinance.
- C. Earth disturbance activities and associated stormwater management controls are also regulated under existing state law and implementing regulations. This Ordinance shall operate in coordination with those parallel requirements. The requirements of this Ordinance shall be no less restrictive in meeting the purposes of this Ordinance than state law.

### **Section 106. Repealer**

Any ordinance or ordinance provision(s) of South Lebanon Township inconsistent with any of the provisions of this Ordinance is hereby repealed to the extent of the inconsistency only.

### **Section 107. Severability**

In the event that a court of competent jurisdiction declares any section(s) or provision(s) of this Ordinance invalid, such decision shall not affect the validity of any of the remaining section(s) or provision(s) of this Ordinance.

### **Section 108. Compatibility with Other Ordinance Requirements**

- A. Approvals issued, and actions taken pursuant to this Ordinance do not relieve the applicant of the responsibility to comply with or to secure required permits or approvals for activities regulated by any other applicable codes, laws, rules, statutes, or ordinances. To the extent that this Ordinance imposes more rigorous or stringent requirements for stormwater management, the specific requirements contained in this Ordinance shall be followed. Conflicting provisions in other ordinances or regulations shall be construed to retain the requirements of this Ordinance addressing state water quality requirements.
- B. The degree of stormwater management sought by the provisions of this Ordinance is considered reasonable for regulatory purposes. When applicable, this ordinance shall be used in conjunction with the South Lebanon Township Subdivision and Land Development Ordinance (SALDO). This Ordinance shall not create liability on the part of South Lebanon Township, any appointed or elected official of South Lebanon Township, the Lebanon County Conservation District, or any employee thereof for any erosion, sedimentation or flood damages that result from reliance on this Ordinance, or any administrative decision lawfully made there under.

### **Section 109. Duty of Persons Engaged in the Development of Land**

Notwithstanding any provision(s) of this Ordinance, including exemptions, any landowner or any person engaged in the alteration or development of land which may affect stormwater runoff characteristics shall implement such measures as are reasonably necessary to prevent injury to health, safety, or other property. Such measures also shall include actions as are required to

manage the rate, volume, direction, and quality of resulting stormwater runoff in a manner which otherwise adequately protects health, property, and water quality.

**Section 110. Stormwater Management Data**

The stormwater management data shall identify all proposed stormwater management facilities and supportive information stated in this part. Stormwater management plans and reports shall only be prepared by licensed professionals registered in the Commonwealth of Pennsylvania who are qualified to perform such duties.

**Section 111. 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 112. Waivers**

If South Lebanon Township determines that any requirement under this Ordinance cannot be achieved for a specific regulated activity, the Township may, after an evaluation of alternatives, approve measures other than those in this Ordinance, subject to Section 408, Paragraphs A, B and C.

**Section 113. Township Liability**

Except as specifically provided by the Pennsylvania Stormwater Management Act, Act of October 4, 1978, P.L. 864, No. 167, as amended, 32 P.S. §680.1 et seq., the making of any administrative decision by South Lebanon Township or any of its officials or employees shall not constitute a representation, guarantee or warranty of any kind by the Township of the practicability or safety of any proposed structure or use with respect to damage from erosion, sedimentation, stormwater runoff, flood, or any other matter, and shall create no liability upon or give rise to any cause of action against the Township and its officials and employees. The Township, by enacting and amending this Ordinance, 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. §8541 et seq., and does not assume any liabilities or obligations.

**Section 114. Effective Date**

This Ordinance shall take effect and be in force five (5) days after its enactment by the Board of Supervisors of the Township of South Lebanon, as provided by law.

## ARTICLE II. DEFINITIONS

### Section 201. Definitions

For the purpose 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 includes the singular; words of masculine gender include feminine gender; and words of feminine gender include masculine gender.
- 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, occupied or maintained.”
- F. The words “watershed”, “sub-watershed” and “drainage area” are synonymous and refer to the contributing area of interest.
- G. Word list. As used in this Ordinance, the following terms shall have the meanings indicated:

**Accelerated Erosion** – The removal of the surface of the land through the combined action of man’s activities and the natural process at a rate greater than would occur because of the natural process alone.

**Agricultural Activities** – Activities associated with agriculture such as cultivation of soil, farming, dairying, pasturage, agriculture, horticulture, floriculture, forestry, viticulture, and animal and poultry husbandry and the necessary accessory uses for packing, treating, or storing the produce and equipment. Construction of new buildings or impervious area is not considered an agricultural activity.

**Alteration** – As applied to land, a change in topography resulting from the moving of soil and rock from one location or position to another; the changing of surface conditions by causing the surface to be more or less impervious; land disturbance.

**Applicant** – A landowner or developer, as hereinafter defined, who has filed an application for approval to engage in any Regulated Activities at a project site within South Lebanon Township, including his heirs, successors, and assigns.

**Best Management Practices (BMPs)** – Activities, facilities, measures, planning, or procedures used to manage stormwater impacts from Regulated Activities, to meet State Water Quality Requirements, to promote groundwater recharge and to otherwise meet the purposes of this Ordinance. Stormwater BMPs are commonly grouped into one of two broad categories or measures: "non-structural" or "structural". "Non-structural" BMPs are measures referred to as operational and/or behavior-related practices that attempt to minimize the contact of pollutants with stormwater runoff whereas "structural" BMPs are measures that consist of a physical device or practice that is installed to capture and treat stormwater runoff. "Structural" BMPs include, but are not limited to, a wide variety of practices and devices, from large-scale 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" stormwater BMPs are permanent appurtenances to the project site.

**BMP Manual** – Shall mean the Pennsylvania Stormwater Best Management Practices Manual as published by the Department of Environmental Protection, Bureau of Watershed Management, document number: 363-0300-002, effective date: December 30, 2006, and as amended.

**Baffles** – Guides, grids, grating, earthen berms, or similar devices placed in a pond to deflect or regulate flow and create a longer flow path.

**Bioretention** – A water quality practice that utilizes landscaping and soils to treat stormwater runoff by collecting it in shallow depressions before filtering through a fabricated planting soil media.

**Board of Supervisors (Board)** – The South Lebanon Township Board of Supervisors.

**Bridge** – For the purpose of this ordinance a bridge is defined as a stormwater conveyance structure requiring an effective span or diameter exceeding 6 feet.

**Carbonate Geology** – Limestone or dolomite bedrock also marble (within graphitic felsic gneiss fm).

**Check Dam** – An earthen, stone or log structure, used in grass swales to reduce water velocities, promote sediment deposition, and enhance infiltration.

**Commonwealth** – The Commonwealth of Pennsylvania.

**Conservation District** – The Lebanon County Conservation District (LCCD). The Lebanon County Conservation District has the authority under a delegation agreement executed with the Pennsylvania Department of Environmental Protection to administer all or a portion of the erosion and sediment control program and construction activities within the political boundaries of Lebanon County, Pennsylvania, including South Lebanon Township.

**Construction** – The term “construction” shall include the building, reconstruction, extension, expansion, alteration, substantial improvement, or erection or relocation of a building or structure, including manufactured homes, and gas or liquid storage tanks. For floodplain purposes, “new construction” includes structures for which the “start of construction” commenced on or after the effective date of a floodplain management regulation adoption by the municipality.

**Conveyance** – The ability of a pipe, culvert, swale, or other similar facility to carry the peak flow from the design storm.

**Conveyance Facility** – A stormwater management facility designed to convey stormwater runoff and shall include streams, channels, swales, pipes, conduits, culverts, storm sewers, etc.

**County** – Lebanon County, Pennsylvania.

**Culvert** – A structure with appurtenant works that carries a stream and/or stormwater runoff under or through an embankment or fill.

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

**Department of Environmental Protection (DEP or PADEP)** – The Pennsylvania Department of Environmental Protection or any successor agency thereto.

**Department of Transportation (PennDOT)** – The Pennsylvania Department of Transportation or any successor agency thereto.

**Design Storm** – The magnitude and temporal distribution of precipitation from a storm event measured in probability of occurrence (e.g., a 25-year storm) and duration (e.g., 24 hours), used in the design and evaluation of stormwater management systems. Also see “Return Period.”

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

**Detention Pond** – A vegetated pond designed to collect water runoff for a given storm event and release it at a pre-determined rate; also known as a “dry pond.”

**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, filling, grading, paving, excavating, earth disturbance activity, mining, dredging, or drilling operations, the placement of manufactured homes, streets and other paving, utilities, and the subdivision of land.

**Disturbed Area** – An un-stabilized land area where an earth disturbance activity is occurring or has occurred.

**Downslope Property Line** – That portion of the property line of the lot, tract, or parcels of land being developed located such that overland or piped flow from the site would be directed toward it.

**Drainage Easement** – A right granted by a landowner to a grantee, allowing the use of private land for stormwater management, drainage, or conveyance 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, mineral extraction, and the moving, depositing, stockpiling, or storing of soil, rock, or earth materials.

**Energy Dissipater** – A device used to slow the velocity of stormwater particularly at points of concentrated discharge such as pipe outlets.

**Erosion** – The natural process by which the surface of the land is worn away by water, wind or chemical action.

**Erosion and Sediment Pollution Control Plan** – A site specific plan consisting of both drawings and narrative that identifies BMPs that minimize accelerated erosion and sediment pollution before, during and after earth disturbance activities.

**Excavation** – Any act by which earth, sand, gravel, rock, or any other similar material is dug into, cut, quarried, uncovered, removed, displaced, relocated, or bulldozed. It shall include the conditions resulting there from.

**Exceptional Value Waters** – Surface waters of high quality, which satisfies 25 Pa. Code Chapter 93 – Water Quality Standards, § 93.4b(b).

**Existing Conditions** – All existing pervious land cover 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.

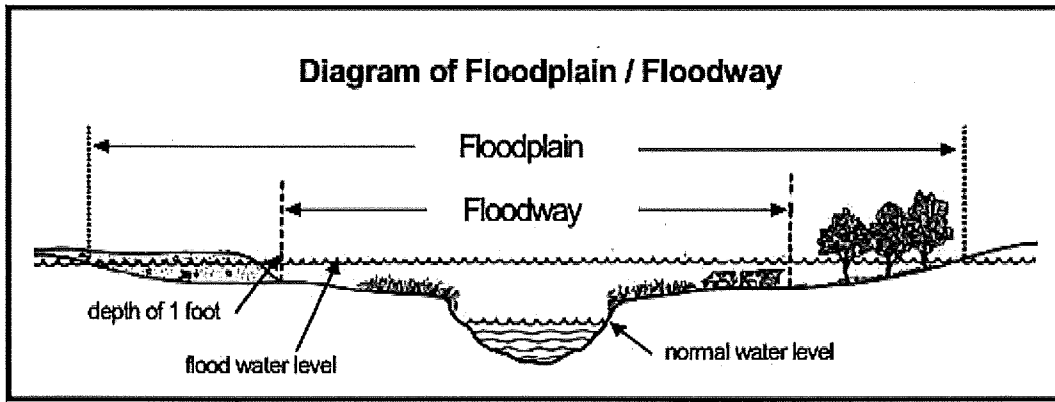
**Extended Detention** – A stormwater design feature that provides for the gradual release of a volume of water in order to increase settling of pollutants and protect downstream channels from frequent storm events.

**FEMA** – the Federal Emergency Management Agency.

**Fill** – Any act by which earth, sand, gravel, rock or any other material is placed, pushed, dumped, pulled, transported or moved to a new location above the natural surface of the ground or on top of the stripped surface and shall include the conditions resulting there from; the difference in elevation between a point on the original ground and a designated point of higher elevation on the final grade; the material used to make fill.

**Filter Strip** – A strip of permanent vegetation above ponds, diversions, and other structures to retard the flow of runoff, causing deposition of transported material, thereby reducing sedimentation.

**Floodplain** – A relatively flat or low land area which is subject to partial or complete inundation from an adjoining or nearby stream, river, or watercourse; and/or any area subject to the unusual and rapid accumulation of surface waters from any natural source; and/or any land delineated as a special flood hazard area (SFHA) on applicable FEMA maps and studies.



**Floodway** – The channel of watercourse and those portions of the adjoining floodplains that are reasonably required to carry and discharge the 100-year frequency flood. Unless otherwise specified, the boundary of the floodway is as indicated on maps and flood insurance studies provided by FEMA. In an area where no FEMA maps or studies have defined the boundary of the 100-year frequency floodway, it is assumed, absent evidence to the contrary, that the floodway extends from the top of the bank to 50 feet away from the stream.

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

**Freeboard** – A vertical distance between the elevation of the design high water and the top of a dam, levee, tank, basin, or diversion ridge. The space is required as a safety margin in a pond or basin.

**Grade** – The slope expressed in a percent that indicates the rate of change of elevation in linear feet per hundred linear feet

**Grading** – The act of moving earth. Changing of the earth surface by excavation or fill.

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

**Green Infrastructure** – Systems and practices that use or mimic natural processes to infiltrate, evapotranspire, or reuse stormwater in the site where it is generated.

**Groundwater Recharge** – Replenishment of existing natural underground water supplies.

**High Quality Waters** – Surface waters having quality, which exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water by satisfying 25 Pa. Code Chapter 93 – Water Quality Standards, § 93.4b(a).

**Hydrograph** – a graph showing the rate of flow (discharge) versus time past a specific point in a river or other channel or conduit carrying flow, or to a point of interest. The rate of flow is typically expressed in cubic meters or cubic feet per second (cms or cfs).

**Hydrologic Soil Group (HSG)** – A classification of soils by the Natural Resources Conservation Service into one of four HSG classifications (A, B, C, and D) according to their minimum infiltration rate, which is obtained for bare soil after prolonged wetting. The Natural Resources Conservation Service (NRCS) of the United States Department of Agriculture (USDA) 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 interest may be identified from a soil survey report generated by the use of the NRCS Web Soil Survey at <http://websoilsurvey.nrcs.usda.gov>. Soils become less pervious as the HSG varies from A to D.

**Impervious Surface (Impervious Area)** – Any surface that prevents percolation of water into the ground. All structures, buildings, parking areas, driveways, roads, sidewalks and any other areas concrete, asphalt, stone, or gravel shall be considered impervious surface. In addition, all other areas as determined by the Township Engineer to be impervious within the meaning of this definition shall also be considered impervious surface.

**Impoundment** – A retention or detention basin designed to retain stormwater runoff and release it at a controlled rate.

**Improvements** – Any structure or paving placed upon land, including the provision of underground or above-ground utilities, as well as any physical change to the surface of the land, including but not necessarily limited to grading, paving, the placement of stormwater management facilities, sidewalks, street signs, traffic control devices, and monuments. This definition shall expressly exclude the tilling of soil.

**Infiltration Facilities** – A structural BMP designed to direct runoff into the ground (e.g., dry well/seepage pit, rain garden, infiltration trench, infiltration basin, pervious pavement with infiltration bed, vegetated swale, etc.).

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

**Karst** – A type of topography or landscape characterized by surface depressions, sinkholes, rock pinnacles/uneven bedrock surface, steep-sided hills, underground drainage, and caves. Karst is formed on carbonate rocks, such as limestone, dolomites, marble and sometimes gypsum.

**Land Development** – Any of the following activities:

- A. The improvement of one (1) lot or two (2) or more contiguous lots, tracts, or parcels of land for any purpose involving:
  1. A group of two (2) or more residential or nonresidential buildings, whether proposed initially or cumulatively, or a single nonresidential building on a lot or lots regardless of the number of occupants or tenure; or
  2. The division or allocation of land or space, whether initially or cumulatively, between or among two (2) or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups or other features.
- B. Any subdivision of land.

C. The following activities are excluded from this term:

1. The conversion of an existing single-family detached dwelling into not more than three (3) residential units, unless such units are intended to be a condominium;
2. The addition of an accessory building/use, including farm buildings, on a lot or lots subordinate to an existing principal residence or farm; and
3. The addition or conversion of buildings or rides within the confines of an enterprise which would be considered an amusement park. For the purpose of this sub clause, an amusement park is defined as a tract of land, or area used principally as a location for permanent amusement structures or rides. This exclusion shall not apply to newly acquired acreage by an amusement park until plans for the expanded areas have been approved by proper authorities.

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

**Level Spreader** – A level structural device providing a smooth stable surface such as concrete or similar non-degradable material which effectively distributes stormwater uniformly over the ground surface as sheet flow to prevent concentrated, erosive flows and promote infiltration.

**Licensed Professional** – Professional engineers, landscape architects, geologists, and land surveyors licensed to practice within the Commonwealth of Pennsylvania.

**Limits of Disturbance** – An outline shown on the Erosion and Sediment Pollution Control and Stormwater Management Site Plan indicating the boundary of the total area to be disturbed during a proposed earth disturbance activity.

**Low Impact Development (LID)** – Site design approaches and small-scale stormwater management practices that promote the use of natural systems for infiltration, evapotranspiration, and reuse of rainwater. LID can be applied to new development, urban retrofits, and revitalization projects. LID utilizes design techniques that infiltrate, filter, evaporate, and store runoff close to its source. Rather than rely on costly large-scale conveyance and treatment systems, LID addresses stormwater through a variety of small, cost-effective landscape features located on-site.

**Manning's Equation (Manning's Formula)** – A method for calculation of velocity of flow (e.g., feet per second) and flow rate (e.g., cubic feet per second) in open channels based upon channel shape, roughness, depth of flow and slope. "Open channels" may include closed conduits so long as the flow is not under pressure.

**Municipality** – South Lebanon Township, Lebanon County, Pennsylvania.

**National Pollutant Discharge Elimination System (NPDES)** – The national system for the issuance of permits under Section 402 of the Federal Clean Water Act (33 u.s.c.a. 1342) including a state or interstate program which has been approved in whole or in part by the Environmental Protection Agency, including the regulations codified in 25 Pa. Code Chapter 92a (NPDES permitting, monitoring and compliance) and Chapter 102 (Erosion and Sediment Control).

**NPDES Permit for Stormwater Discharges associated with Construction Activities** – A permit required for the discharge or potential discharge of stormwater into waters of the Commonwealth from construction activities, including clearing and grubbing, grading and excavation activities involving one (1) acre or more of earth disturbance activity or an earth disturbance activity on any portion, part, or during any stage of a larger common plan of development that involves one (1) acre or more of earth disturbance activity over the life of the project.

**Natural Drainage Flow** – The pattern of surface and stormwater drainage from a particular site before construction or installation of improvements or prior to any re-grading.

**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 Study Center, Silver Spring, Maryland (2004). NOAA's Atlas 14 can be accessed at Internet address: <http://hdsc.nws.noaa.gov/hdsc/pfds/>.

**Non-point Source Pollution** – Pollution that enters a water body from diffuse origins in the watershed and does not result from discernible, confined, or discrete conveyances.

**NRCS** – Natural Resources Conservation Service. Previously Soil Conservation Service (SCS).

**One Hundred (100) Year Flood** – The flood, also known as the base flood, which has a 1% chance of being equaled or exceeded in any given year; the flood which has been selected to serve as the basis upon which the flood plain management provisions of this and other ordinances have been prepared.

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

**Outlet** – Points of water disposal from a stormwater conveyance system, stream, river, lake, tidewater, or artificial drain.

**Parent Tract** – All contiguous land held in single and separate ownership, regardless whether (i) such land is divided into one or more lots, parcels, purports or tracts; (ii) such land was acquired by the landowner at different times or by different deeds, devise, partition or otherwise; or (iii) such land is bisected by public or private streets or right-of-way, which was held by the landowner or his predecessor in title on the effective date of this Ordinance.

**Parking Lot Storage** – Involves the use of impervious or semi-impervious parking areas as temporary impounds with controlled release rates during rainstorms.

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

**Pennsylvania Municipalities Planning Code** – Adopted as Act 247 of 1968, this act enables municipalities to plan for, and regulate community development with subdivision and land development ordinances. The code also contains guidelines for subdivision and land development ordinance content. For the purpose of this ordinance, the Code is referred to as “Act 247,” and is intended to include the current code and any further amendments thereto.

**Person** – An individual, partnership, public or private association or corporation, or a governmental unit, public utility, or any other legal entity whatsoever which is recognized by law as the subject of rights and duties.

**Pervious Area** – Any area not defined as impervious.

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

**Point Source** – A discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, Concentrated Aquatic Animal Production Facility, Concentrated Animal Feeding Operation, landfill leachate collection system, or vessel or other floating craft, from which pollutants are or may be discharged, as defined in State regulations at 25 Pa. Code § 92a.2.

**Project Site** – The specific area of land where any regulated activities are planned, conducted, or maintained and within the jurisdiction of this Ordinance.

**Pollutant** – Any contaminant or other alteration of the physical, chemical, biological or radiological integrity of surface water which causes or has the potential to cause pollution as defined in Section 1 of the Clean Streams Law (35 P.S., 691.1- 691.1001).

**Pollution** – Contamination of any surface waters that will create or is likely to create a nuisance or render such waters harmful, detrimental or injurious to public health, safety or welfare, or to domestic, municipal, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other aquatic life, including but not limited to such contamination by alteration of the physical, chemical or biological properties of such waters or change in temperature, taste, color or odor thereof, or the discharge of any liquid, gaseous, radioactive, solid or other substances into such waters.

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

**Rational Formula** – A rainfall-runoff relation used to estimate peak flow.

**Recharge Volume** – The portion of the water quality volume used to maintain groundwater recharge rates at development sites.

**Regulated Activities** – Any earth disturbance activities or any activities that involve the alteration or development of land in a manner that may affect stormwater runoff and activities that may contribute non-stormwater runoff discharges to a regulated small MS4.

“Regulated Activities” include, but are not limited to, the following listed items:

- A. Earth Disturbance Activities
- B. Land Development.
- C. Subdivision.
- D. Construction of new or additional impervious or semi-impervious surfaces.
- E. Construction of new buildings or additions to existing buildings.
- F. Diversion or piping of any natural or man-made stream channel.
- G. Installation of new or modification of existing stormwater management facilities or appurtenances thereto.
- H. Installation of new or modification of existing stormwater BMPs.
- I. Changes in soil absorption caused by compaction during development or timber harvesting.
- J. Redirection or concentration of runoff to adjoining properties, as it relates to properties regulated under this ordinance.
- K. Modification in contours, including filling and/or draining of low areas, as it relates to properties regulated under this ordinance.

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

**Release Rate** – The percentage, or event criteria of the pre-development peak rate of runoff from a site or subwatershed area to which the post-development peak rate of runoff must be reduced to protect downstream areas.

**Removed Runoff** – The volume of runoff that is captured and not released directly into the surface Waters of the Commonwealth during or after a storm event.

**Retention Basin** – A pond containing a permanent pool of water designed and/or constructed to store water runoff for a given storm event and release it at a predetermined rate.

**Return Period** – The average interval, in years, within which a storm event of a given magnitude can be expected to recur. For example, the probability of a 25-year storm occurring in any one given year is 0.04 (i.e. a 4% chance).

**Riparian Buffer** – A permanent vegetated area bordering surface waters, that serves as a protective filter to help protect streams and wetlands from impacts of adjacent land uses.

**Riser** – A vertical structure extending from the bottom of a pond that is used to control the discharge rate from the pond for a specified design storm.

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

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

**Runoff Capture Volume** – The volume of runoff that is captured (retained) and not released into surface Waters of the Commonwealth during or after a storm event.

**Sediment** – Soils or other erodible materials transported by stormwater as a product of erosion.

**Sediment Basin** – An impoundment being used to remove sediment from stormwater runoff.

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

**Sedimentation** – The process by which mineral or organic matter is accumulated or deposited by the movement of air or water.

**Seepage Pit/Seepage Trench** – An area of excavated earth filled with loose stone or similar course material, into which water is directed for infiltration into the ground.

**Separate Storm Sewer System** – A conveyance or system of conveyances (including roads with drainage systems, Municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) primarily used for collecting and conveying stormwater runoff.

**Shallow Concentrated Flow** – Runoff pattern following sheet flow, prior to open channel flow.

**Sheet Flow** – Runoff flow that occurs overland in places where there are no defined channels, the flood water spreads out over a large area at a uniform depth. This also referred to as overland flow.

**Site Improvements** – Physical additions or changes to the land that may be necessary to provide usable and desirable lots, including but not limited to, utilities, streets, curbing, sidewalks, streetlights, and stormwater facilities.

**Slope** – Deviation of any surface from horizontal. For engineering purposes, slopes are usually expressed in a percentage based upon vertical difference in feet per 100 feet of horizontal distance.

**Soil Cover Complex Method** – A method of runoff computation developed by the NRCS that is based on relating soil type and land use/cover to a runoff parameter called Curve Number (CN).

**Spillway (Emergency)** – A depression in the embankment of a pond or basin, or other overflow structure, that is used to pass peak discharges greater than the maximum design storm controlled by the pond or basin.

**Stabilization** – The proper placing, grading, constructing, reinforcing, lining, and covering of soil, rock or earth to ensure its resistance to erosion, sliding or other movement.

**State Water Quality Requirements** – The regulatory requirements to protect, maintain, reclaim, and restore water quality under Title 25 of the Pennsylvania Code and the Clean Streams Law – including, but not limited to:

- A. Each stream segment in Pennsylvania has a “designated use,” such as “cold water fishery” or “potable water supply,” which is listed in Chapter 93. These uses must be protected and maintained, under state regulations.
- B. “Existing uses” are those attained as of November 1975, regardless of whether they have been designated in Chapter 93. Earth disturbance activities must be designed to protect and maintain existing uses and maintain the level of water quality necessary to protect those uses in all streams, and to protect and maintain water quality in special protection streams.
- C. Water quality involves the chemical, biological, and physical characteristics of surface water bodies. After earth disturbance activities are complete, these characteristics can be impacted by addition of pollutants such as sediment, and changes in habitat through increased flow volumes and/or rates as a result of changes in land surface area from those activities. Therefore, permanent discharges to surface waters must be managed to protect the stream bank, stream bed, and structural integrity of the waterway, to prevent these impacts.
- D. Protection and maintenance of water quality in special protection streams pursuant to 25 Pa. Code Chapter 93.

**Storage Indication Method** – A reservoir routing procedure based on solution of the continuity equation (inflow minus outflow equals the change in storage) with outflow defined as a function of storage volume and depth.

**Storm Frequency** – The number of times that a given storm “event” occurs or is exceeded on the average in a stated period of years.

**Storm Sewer** – A system of pipes and/or open channels that convey intercepted runoff and stormwater from other sources but excludes domestic sewage and industrial wastes.

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

**Stormwater Detention** – Any storm drainage technique that retards or detains runoff, such as detention or retention basins, parking lot storage, rooftop detention, porous pavement, dry wells, or any combination thereof.

**Stormwater Detention Basin** – A vegetated pond designed to drain completely after storing runoff only for a given storm event and release it at a predetermined rate; also known as a “dry pond.”

**Stormwater Management** – A program of controls and measures designed to regulate the quantity and quality of stormwater runoff from a development while promoting the protection and conservation of groundwater and groundwater recharge.

**Stormwater Management District** – A watershed or subwatershed area for which separate stormwater management regulations or criteria have been established.

**Stormwater Management Facilities (SWM BMPs)** – A system designed to handle stormwater runoff, and where required, delay the peak discharge long enough to minimize the potential for downstream flooding. Any structure, natural or man-made, that, due to its condition, design, or construction; conveys, stores, or otherwise affects stormwater runoff. Typical stormwater management facilities include, but are not limited to detention basins, wet ponds, open channels, storm sewers, pipes and infiltration facilities.

**Stormwater Management Plan** – A plan for managing stormwater runoff on a watershed-wide basis, as required by the Act of October 4, 1978, P.L. 864 (Act 167), as amended, and known as the “Stormwater Management Act.”

**Stormwater Management (SWM) Site Plan** – The plan prepared by a qualified professional indicating how stormwater runoff will be managed at the project site according to this Ordinance.

**Stream** – A watercourse. A channel or conveyance of surface water having defined bed and banks, whether natural or artificial, with perennial or intermittent flow.

**Subwatershed Area** – The smallest drainage unit of a watershed for which stormwater management criteria has been established.

**Subdivision** – The division or redivision of a lot, tract or parcel of land by any means into two or more lots, tracts, parcels or other divisions of land including changes in existing lot lines for the purpose, whether immediate or future, of lease, partition of the court for distribution to heirs or devisees, transfer of ownership or building or lot development; provided, however, that the subdivision by lease of land for agricultural purposes into parcels of more than 10 acres, not involving any new street or easement of access, or any residential dwelling, shall be exempted.

**Surface Waters** – Perennial and intermittent streams, rivers, lakes, reservoirs, ponds, wetlands, springs, natural seeps, and estuaries, excluding water in facilities approved for wastewater treatment such as wastewater treatment impoundments, cooling water ponds and constructed wetlands used as part of a wastewater treatment process.

**Swale** – A low-lying stretch of land that gathers or carries surface water runoff. A watercourse without defined bed and bank.

**Time of Concentration (Tc)** – The time for surface water 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.

**Topography** – A general term that includes the characteristics of the ground surface such as hills, plains, mountains, degree of relief, steepness of slope and physiographic features. The configuration of a surface area showing relative elevations.

**Topsoil** – Acceptable friable loam that is free of subsoil, clay lumps, brush, roots, weeds, other objectionable vegetation, stones, other foreign material larger than 2” in any dimension, litter, and/or other material unsuitable or harmful to plant growth.

**Township** – South Lebanon Township, Lebanon County, Pennsylvania.

**Township Engineer** – A Registered Engineer designated by the Township to perform duties as required by this Ordinance on behalf of South Lebanon Township.

**USDA** – The United States Department of Agriculture.

**Vegetative Cover** – Such cover shall consist of trees, shrubs, flowers, grass, or similar natural cover.

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

**Waters of the Commonwealth** – Rivers, streams, creeks, rivulets, impoundments, ditches, watercourses, storm sewers, lakes, dammed water, wetlands, ponds, springs and other bodies or channels of conveyance of surface and underground water, or parts thereof, whether natural or artificial, within or on the boundaries of the Commonwealth of Pennsylvania.

**Water Pollution** – The addition of pollutants to Waters of the Commonwealth in concentrations or quantities sufficient to result in measurable degradation of water quality.

**Water Quality Volume** – The total volume of water runoff that is required to be collected and treated for water quality control by direction to BMP facilities.

**Water Table** – The upper surface of groundwater, or that level below which the soil is seasonally saturated with water.

**Watershed** – Region or area drained by a river, watercourse, or other surface water, whether natural or artificial. Also synonymous with “sub-watershed” and “drainage area” referring to local drainage area of interest for site specific calculations.

**Wetland** – Those areas that are inundated or saturated by surface or groundwater 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, and similar areas.

## ARTICLE III. STORMWATER MANAGEMENT STANDARDS

### Section 301. General Requirements

- A. For all regulated activities, unless preparation of an SWM Site Plan is specifically exempted in Section 402:
  - 1. Preparation and implementation of an approved SWM Site Plan is required.
  - 2. No regulated activities shall commence until the Township approves a SWM Site Plan, which demonstrates compliance with the requirements of this Ordinance.
- B. SWM Site Plans approved by the Township shall be on site throughout the duration of the regulated activity.
- C. The Township 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.
- D. 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 and the Clean Streams Law. Various BMPs and their design standards are listed in the *PADEP Erosion and Sediment Pollution Control Program Manual*, Technical Guidance No. 363-2134-008 (March 2012), as amended<sup>2</sup>.
- E. Impervious areas:
  - 1. The measurement of impervious areas shall include all the impervious areas in the total proposed development even if development is to take place in stages.
  - 2. For development taking place in stages, the entire development plan must be used in determining conformance with this Ordinance.
  - 3. For projects that add impervious area to a parcel, the total impervious area on the parcel is subject to the requirements of this Ordinance; except that the volume management in Section 303, the water quality controls in Section 304 and the rate controls of Section 305 are not applicable to existing impervious areas that are located beyond the limits of disturbance.
  - 4. Where the site contains existing impervious surfaces, 20% of the existing impervious area to be disturbed must be considered meadow in good condition.
  - 5. Permanent water impoundments (e.g. retention ponds) shall be considered impervious across the entire area of the water impoundment at the normal water surface elevation.
- F. Land Cover Assumptions.
  - 1. When calculating pre-development runoff from areas within the proposed limits of disturbance, existing pervious areas must be considered meadow in good condition

- except wooded areas shall utilize “forest/woodland” or “woods” cover coefficients in good condition.
2. When calculating pre-development runoff from areas outside the proposed limits of disturbance, all runoff coefficients/curve numbers shall be based upon the existing land use covers in good condition. Runoff coefficients and curve numbers shall be selected from the tables in Appendices B-1 and B-2.
  3. The runoff coefficients/curve numbers for post-development drainage areas within the limits of disturbance shall be based on proposed land use cover conditions.
  4. The runoff coefficients/curve numbers for post-development drainage areas outside of the limits of disturbance shall be based on existing land use cover conditions.
- G. Stormwater flows onto adjacent property shall not be created, increased, decreased, relocated, or otherwise altered without written notification to the adjacent property owner(s). Such stormwater flows shall be subject to the requirements of this Ordinance.
- H. All regulated activities shall include such measures as necessary to:
1. Protect health, safety, and property;
  2. Meet the water quality goals of this Ordinance by implementing measures to:
    - a. Minimize disturbance to floodplains, wetlands, and wooded areas.
    - b. Maintain or extend riparian buffers.
    - c. Avoid erosive flow conditions in natural flow pathways.
    - d. Minimize thermal impacts to waters of the Commonwealth.
    - e. Disconnect impervious surfaces by directing runoff to pervious areas, wherever possible.
  3. Incorporate methods described in the Pennsylvania Stormwater Best Management Practices (BMP) Manual<sup>1</sup>. The green infrastructure and low impact development (LID) practices provided in said BMP Manual<sup>1</sup> shall be utilized to the maximum extent practicable.
- I. For all regulated activities, SWM BMPs shall be implemented, operated, and maintained to meet the purposes and requirements of this Ordinance and to meet all requirements under Title 25 of the Pennsylvania Code, the Clean Streams Law, and the Stormwater Management Act.
- J. The design of all stormwater management facilities shall incorporate sound engineering principles and practices.
- K. Stormwater management facilities, located within or discharging to a PennDOT right-of-way, shall be subject to PennDOT approval. Stormwater BMPs shall maintain a ten (10) foot isolation distance from the PennDOT right-of-way.

- L. The 25 Pa. Code 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 other concerns shall be addressed to the DEP, Bureau of Waterways Engineering in Harrisburg. Mailing Address: PA Department of Environmental Protection, Bureau of Waterways Engineering, PO Box 8460, Harrisburg, PA 17105-8460. Site Address: 400 Market Street, 3rd Floor Rachel Carson State Office Building, Harrisburg, PA 17101. When there is a question whether wetlands may be involved, it is the responsibility of the Developer or his agent to show that the land in question cannot be classified as wetlands, otherwise approval to work in wetlands must be obtained from DEP. A wetlands report, prepared by a qualified professional, shall be submitted whenever wetlands are located near or within the project area.
- M. All stormwater runoff flowing over the development site shall be considered in the design of the stormwater management facilities.
- N. 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 the rules and regulations of the 25 Pa. Code Chapter 105.
- O. The design of all stormwater facilities over karst areas shall include an evaluation of measures to minimize adverse effects, such as sinkholes and groundwater contamination. The location of stormwater management facilities and discharges shall avoid sinkhole prone areas, closed depressions, fractured limestone traces and limestone rock outcrops.
- P. Where a development site is traversed by watercourses other than permanent streams, drainage easements shall be provided conforming to the line of such watercourses. The terms of the easement shall prohibit excavation, the placing of fill or structures, and any alterations that may adversely affect the flow of stormwater within any portion of the easement.
- Q. Stormwater BMPs and conveyance facilities that are not located within a street right-of-way shall be centered within an easement not less than twenty (20) feet in width. Easements shall follow property lines where possible and shall be described with metes and bounds descriptions tied to survey control points.

### **Section 302. Stormwater Management Districts**

- A. Lebanon County is divided into stormwater management districts to establish customized control of stormwater runoff based on the applicable watershed's Act 167 Stormwater Management Plan (see Appendix C).
- B. South Lebanon Township includes the following Stormwater Management Districts:
  - 1. Tulpehocken (District A)
  - 2. Cocalico
  - 3. Lebanon County Residual

- C. Post-development rates of runoff from any subdivision, land development or regulated activity shall be reduced to equal or less than the pre-development peak rates of runoff as specified in Section 305.C (Rate Control Requirements).
- D. Additional stormwater management districts may be established as watershed studies are completed. Upon adoption of those watershed plans (i.e., Stormwater Management Plans) by the Lebanon County Commissioners and/or Municipalities and State Agencies, the applicable design criteria within the watershed plans shall be satisfied by developers of the affected land.
- E. If additional stormwater management districts are established and the proposed development site is within two (2) or more stormwater management districts, the design shall be prepared by district so that peak discharge rates for each district shall be satisfied in accordance with part C above. Stormwater runoff should not be transferred from one watershed or sub-watershed to another. If a transfer cannot be avoided, the peak discharge limits of the receiving watershed district shall be satisfied in accordance with part C above.
- F. Where the area to be impacted by a proposed development activity differs significantly from the total lot area, only the area within the limits of disturbance shall be subject to the Stormwater Management District Criteria.

**Section 303. Volume Management**

- A. Provisions for stormwater volume management are required for areas being developed. Where feasible, design of the Stormwater BMPs shall provide ground water recharge to compensate for the reduction in the percolation that occurs when the ground surface is covered by impervious surfaces.
- B. Stormwater BMPs shall manage the post-development net change in runoff volume for storms up to and including the 2-year/24-hour storm event when compared to pre-development conditions. The analysis for the 2-year/24-hour storm event shall be conducted using the following minimum criteria:
  - 1. When the existing site contains impervious area and the existing site conditions have public health, safety or environmental limitations, the applicant may demonstrate to the Township that it is not practicable to satisfy the requirement in Section 301.E.4, but the stormwater volume reduction will be maximized to the extent practicable.
  - 2. Alternative volume management approaches may be proposed by the applicant when the applicant demonstrates to the Township that the alternative will either be more protective than required under Section 303.B or will maintain and protect existing water quality and existing and designated uses by maintaining the site hydrology, water quality, and erosive impacts of the conditions prior to initiation of any earth disturbance activities.
- C. Stormwater volume management shall be applied using DEP's latest guidance and design calculation methodology.
  - 1. DEP has developed a Post-Construction Stormwater Management (PCSM) Microsoft Excel® spreadsheet to facilitate calculations necessary for completing the stormwater analysis required by 25 Pa. Code § 102.8(g) for PCSM Plans, including the required

volume management. Unless the project is exempt from the SWM Site Plan requirements per Section 402, DEP's spreadsheet shall be used for determining the required volume management regardless of the total area of earth disturbance.

2. DEP's PCSM spreadsheet can be downloaded from DEP's website, [www.dep.pa.gov/constructionstormwater](http://www.dep.pa.gov/constructionstormwater). Select "E&S Resources" from the menu.
- D. Infiltration BMPs intended to receive runoff from developed areas shall be selected based on suitability of soils and site conditions and shall be constructed on soils that have the following characteristics:
1. A minimum depth of 24 inches between the bottom of the facility and the seasonal high-water table and/or bedrock (limiting zones).
  2. An infiltration and/or percolation rate sufficient to accept the additional stormwater load and drain completely as determined by field tests conducted by the developer's/landowner's professional designer.
    - a. The recharge volume provided at the site shall be directed to the most permeable hydrologic soil group (HSG) available.
    - b. The recharge facility shall be capable of completely infiltrating the impounded water within 72 hours after any storm event.
- E. A detailed soils and geological evaluation of the project site shall be performed to determine the suitability of recharge facilities. The evaluation shall be performed by a qualified professional, and at a minimum, address soil permeability, depth to bedrock, susceptibility to sinkhole formation, and subgrade stability. The general process for designing the infiltration BMP shall be:
1. Analyze hydrologic soil groups as well as natural and man-made features within watershed to determine general areas of suitability for infiltration practices.
  2. Provide field test(s) to determine appropriate percolation rate and/or hydraulic conductivity.
  3. Design infiltration BMP for required storm volume based on field-determined capacity at the level of the proposed infiltration surface.
  4. Extreme caution shall be exercised where infiltration is proposed in geologically susceptible areas such as limestone areas.
  5. Extreme caution shall also be exercised where salt or chloride would be a pollutant since soils do little to filter this pollutant and it may contaminate the groundwater.
  6. The design professional shall evaluate the possibility of groundwater contamination from the proposed infiltration/recharge facility. The Township may require the developer to provide safeguards against groundwater contamination for uses that may cause groundwater contamination, should there be a mishap or spill.

7. Whenever a SWM BMP will be located in an area underlain by limestone, a geological evaluation of the proposed location shall be conducted to determine susceptibility to sinkhole formations.
  8. The design of all SWM BMPs over limestone formations shall include measures to prevent instability resulting from sinkhole formation. The Township may require the installation of an impermeable liner in SWM basins.
  9. The Township may require a detailed hydrogeologic investigation.
  10. The following note shall be attached to all SWM Site Plans: "The proposed stormwater management BMP(s) (circle one) is/are (or is/are not) underlain by limestone."
- F. If the developer's professional consultant can prove through analysis that the development site is located in an area underlain by carbonate geology, and such geologic conditions would likely result in sinkhole formations, then the site may be exempted from groundwater recharge requirements. However, the development site shall be required to meet all other hydrologic and water quality management standards as mandated by this Ordinance.
  - G. Where pervious pavement is proposed for parking lots, recreational facilities, non-dedicated streets, or other areas, pavement construction specifications shall be noted on the plan.
  - H. Recharge/infiltration facilities may be used in conjunction with other innovative or traditional BMPs, stormwater control facilities, and nonstructural stormwater management alternatives.

**Section 304. Water Quality Requirements**

- A. Stormwater BMPs shall manage the post-development net change in pollutant loads, including total suspended solids, total phosphorus, and total nitrogen, for storms up to and including the 2-year/24-hour storm event when compared to pre-development conditions. The analysis for the 2-year/24-hour storm event shall be conducted using the following minimum criteria:
  1. When the existing site contains impervious area and the existing site conditions have public health, safety or environmental limitations, the applicant may demonstrate to the Township that it is not practicable to satisfy the requirement in Section 301.E.4, but the water quality treatment will be maximized to the extent practicable.
  2. Alternative water quality treatment approaches may be proposed by the applicant when the applicant demonstrates to the Township that the alternative will either be more protective than required under Section 304.A or will maintain and protect existing water quality and existing and designated uses by maintaining the site hydrology, water quality, and erosive impacts of the conditions prior to initiation of any earth disturbance activities.
- B. Stormwater pollutant load reduction requirements and BMP water quality credits shall be applied using DEP's latest guidance and design calculation methodology. The DEP PCSM Microsoft Excel® spreadsheet described in Section 303.C.1 shall be used for determining

the pollutant load reduction requirements and BMP water quality credits regardless of the total area of earth disturbance

**Section 305. Rate Control Requirements**

- A. Calculations shall include pre-development and post-development peak runoff rates from the development site for all drainage areas.
- B. South Lebanon Township has been divided into stormwater management districts as shown on the Watershed Map in Appendix C. Within each Stormwater Management District, post-development runoff from a development site shall be controlled to the corresponding pre-development runoff rate. Runoff calculations for the pre- and post- development peak flow comparisons shall evaluate all stormwater events listed in the applicable table from Section 305.C below.
- C. Stormwater management shall be provided such that post-development peak flows for each drainage area within the project limits are reduced to equal or less than the pre-development peak flows for the appropriate stormwater management district according to the following table:

Post-Dev. Design Storm Frequency in Years	Pre-Development Design Storm (Frequency in Years)		
	Tulpehocken District A	Cocalico District	Lebanon County Residual District
2	1	Post-development shall be 50% or less of the pre- development rate for all storm events	1
5	5		2
10	10		5
25	25		25
100	100		100

- D. Off-site Areas that drain through a proposed development site are not subject to release rate criteria when determining allowable peak runoff rates. However, on-site drainage facilities shall be designed to safely convey off-site flows through the development site for the 100-year event.
- E. Design of stormwater facilities shall be verified by routing the storm event hydrographs through the facilities using the Storage Indication Method. Routings of Rational Method hydrographs shall determine the critical duration corresponding to the highest peak water surface elevation in the detention facility based on extended runoff inflows for each control storm event or consist of a methodology approved by the Township Engineer. The combination of Rational Method hydrographs based on timing is prohibited.
- 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.

**Section 306. Calculation Methodology**

- A. Stormwater runoff calculations for all development sites and regulated activities shall be calculated in accordance with the following computation methodologies. Selection of the

method of calculation by the design professional shall be based upon the limitations and suitability of each method for the development site. The Township Engineer should be consulted for method alternatives and applicability.

1. Rational Method.

- a. NOAA ATLAS 14 Point Precipitation Frequency Estimates shall be used to determine appropriate precipitation intensities.

[https://hdsc.nws.noaa.gov/hdsc/pfds/pfds\\_map\\_cont.html](https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html)

- b. Where hydrographs are produced using the Rational Method, the provided storage volume shall be verified with a critical duration analysis that investigates similar storm occurrences with extended durations and applicable intensities to determine the anticipated maximum elevation to occur in the storage facility for each required storm event.
- c. This method is acceptable for calculating peak flows to stormwater conveyance facilities and for use in the design of small detention/retention facilities on individual residential lots (see Storm Event Criteria below).
- d. Recommended for watersheds < 10 acres

2. Soil Cover Complex Method.

- a. The Soil Conservation Service Type II, 24-hour rainfall distribution shall be used in conjunction with the rainfall depths from NOAA Atlas 14 or consistent with the following table:

Design Storm Frequency	Inches of Rainfall
1 Year	2.5
2 Year	3.1
5 Year	3.9
10 Year	4.6
25 Year	5.6
50 Year	6.6
100 Year	7.6

Source: NOAA Atlas 14, Volume 2, Version 3

- c. This method is acceptable for all watersheds and for use in calculating flows to retention and detention facilities where a 24-hour rainfall distribution is necessary.
  - d. Preferred for watersheds > 10 acres
3. TR-20, USDA Soil Conservation Service. This method is acceptable for all watersheds, especially where a full hydrologic computer model is desired.
4. HEC-1 U.S. Army Corps of Engineers. This method is acceptable for all watersheds, especially where a full hydrologic computer model is desired.

- B. Pre- and post-development time-of-concentration flow paths shall be delineated on drainage area mapping with the end and beginning of segments clearly identified as well as the lengths and corresponding end elevations used for each segment. The post-development time-of-concentration shall never be greater than the pre-development time-of-concentration for any watershed or subwatershed. Times of concentration shall be based upon the following:
1. The maximum length of overland sheet flow shall be one hundred (100) feet before shallow concentrated or open channel flow develops and shall be justified using the methodology presented in Chapter 3 of the NRCS Technical Release 55 (TR-55) to include the following. For pre-development conditions, the sheet flow Manning's n value of 0.24 (dense grasses), 0.40 (woods light underbrush) and 0.80 (woods dense underbrush) shall be used. For post development sheet flow over proposed mowed areas the Manning's n value shall be 0.15. All other Manning's n assignments shall follow generally accepted standards.
  2. Travel time for shallow concentrated flows shall utilize the NRCS Methodology using the Velocity Factor  $K_v$  (NEH-4 Figure 15.2) in feet/sec.; 20.3 (paved), 16.1 (unpaved), 15.0 (grassed waterway), 7.0 (short grass), 5.0 (woodland) and 2.5 (woodland with heavy litter).

The travel time is calculated as  $T_t = L/V$  and  $V = K_v * S^{1/2}$

Where  $T_t$  = travel time (sec),  $L$  = length (ft),  $V$  = Velocity (ft/sec),  $K_v$  = applicable factor, and  $S$  = path slope (ft/ft).

3. Overland flows which are concentrated within field depressions, swales, gutters, curbs or pipe collection systems shall be designed using Manning's Equation for time of concentration criteria for open channel conditions between these design points using acceptable Manning's n values.

### **Section 307. Best Management Practices (BMPs)**

#### **A. Goals and Objectives.**

1. Preserve existing natural features, especially those which store, infiltrate, or filter water runoff.
2. Infiltrate rainfall to recharge the ground water table.
3. Minimization of impervious surfaces and infiltration of runoff through seepage beds, infiltration trenches, rain gardens, etc. are encouraged, where soil conditions permit, to reduce the size or eliminate the need for detention facilities.
4. Use physical (structural) and biological or vegetative (non-structural) filtration of water runoff to reduce pollutants and remove sediment.
5. Moderate water runoff velocities to minimize erosion and damage to downstream aquatic habitat.
6. Integrate BMPs into the site layout to perform a water quality function and compliment the developed use of the site.

7. Enhance site aesthetics using a variety of BMP techniques and components.
8. Maximize collection and treatment of small storm event (first flush) stormwater runoff which contains the highest concentration of pollutants.
9. Utilize a system of BMP facilities and ground water recharge devices throughout the site.

B. General Standards.

1. Various BMPs and their design standards are listed in the Pennsylvania Stormwater Best Management Practices (BMP) Manual<sup>1</sup>.
2. A variety of methods for stormwater detention and retention are available for use. These include surface detention, subsurface detention, use of existing facilities (ponds, etc.) or a combination thereof. Subsurface detention shall be utilized only where the subsurface is stable, the area is not prone to sinkhole formation, and all underground pipes are sealed to prevent leaks.
3. Water quality shall be maintained through the requirement for BMP design components for all subdivisions, land developments and regulated activities within South Lebanon Township, except where other provisions of this Ordinance provide for plan or stormwater design exemptions. Also exempted are minor subdivisions such as lot additions, lot revisions, division of existing buildings and other plans where no new construction or development is proposed. Revision or expansion projects requiring land development approval with stormwater design shall include measures to retrofit the site with BMPs to maintain or improve the water quality of the stormwater discharges.
4. The required Volume Management, specified in Section 303, shall be conveyed to BMPs for all areas of the site to be developed.
5. Site designs shall minimize earth disturbance and the generation of stormwater runoff while maximizing pervious areas for treatment of stormwater.
6. All BMPs shall be sized to capture the required control volume, designed according to the BMP criteria within this Ordinance, constructed properly and maintained regularly.
7. Stormwater runoff which is directly discharged to wetlands, streams, ponds, High Quality or Exceptional Value Watersheds or which originates from land uses or activities with higher potential for pollutant loadings (such as auto salvage yards, vehicle service areas, loading/unloading areas, truck centers, etc.) may require the use of additional or specific structural BMPs for pollution prevention and maintenance of water temperatures and quality.
8. Place BMPs near the source of stormwater runoff and treat runoff from impervious surfaces before mixing with runoff from less contaminated sources.
9. Use native vegetation and water tolerant plants. Trees and shrubs shall not be planted on stormwater facility embankments or in other areas where roots may endanger pipes, headwalls, endwalls, spillway structures or other structural facilities.

10. Impervious area runoff shall be directed to BMPs to the extent practicable. The Volume Control shall be provided within each watershed or sub watershed to provide the intended treatment for upstream runoff. Volume Control credit will not be allowed toward non-contributing runoff areas.
11. BMP categories used within these regulations include Ponds, Wetlands, Infiltration Systems, Filtering Systems and Open Channels. The Design Criteria Subsection listed hereafter provides specific descriptions of the BMPs within these classifications. Where effectiveness can be demonstrated, alternative BMP designs and concepts may be utilized.
12. Site designs shall include measures to reduce stormwater velocities and collect sediment near the source of the water runoff so that BMPs can be effective in treating water quality and maintenance can be reduced. Recommended facilities are forebays, energy dissipators, outlet stabilization structures, inlet protection devices, level spreaders, and flow splitters.
13. Highly permeable soils may require installation of a clay, bentonite, or poly liner where water retention is designed, such as with ponds and wetlands.
14. Carbonate geology (limestone) areas require careful evaluation for appropriate BMP design. Facility depths should be minimized, and liners may be required.
15. Forebays and micropools are recommended for ponds and required for wetlands. Forebays and micropools should each contain approximately ten (10) percent of the required water volume. Forebays should be at least ten (10) feet long and be baffled from the main basin with a berm of rip rap or similar material, to a depth of one (1) foot below the water quality volume level, to insure an indirect flow path. Additionally, when forebays are used, a minimum of ninety (90) percent of the discharge into the facility shall be directed into the forebays.
16. All ponds and wetlands shall be surrounded by a riparian buffer strip of a minimum twenty-five (25) feet in width. Streams shall be bordered by a riparian buffer strip, a minimum of twenty-five (25) feet or the width of the flood plain, whichever is greater.
17. Planting of wetland plants is required within created wetlands and encouraged in ponds and other applicable BMPs. Fringe wetland plants may be used on aquatic benches or within shallow pools, while emergent wetlands vegetation should be planted alongside slopes and facility edges.
18. Infiltration BMPs 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.
19. Normally dry, open top, storage facilities should completely drain both the volume control and rate control capacities over a period not less than 24 and not more than 72 hours from the end of the design storm.
20. Infiltration, filtering, or other BMP systems which are designed to treat the required control volume from small storms shall be preceded by a flow splitter or equivalent bypass device to route larger water volumes around the system.

21. All underground stone and sand BMP systems shall be lined with geotextile fabric on the sides, bottom and top, (double layer on top) have a level (flat) bottom, be underlain by a minimum of two (2) feet of soil or sand above the seasonal high-water table and be placed a minimum of ten (10) feet horizontally from building foundation walls.
22. Stone infiltration systems shall utilize AASHTO #1 (clean 4-inch) or AASHTO #3 (clean 3-inch) stone and assume a maximum of forty (40) percent voids volume.
23. Grass swales should be designed with a flat channel bottom at least two (2) feet in width, with a longitudinal slope of one (1) to two (2) percent. If grass swale slopes exceed four (4) percent, check dams or similar water velocity modifiers should be used.

C. Design Criteria.

1. The following site factors should be considered in selecting and designing the appropriate BMPs:
  - a. Total contributing area.
  - b. Permeability and infiltration rate of the site soils.
  - c. Slope and depth to bedrock.
  - d. Seasonal high-water table.
  - e. Proximity to building foundations and well heads.
  - f. Erodibility of soils.
  - g. Land availability and configuration of the topography.
2. The following factors should be evaluated when determining the suitability of BMPs for a development site:
  - a. Peak discharge and required volume management.
  - b. Stream bank erosion.
  - c. Efficiency of the BMPs to mitigate potential water quality problems.
  - d. The volume of runoff that will be effectively treated.
  - e. The nature of the pollutant being removed.
  - f. Maintenance requirements.
  - g. Creation/protection of aquatic and wildlife habitat.
  - h. Recreational value.
  - i. Enhancement of aesthetic and property value.

D. Examples.

1. The following surface detention and retention BMPs provide enhanced water quality benefits compared to conventional detention basins. These BMPs usually contain a pool of water to perform the BMP function of capturing pollutants to improve the water quality of the discharge. Examples of surface detention and retention BMPs include:

- a. Wet Retention Pond

A permanent pool of standing water, normally containing a perimeter aquatic bench of 6" to 18" in depth, where pollutants are removed through sedimentation and plant absorption.

- b. Extended Detention Pond

A basin designed to temporarily hold stormwater for an extended period to facilitate physical settling of pollutants. These facilities may be normally dry, contain a shallow marsh, have a small wetpool, and often contain a combination of these features. Extended detention ponds usually include a vegetated forebay that is baffled from the main basin with a rip rap mound, a small sized outlet for the water quality storm discharge, a primary outlet for large storm events and a benched basin for varying water depths.

- c. Multiple Pond

A pond system containing a series of two (2) or more pools or cells to create a longer pollutant removal pathway.

- d. Rain Garden

An excavated shallow (maximum ponding depth of 12") surface depression planted with specially selected native vegetation to treat and capture runoff.

2. Wetlands may be constructed to contain an environment of shallow marsh where pollutants can be removed through a combination of settling, absorption, retention, plant uptake and biological decomposition. Wetland designs are best suited for larger watersheds and must be accompanied by a landscaping plan which specifies plant species, planting arrangement, bed preparation and operation/maintenance requirements. Additionally, wetlands shall be planted with three (3) or more plant species for diversity and survival, plus at least fifty (50) percent of the wetland area must be planted and maintained in plant cover. Specific wetland types include:

- a. Shallow Wetlands

These systems are configured with several varying levels of marsh areas, containing a meandering water pathway from the forebay to a micropool at the outlet. Water depths usually range from 6" to 18".

- b. Pocket Wetlands

Wetlands for small locations where a seasonal high-water table is needed to help sustain the water elevations.

3. Infiltration systems are designed to capture stormwater runoff and infiltrate it into the ground. These systems are best adapted for small drainage areas and effectively reduce runoff volume, remove many pollutants, recharge the groundwater, and contribute to maintaining stream baseflows. Examples of infiltration systems include:

- a. Infiltration Trench.

Shallow excavations that are lined with geotextile fabric and filled with stone to create an underground water reservoir, which gradually percolates into the surrounding subsoil. Infiltration trenches are especially useful for connection to roof drains. Larger trenches will require an under drain to a stormwater conveyance system.

- b. Infiltration Basin.

A large, open depression (basin), which collects stormwater for percolation. The basin surface should be vegetated with deep rooted plants to enhance infiltration. Soils, slope, geology, and hydrogeology may restrict use of these basins.

- c. Porous Pavement.

Low traffic or overflow parking areas may be designed with porous pavement, a porous asphalt layer which permits runoff to drain into an underground stone area where it can infiltrate into the subsoil.

- d. Depressed Pervious Area.

These facilities are useful for capturing runoff within a parking lot island. They are designed lower than the surrounding areas, contain permeable soils with a filtration system or a beehive drain and often contain an underdrain for excess runoff. Plants, shrubs, and trees enhance performance and aesthetics. Contributing parking areas require curb cuts, curbs with weep holes or similar design to facilitate runoff discharge to the pervious area.

4. Filtering systems are effective for filtering sediment and other pollutants from runoff by passing it through sand, soil, sand/soil mix, vegetation, a structural filter, or any combination thereof. Filtered runoff is then infiltrated or drained to other on-site facilities. These systems may be integrated into landscaped areas and parking islands where plantings will add aesthetic enhancements. Examples of filtering systems include:

- a. Sand Filter.

An underground chamber or bed with sand designed to filter pollutants as water drains through it, with an underdrain system for discharge of the filtered water to a stormwater conveyance system.

- b. Bioretention System.

These designs utilize a mixture of sand and permeable soil underneath a planted, landscaped depression to collect and treat surface water runoff. Bioretention areas are especially advantageous for parking lot islands and snow storage locations.

c. Riparian Buffer Strip.

Along streams, wetlands and ponds, an area of land which is vegetated with a combination of trees, shrubs, and herbaceous plants. This land strip is designed to protect the water resource by filtering pollutants, improving the habitat, and cooling the waterways by shading. The riparian buffer strip shall include the 100-year flood plain or be a minimum of twenty-five (25) feet wide from the edge of the normal water level, whichever is greater.

d. Vegetated Filter Strip.

These BMPs are characterized by grass or low growing vegetation on a uniformly sloped area which is designed to intercept sheet flow water runoff between an impervious surface and the stormwater conveyance facilities. Vegetated filter strips reduce water velocities and trap sediment and pollutants. They require good vegetation and soil permeability and should be avoided on steep slopes. They are best used along small parking lots, should be a minimum of twenty (20) feet wide in the direction of water flow, and normally are designed equal in size to the impervious area draining to the filter strip.

e. Vegetated Swale.

A broad, shallow, low gradient swale with a dense stand of medium height vegetation, which is designed to trap pollutants and promote infiltration.

f. Water Quality Inlet.

Underground boxlike structure, such as an oil/grit separator, which is used to remove sediment and hydrocarbons from water runoff originating from parking lots and heavy traffic areas with the potential for petroleum discharges. These facilities are used close to the source of the runoff and currently include other products such as Stormceptor and Terre Kleen™.

5. Open channels convey, filter and percolate stormwater runoff. They are often used as an alternative to, or component of, a storm sewer system. Types of open channels include:

a. Vegetated Channel.

Vegetated channels (e.g. grass) filter pollutants as stormwater runoff is drained to other areas. These facilities are best combined with other BMPs and may include check dams or minor depression storage to reduce water velocity and encourage infiltration. An underbedding of mixed sand and soil with a pipe or stone underdrain will improve the use for infiltration and ground water recharge.

b. Lined Channel.

Rip rap, concrete or other erosion resistant material may be used to line a channel to prevent scouring and degradation of a water carrying channel.

6. Additional Information.

The information, guidelines and requirements of this Section of this Ordinance are intended to provide guidance in the design, construction, operation, and maintenance of BMPs to protect water quality throughout South Lebanon Township. It is recognized that BMP technology is relatively new and subject to continuing modifications and improvements. As such these regulations provide for considerable design flexibility, provided the design is consistent with the standards listed in this Ordinance.

Additionally, it is further intended that comprehensive handbooks and design manuals for BMPs shall be utilized and relied upon for guidance. Recommended sources of information are as follows:

- a. Pennsylvania Department of Environmental Protection, Pennsylvania Stormwater Best Management Practices Manual, Technical Guidance No. 363-0300-002, December 30, 2006, as amended.
- b. Maryland Department of the Environment, 2000 Maryland Stormwater Design Manual, Volumes I and II, as amended.
- c. Minnesota Pollution Control Agency, Protecting Water Quality in Urban Areas, March 1, 2000, as amended.
- d. Pennsylvania Department of Environmental Protection, Erosion and Sediment Pollution Control Program Manual, Technical Guidance No. 363-2134-008, March 2012, as amended.

**Section 308. Retention and Detention Basins**

- A. The criteria for design and construction of stormwater basins are not the same criteria that are used in the permitting of dams under the 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 25 Pa. Code Chapter 105. Depending on the physical characteristics of a dam, the design could require that anywhere from a 100-year to a Probable Maximum Flood (PMF) storm event be considered.
- B. Maximum water depth shall not exceed six (6) feet.
- C. The minimum top width of basin embankments shall be five (5) feet for basins with drainage areas five (5) acres or less and eight (8) feet minimum width for basins with drainage areas exceeding five (5) acres.
- D. The side slopes of earth fill embankments shall not be steeper than three (3) horizontal to one (1) vertical on both sides of the embankment. However, the interior side slopes of the impoundment area shall have side slopes of five (5) horizontal to one (1) vertical or flatter unless access to the basin is restricted by fencing designed to prevent access. In no case shall the interior side slopes of the impoundment area be steeper than three (3) horizontal to one (1) vertical.
- E. Basins shall be provided with a minimum four (4) inches of topsoil and shall be seeded and mulched except for the impoundment area of wet ponds. All areas to receive topsoil should be scarified 12 inches deep before topsoil placement.

- F. All basins shall be structurally sound and shall be constructed of sound and durable materials. The completed structure and the foundation of all basins shall be stable under all probable conditions of operation. Soils used for the construction of basins shall have low erodibility factors where K factor  $\leq 0.37$ .
- G. The minimum slope of any detention basin bottom surface shall be two percent (2%) positive grade toward the outlet, along all flow paths except those basins specifically designed to infiltrate stormwater.
- H. A cutoff or key trench of impervious material shall be provided under all basin berms.
- I. Concrete, polyethylene, or welded galvanized steel anti-seep collars compatible with the discharge pipe shall be placed around all basin discharge pipes to increase the seepage length along the pipe by 15% within the saturated zone of the pipe based on a 4:1 phreatic line. The connection of the anti-seep collar to the discharge pipe shall be completely watertight.
- J. Principal outlet structures shall consist of stainless-steel orifice plates (and mounting hardware), galvanized or reinforced concrete riser and discharge pipe, and welded structural steel inlet grates (with a bituminous coating). Smooth lined corrugated polyethylene pipe may be used for discharge pipes. The use of PVC pipe is prohibited for basin discharge pipes except for small applications such as rain gardens. Discharge pipes shall conform to the requirements of Section 309. Principle outlet structures with riser pipes where the designed water depth is deeper than 0.4 times the diameter of the riser, shall have an anti-vortex device to prevent reduced capacity of the riser.

(Example, if the top elevation of an 18-inch riser is 100.00, the riser shall have an anti-vortex device if the water elevation is higher than  $100.00 + [(18 * 0.4)/12] = 100.60$ ). Materials used for design shall be specified on the plans.

- K. All pipes and culverts through dams shall have properly spaced cutoff collars or anti-seep collars.
- L. The minimum finished floor elevations for all structures immediately adjacent to a basin shall be two (2) feet above the 100-year water surface elevation. Basements are prohibited unless properly waterproofed.
- M. An earthen emergency spillway shall be provided to pass the peak flow rate of the incoming one hundred (100) year storm with one (1) foot of freeboard between the maximum pool elevation and the top of the embankment. The emergency spillway shall be stable under the 100-year peak flow and shall not create a downstream hazard. The maximum pool elevation through the emergency spillway shall be calculated using the weir equation while ignoring the basin's storage volume and discharge through principal outlet. The emergency spillway should not be constructed on fill embankments unless unavoidable. Downstream drainage easements from the emergency spillway may be required.
- N. Rain gardens with a maximum water depth of 12 inches shall not require an emergency spillway. However, conveyance of the 100-year peak discharge through the rain garden's principal outlet structure shall be conveyed in a stable condition.

- O. All basins shall be designed with integrated dewatering apparatuses for emergencies and maintenance. Backup underdrain systems with shut-off valves shall be provided for all detention and infiltration basins. Detention basins not intended for infiltration shall be designed to completely dewater within twenty-four (24) hours following the end of the design rainfall. However, basins designed for infiltration shall fully dewater in less than seventy-two (72) hours.
- P. Basin discharges to proposed or existing conveyance systems shall require evidence of adequate capacity in the receiving conveyance system.
- Q. In areas of carbonate geology, retention and detention basins shall:
  - 1. Be placed at least one hundred (100) feet from the rim of any sinkhole or closed depression; and
  - 2. Be placed a minimum of twenty-five (25) feet from rock outcroppings or pinnacles; and
  - 3. Not discharge into a sinkhole; and
  - 4. Be designed and located to prevent ground water contamination and sinkhole formation, including the use of impermeable liners where deemed necessary to avoid or abate such problems. The construction of clay liners shall conform to the minimum requirements included in Appendix B-5.
  - 5. Be constructed under the supervision of a professional engineer or professional geologist licensed by the Commonwealth.
- R. Basins shall not be divided by property lines.
- S. Vertical risers, inlets, orifices, and other surface water receiving structures shall be installed with trash racks.

### **Section 309. Stormwater Conveyance Facilities**

- A. General Standards.
  - 1. Stormwater runoff from a development site shall flow directly into a natural watercourse, existing channel, storm sewer system or onto adjacent properties in a similar manner to the pre-development flow characteristics.
    - a. The concentrated discharge of stormwater onto adjacent property shall be within a natural watercourse, existing channel, or storm sewer system.
    - b. All discharges must be to stable areas or conveyances. If the existing waterway or drainage system is not stable, a design must be proposed that when implemented, will ensure a stable conveyance.
    - c. Downstream easements may be required to provide drainage paths for concentrated discharge.

2. Storm sewer pipes, culverts, manholes, inlets, endwalls, end sections, and other stormwater management facilities shall be designed and constructed in accordance with the requirements of the PennDOT Publication 13 (Design Manual Part 2 Highway Design), as amended, unless specifications are otherwise provided herein. Structures and their installation within or directly connected to existing or intended public rights-of-way shall conform to the current PennDOT Publication #72M, (Standards for Roadway Construction), as amended.
3. All storm sewer pipes, culverts, channels, gutters, and other water carrying facilities shall be designed to convey the 25-year storm event unless in the opinion of the Township Engineer the character of development and potential for damage warrant design for the 50 or 100-year storm or a different design storm is specified elsewhere in this Ordinance.
  - a. Runoff from the 100-year storm event shall be safely conveyed across the site to stormwater management facilities. Acceptable hydraulic elevations shall be verified for all drainage systems located near buildings and other structures.
  - b. Drainage facilities that convey off-site water through the site shall be designed to convey the 100-year storm event.
  - c. Drainage facilities that convey discharges from detention or retention facilities shall be designed to convey the 100-year storm event.

B. Pipes.

1. Pipe trenching and backfilling shall be in accordance with the requirements of the PennDOT Publication 408 (Specifications) and Publication #72M, (Standards for Roadway Construction), as amended, unless manufacturer's specifications and the Township Engineer authorize alternative procedures. The only accepted backfill material within the Township's rights-of-way between the bottom of pavement's base course and top of pipe bedding shall be compacted 2A coarse aggregate.
2. Pipes proposed for dedication to the Township shall have a minimum diameter of eighteen (18) inches. Fifteen (15) inch diameter drainage pipes may be allowed at the discretion of the Township Engineer.
3. All pipes shall be smooth lined corrugated polyethylene pipe (SLCPP) or reinforced concrete pipe (RCP) and shall conform to PennDOT Publication 408 (Specifications), as amended.
4. Pipes shall be constructed and set to line and grade as shown on approved drawings. All pipes shall be laid on straight runs between drainage structures.
5. Pipes shall be provided with a minimum of twelve (12) inches of cover from the top of pipe barrel to bottom of pavement base course. In unpaved areas, one (1) foot of cover is required to the finished grade.
6. All pipe outlets shall discharge stormwater flows to natural or manmade waterways and shall be provided with an erosion resistant material or energy dissipators to calm

the anticipated velocity and discharge of stormwater. Flow velocities exiting any drainage pipe shall not result in a degradation of the receiving channel.

7. Underdrains, pavement base drains, or combination storm sewer and underdrains shall be provided at low points, cut sections, poorly drained areas, and other areas which, in the opinion of the Township Engineer, are required to provide adequate subsurface drainage to protect the integrity of the street.
  8. All storm sewers which cross a street shall be perpendicular to the street centerline or within thirty degrees (30°) of perpendicular. Vertical and horizontal isolation conflicts with other utilities shall be avoided. Storm sewers within a street shall not cross underneath a curb, especially at curb radii locations.
  9. Culvert design shall investigate, at a minimum, inlet, barrel, and outlet control conditions.
- C. Inlets, Manholes and Endwalls.
1. Precast concrete stormwater inlets shall be used.
    - a. Storm water inlets shall be manufactured as per the latest version of the Commonwealth of Pennsylvania, Department of Transportation, Specifications, Publication 408, Section 714 and the latest version Commonwealth of Pennsylvania, Department of Transportation, Bureau of Highway Design, Standards for Roadway Construction, RC- 46M.
    - b. Grade all adjustment Rings shall be cast in place or conform to current specifications as detailed in PennDOT Publication 72, RC-45M. The alternate use of cast in place adjustment rings shall be approved by the Township Road Foreman.
    - c. Blendcrete non-shrinking grout, or equal shall be used to grout all pipes protruding from structure, grout to be placed inside and outside of structure.
  2. Type “C” inlets with 10” hoods that provide a 2” sump condition may be used with approval from the Township Engineer.
  3. The maximum allowable spread of water shall be one-half (1/2) of a through travel lane.
  4. Design calculations are required to document the capacity and spacing. Inlets shall be analyzed for collection efficiency and bypass flows from upstream structures shall be accounted for in inlet spacing design. The efficiency of storm inlets shall be supported with calculations based on the FHWA HEC-22.
  5. Yard inlets and other non-dedicated inlets may be designed with alternative components, subject to Township Engineer approval.
  6. All inlets over four (4) feet in depth shall be provided with steps for accessibility. Inlets shall be placed along the curb line, gutter line, or edge of paving.

7. All inlets in paved areas shall have bicycle safe grates.
8. All inlets shall be constructed with concrete flow channels cast in-place in the bottom of each inlet, except the last two inlets before a storm sewer outfall shall be constructed with a minimum 12" deep sump to catch debris. Inlet sumps shall have weepholes.
9. All new inlet tops located in Township right-of-way must be marked with high performance preformed thermoplastic markings. Two-layer combination with blue/white contrast. Bottom thermoplastic is blue with top layer white. Markings shall read "NO DUMPING!" on first line and "INTO STORM DRAIN" on second line. Specify Pre-mark® PLUS storm drain marking, or equal. Size shall be twenty-nine (29) inches by five (5) inches.
10. Street inlets shall not be placed directly in front of driveways.
11. Inlets and manholes shall not be spaced more than four hundred (400) feet apart.
12. Manholes or inlets are required at all points of horizontal or vertical deflection.
13. Endwalls or end sections conforming to PennDOT Publication #72M (Standards for Roadway Construction), as amended, are required where stormwater flows enter or leave drainage pipes and culverts.
14. All endwalls and flared end sections with pipes of 12-inch or greater diameter shall be protected from child entry by placing removable stainless-steel bars (and compatible mounting hardware) spaced four inches (4") apart across the opening.

#### D. Channels.

1. Channels shall be designed in accordance with the requirements of Chapter 6 of the *PADEP Erosion and Sediment Pollution Control Program Manual*, Technical Guidance No. 363-2134-008 (March 2012), as amended<sup>2</sup>, except that the design storm shall be in accordance with Subsection A.3 above.
2. Appropriate channel linings shall be selected based on design flows, soil characteristics and permissible velocities and/or unit shear stresses. Channels with bare soils are not permissible.
3. Channels shall be designed using Manning's Equation to insure adequate capacity, control of velocity and swale stability. Vegetated channels shall be designed based upon accepted "n" factors for the anticipated degree of vegetative retardance. The "n" factors to be used for paved or rip-rap channels or gutters shall be based upon accepted engineering design practices as approved by the Township Engineer.
4. Channel side slopes shall be 2:1 minimum. Side slopes for vegetated channels which will be mowed shall be 3:1 minimum.
5. All vegetated channels shall have a minimum longitudinal slope of one (1) percent unless approved by the Township Engineer.

6. Channels shall be designed with six (6) inches of freeboard above the twenty-five (25) year storm depth.

### **Section 310. Streets**

- A. Streets shall be designed to provide for the discharge of surface water from their rights-of-way.
- B. Cross slope of proposed streets' crown shall be two percent (2%). Longitudinal slope of the street's centerline and gutters shall be at least one percent (1%). On curbed streets, the right-of-way beyond the curb line shall be sloped toward the street at two percent (2%).
- C. Adequate facilities shall be provided at low points along streets and where necessary to intercept runoff.
- D. Drainage pipes, channels, roof drains, and sump pumps shall not discharge directly onto a public street right-of-way.
- E. For the 25-year storm, the maximum allowable spread of water on proposed streets shall be one-half (1/2) of a travel lane or one (1) inch less than the curb depth, whichever is less.
- F. Streets shall be designed so that stormwater flow is not diverted onto driveways.
- G. Stormwater flow across street intersections shall not exceed one (1) inch depth for the 25-year storm.

### **Section 311. Erosion and Sediment Pollution Control Requirements**

All subdivision, land development and SWM Site plans which propose earthmoving activity shall include erosion and sediment pollution control design to satisfy the requirements of 25 Pa. Code Chapters 92a and 102 and the PA Clean Streams Law (35 P.S., § 691.1 et seq.) and to prevent soil erosion, sediment, and other pollutants from entering streams, lakes, and neighboring properties. In order to demonstrate and maintain compliance with erosion and sediment pollution control requirements, subdividers and land developers shall:

- A. Prior to earthmoving or subdivision/land development plan approval, obtain Erosion and Sediment Pollution Control design approval from the Lebanon County Conservation District.
- B. Where applicable, obtain NPDES permit approval through the Lebanon County Conservation District and/or DEP and maintain plans and permits on-site.
- C. Install required erosion and sediment pollution control facilities prior to the start of construction and maintain said facilities during the construction period.
- D. Preserve and protect natural vegetation where possible.
- E. Adhere to approved erosion and sediment pollution control design requirements and NPDES standards.

- F. Inspect weekly and after each runoff event and maintain all erosion and sediment pollution control facilities to insure their effectiveness. Accumulated sediment shall be promptly removed, and disturbed areas shall be reseeded or stabilized.
- G. Design, install and maintain facilities in accordance with the *PADEP Erosion and Sediment Pollution Control Program Manual*, Technical Guidance No. 363-2134-008 (March 2012), as amended<sup>2</sup>.
- H. Include standard erosion and sediment control notes on all plans, as per the list within Appendix F.
- I. Be subject to penalties for noncompliance, in accordance with Article IX provisions.
- J. Construction of temporary roadways (for utility construction, timber harvesting, etc.) shall comply with all applicable standards for erosion and sediment pollution control and stream crossing regulations under 25 Pa. Code Chapters 102 and 105. The erosion and sediment pollution control plan shall be submitted to the Lebanon County Conservation District for approval and shall address the following, as applicable:
  - 1. Design of roadway systems, including all 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, reseeded, and other stabilization techniques as required.
- K. Additional erosion and sediment control design standards and criteria that must be applied where infiltration BMPs are proposed include the following:
  - 1. Areas proposed for infiltration BMPs shall be protected from sedimentation and compaction during the construction phase, as to maintain their maximum infiltration capacity.
  - 2. Infiltration BMPs shall be protected from receiving sediment laden runoff.
  - 3. The type of protection for infiltration BMPs shall be identified (i.e. orange construction fence surrounding the perimeter of the BMP).
- L. Maintenance during development of a project shall be the responsibility of the developer and/or landowner and shall include, but not be limited to:
  - 1. Removal of silt and debris from basins, traps, inlet protection, silt fencing, or other structures or measures when capacity of those structures is reached.
  - 2. Periodic maintenance of temporary control facilities such as replacement of straw bale dikes, straw filters, or similar measures.

3. Establishment or reestablishment of vegetation by seeding and mulching or sodding of scoured areas or areas where vegetation is not successfully been established.
4. Installation of necessary controls to correct unforeseen problems caused by storm events within design frequencies.
5. The contractor or developer shall be responsible for removal of all temporary measures and installation of permanent measures upon completion and stabilization of the project.

M. Total Maximum Daily Load (TMDL) Requirements

1. Agricultural activities within the Township containing an established non-point source TMDL, shall be conducted in compliance with 25 Pa. Code Chapter 102 (Erosion and Sediment Control), Chapter 91 (General Provisions) § 91.36 (Pollution control and prevention at agricultural operations) and Act 38 (Nutrient Management).
2. This section shall also apply to agricultural activities conducted in watersheds where TMDL's are established in the future.

**Section 312. Floodplain Delineation**

Floodplain areas shall be established and preserved as provided below:

- A. The one hundred (100) year floodplain shall be established for all watercourses and shall be delineated by one of the following methods.
  1. Reference to a FEMA issued Flood Insurance Rate Map (FIRM).
  2. Reference to the Township's Official Zoning Map.
  3. Reference to a floodplain delineation report prepared by an agency of the County, State, or U.S. Government.
  4. Reference to a floodplain delineation report prepared by an individual registered in the Commonwealth of Pennsylvania to perform such duties.
- B. Whenever a floodplain is located within or along a lot, the SWM Site Plan shall include: the boundary of the 100-year floodplain, along with the 100-year flood elevations and dimensions from the centerline of the watercourse; and a plan note indicating that construction or development within the floodplain shall be in strict accordance with the Township's Zoning Ordinance. Floodplains not delineated on a FEMA issued FIRM or the Township's Official Zoning Map shall be described with metes and bounds.
- C. The inclusion of 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 sewage disposal systems and replacement drain field areas unless otherwise specified in the Township Zoning Ordinance.

## **ARTICLE IV. STORMWATER MANAGEMENT SITE PLANS**

### **Section 401. General Requirements**

- A. Approval of a SWM Site Plan is required for any of the activities regulated by this Ordinance. Following approval by the Township, the SWM Site Plan and Stormwater Management BMP Operations and Maintenance Agreement shall be recorded in accordance with Section 703 prior to the issuance of any zoning or building permits or commencement of any land disturbance activity.
- B. Preliminary or final approval of subdivision and/or land development plans shall be contingent upon approval of the SWM Site Plan unless a SWM Site Plan is specifically exempted.
- C. All SWM Site Plans shall be designed and certified by individuals registered in the Commonwealth of Pennsylvania and qualified to perform such duties based on education and training.
- D. Plans which require access to, propose construction of and/or connection to stormwater management facilities or in any other way require the approval for activities within any street or highway under the jurisdiction of the PA Department of Transportation, shall include two (2) copies of the plans prepared to support the application for a Highway Occupancy Permit.
- E. Following approval, the SWM Site Plan shall be submitted in Portable Document Format (PDF) and a GIS-compatible format that is acceptable to the Township.

### **Section 402. Plan Exemptions**

Any regulated activity that meets the exemption criteria listed herein is exempt from the SWM Site Plan design, submission, and processing requirements of this Ordinance. These criteria shall apply to the total parent tract property and development, even if development takes place in phases. Parent tracts shall be properties as existing on January 22, 2013, unless specified otherwise, and shall provide the basis for individual or cumulative impervious area computations. Exemptions shall not relieve the applicant from applicable state and federal regulations, such as but not limited to those provided in Title 25 (Environmental Protection) or Title 67 (Transportation) of the Pennsylvania Code, or from implementing measures that are necessary to protect health, safety, and property.

- A. Exemptions include the following:
  - 1. Lot additions, land exchanges, subdivision of existing buildings, and other minor subdivision activity which does not involve any new building lots.
  - 2. Agricultural activities such as growing crops, plowing fields, gardening, etc. are exempt from this Ordinance provided the activities are performed according to the requirements of 25 Pa. Code Chapter 102. Construction of new buildings or impervious areas is not considered an agricultural activity.
  - 3. Forest management and timber operations are exempt from the SWM Site Plan preparation requirements of this Ordinance provided the activities are performed according to the requirements of 25 Pa. Code Chapter 102.

4. Where no subdivision of new lots or land development for new principal uses is involved, all other regulated activities may be exempted from the SWM Site Plan submission and processing requirements of this Ordinance provided the cumulative earth disturbance is less than one (1) acre, the applicant documents to the satisfaction of the Township Engineer that the lot improvements will not result in detrimental stormwater discharges to adjoining lands, roads, waterways or other areas, and the following criteria are satisfied:

Total Parcel Size <sup>a</sup>	Minimum Distance <sup>b</sup>	Impervious Area Exemption <sup>c</sup>
0 to ½ acre	10 feet	2,500 square feet
1 acre	20 feet	5,000 square feet
2 acres	40 feet	10,000 square feet
5 acres	50 feet	15,000 square feet
>5 acres	100 feet	20,000 square feet

Note: This chart applies to properties where a land development and/or SWM site plan was not previously approved. In the case where a land development and/or SWM site plan was previously approved, exemptions shall be at the discretion of South Lebanon Township upon recommendation by the Township Engineer.

- a. Parent tract or original parcel size, prior to any subdivision, as of January 22, 2013.
  - b. Minimum distance between proposed impervious areas and the nearest downslope property line(s). This distance shall be interpolated from the parcel sizes listed except the minimum distance shall be 10 feet for all parcels less than ½ acre (e.g. where parcel size equals 1.2 acres, the minimum distance to the nearest downslope property line shall be 24 feet).
  - c. Cumulative impervious area after January 22, 2013. The exempted impervious shall be interpolated from the parcel sizes listed except the maximum exempted impervious area shall not exceed 20,000 square feet (e.g. where parcel size equals 1.2 acres, the exempted impervious area shall equal 6,000 square feet).
5. Any lot receiving a SWM Site Plan exemption and subsequently found to be developed, or under no development, contrary to these exemption provisions or otherwise evidencing a stormwater runoff problem shall forthwith be subject to the following:
- a. Corrective actions shall be taken in the lot development to eliminate the noncompliance.
  - b. Submission of a revised subdivision, SWM Site Plan, or land development plan shall be required, depicting necessary stormwater management facilities, in accordance with standard plan processing procedures.
6. Exemptions from the SWM Site Plan design, submission and processing requirements of this Ordinance shall not relieve the applicant from any other provision of this Ordinance.
7. The Township may deny or revoke any exemption pursuant to this Section at any time for any project that the Township believes may pose a threat to public health and safety or the environment.

8. Any developer granted a SWM Site Plan exemption in accordance with the guidelines specified herein and is subsequently found to have developed the subject property contrary to the terms and conditions of the plan exemption shall be required to submit a SWM Site plan. Failure to satisfy these requirements is a violation of this Ordinance, punishable as provided by Article IX of this Ordinance.

#### **Section 403. SWM Site Plan Contents**

- A. SWM Site Plans shall be prepared by an engineer, land surveyor, or landscape architect licensed to practice in the Commonwealth of Pennsylvania. SWM Site Plans shall be accompanied by an application as provided in Appendix B-6.
- B. Drafting Standards.
  1. Plans shall be clearly and legibly drawn at a horizontal scale of 10 feet, 20 feet, 30 feet, 40 feet, or 50 feet to the inch. Plans illustrating overall tract boundaries for larger properties may be drawn at a horizontal scale of 100 feet to the inch.
  2. All profiles of stormwater management facilities and streets shall be drawn at a horizontal scale of 10, 20, 30, 40, or 50 feet to the inch and at a vertical scale of 1, 2, 3, 4, 5, or 10 feet to the inch.
  3. A north arrow, graphic scale and written scale shall be provided on each plan sheet.
  4. Dimensions shall be in feet and decimals; bearings shall be in degrees, minutes, and seconds. Lot line descriptions shall read in a clockwise direction.
  5. The sheet size shall be twenty-four by thirty-six (24 x 36) inches. If the plan is prepared in two (2) or more sections, a key map showing the location of the sections shall be placed on each sheet. If more than one (1) sheet is necessary, each sheet shall be the same size and numbered to show the relationship to the total number of sheets in the plan (e.g. Sheet 1 of 5).
  6. A mapping legend for all existing and proposed features shall be provided.
- C. General Requirements.

The following information shall be included on all SWM Site Plans:

1. The proposed project name or identifying title.
2. Name of the municipality or municipalities in which the project is located, including the location of any municipal boundaries if located within 200 feet of the subject tract.
3. The name, address and telephone number of the owner(s), equitable owner(s) and/or developer(s) of the parent tract.
4. The name, address and telephone number of the individual(s) or firm that prepared the plan.
5. The file or project number assigned by the firm that prepared the plan.

6. The plan date and the date(s) of all plan revisions.
7. The date the property was surveyed, the method of survey, vertical and horizontal datum used, and location and elevation of the benchmark.
8. A table indicating the existing zoning district and the required lot size, required setbacks, required maximum and/or minimum development density, maximum building height and maximum lot coverage.
9. A statement on the plan indicating the granting of a prior zoning amendment, special exception, conditional use, or variance, if applicable, along with any prior modifications granted by the Board of Supervisors to sections of this Ordinance. Any conditions associated with the modifications, variances, special exceptions, or conditional uses shall also be listed on the plan.
10. The expected project time schedule, including start and completion dates.
11. The names of all adjacent landowners; both adjoining and across existing rights-of-way along with the plan book record numbers of all previously recorded plans for adjacent properties. Lot numbers shall be provided for lots previously subdivided from the same parent tract as the proposed subdivision. These existing lot numbers shall be enclosed within a triangle to distinguish them from proposed lots.
12. A location map, drawn to a scale of 1,000 or 2,000 feet to the inch. The location map shall show the project site's tract boundaries, limits of development as well as nearby streets and bodies of water.
13. Parent tract's source of title including, deed book and page number, plan book and number and uniform parcel identifier (UPI number).
14. An index of drawings included in the SWM Site Plan set (e.g. Cover Sheet, Existing Conditions Plan, Post-Construction Stormwater Management Plan, Post-Construction Stormwater Management Details, Erosion and Sediment Pollution Control Plan, etc.).
15. An Ownership and Maintenance (O&M) Plan for all existing and proposed stormwater management facilities, including required maintenance activities and schedule for each type of facility.
16. Provisions for permanent access or maintenance easements for all stormwater management facilities, as necessary to implement the O&M Plan.
17. Statement of deed restrictions or covenants, which may be a condition of sale of the property.
18. The "Standard Stormwater Management Notes" as listed in Appendix E.
19. A detailed schedule of required municipal inspections, which is customized for the project.
20. An overlay showing soil names and boundaries as shown in the USDA NRCS Soil

Survey of Lebanon County. Provide a table listing the following information for the applicable on-site soil types.

- a. Soil name
  - b. Soil map abbreviation
  - c. Hydrologic group
21. Delineated pre- and post-development drainage areas and subwatershed areas for each point of interest (POI). POIs shall be located and identified on the drainage area maps. Flow paths used to calculate the times of concentration to each POI shall be shown. The flow type, length and slope of each segment along time of concentration flow paths shall be identified and labeled (i.e. 100' of sheet flow at 2%).

D. Existing Features.

The following features shall be shown on all SWM Site Plans, unless otherwise specified by this Ordinance, and shall be shown on *a separate sheet* titled "Existing Conditions Plan". No proposed features shall be included on this sheet.

- 1. The parent tract boundary with bearing and distances. Existing boundary lines shall be field verified *when located within 200 feet of the proposed limits of disturbance*.
- 2. The total area of the parent tract in square feet and acres.
- 3. The location and type of existing boundary markers and monuments along the perimeter of the parent tract. Existing boundary markers and monuments shall be field verified *when located within 200 feet of the proposed limits of disturbance*.
- 4. Existing elevation contours shall be shown at the following minimum vertical intervals:

Average Natural Slope	Required Contour Interval
0 to 3%	1-foot contour interval
4 to 20%	2-foot contour interval
21% and greater	5-foot contour interval

- a. Contours shall be shown a minimum of 100 feet beyond the project site.
  - b. Contour interval may be adjusted based upon horizontal scale with concurrence of the Township Engineer.
  - c. Contours plotted by interpolation of the United States Geodetic Survey 7.5' mapping will not be accepted.
  - d. Spot elevations shall be provided at high and low points in critical areas where elevations cannot be interpolated between contours.
5. The following items *when located upon or within 100 feet* of the project site:

- a. The location, name, and dimensions of existing rights-of-way and cartways for private or public streets, alleys, and driveways.
- b. The location of traffic signs and control signals.
- c. The location, size and use of existing buildings and other man-made features.
- d. The location and size of existing sanitary sewer mains, water supply mains, on-lot sewage systems, wells, fire hydrants and stormwater collection, conveyance, and management facilities.
- e. Existing easements and rights-of-way. Complete description of all existing rights-of-way and easements, including distances and bearings with curve segments comprised of radius, tangent, arc, and chord.
- f. Significant environmental or topographic features, including, but not limited to:
  - 1) Archaeological sites
  - 2) Cemetery or burial sites
  - 3) Drainage features
  - 4) Floodplains, including floodways, special flood hazard areas (SFHA) and base flood elevations (if available).
  - 5) Historic structures/sites
  - 6) Quarry sites
  - 7) Rock outcroppings
  - 8) Sinkholes
  - 9) Soils, including highly erosive and prime agricultural.
  - 10) Solid waste disposal areas
  - 11) Steep slopes
  - 12) Underlying geology with any hazardous geology and potential impacts to groundwater noted.
  - 13) Waterways, lakes, and ponds
  - 14) Wetlands
  - 15) Wooded areas
- g. Zoning district boundaries.

E. Proposed Features and Plan Information.

The following proposed features and plan information shall be provided for all SWM Site plans and shall be shown on a separate sheet(s). The proposed features and plan information shall be overlaid upon a copy of the existing features plan. The existing features shall be "screened" or "shaded" on the proposed features plan.

1. Lot numbers (where applicable).
2. Proposed land use(s). If multiple land uses are proposed, the location of each land use shall be indicated.
3. The layout of lots with accurate bearings and distances and lot areas for all parcels.
4. Location and material of all permanent monuments and lot line markers, including a note that all monuments and lot markers are set or indicating when they will be set.
5. Building setback line and building envelope.
6. Identification of existing buildings or other man-made features to be demolished.
7. Easements and rights-of-way. The purpose and width of the easement and right-of-way shall be identified on the plan.
8. Complete description of all proposed rights-of-way and easements, including distances and bearings with curve segments comprised of radius, tangent, arc, and chord.
9. A minimum 20-foot-wide easement shall be provided around all stormwater management facilities to reserve the easement area for drainage purposes only and to provide ingress and egress from a public right-of-way. Identify stormwater easements and facilities to be dedicated to the Township. Provide a note prohibiting the placement of trees, shrubbery, and structures within drainage easements unless approved by the Township.
10. The location and configuration of proposed buildings, parking lots, common open space, recreational areas, and all other significant planned facilities.
11. A note listing the type and amount of proposed impervious area.
12. The location and configuration of proposed streets, alleys, driveways, and sidewalks including right-of-way and cartway widths.
13. Street centerline for each proposed public or private street shown on the SWM Site Plan including corresponding centerline stationing.
14. Proposed street names.
15. A detailed grading plan. Proposed elevation contours shall be shown at the same minimum vertical intervals as the existing contours as specified in Section 403.D.4. The grading plan shall include finished grades and finished floor elevations. This information may be provided on separate sheets. Spot elevations shall be provided at high and low

points in critical areas between contours.

16. Plans and profiles for proposed public or private streets and alleys, sanitary sewer, water distribution systems and gas mains. All street profiles shall show at least the existing (natural) profile along the centerline, proposed grade at the centerline.
17. Plans and profiles of the proposed stormwater management facilities, including, but not limited to, drainage pipes, culverts, inlets, catch basins, manholes, clean-outs, underground storage facilities, rain gardens, basins and channels. The length, size, slope, material, and invert elevations shall be specified for all drainage pipes and culverts. Top of grate, rim, invert and bottom (i.e. sump) elevations shall be specified for all drainage structures.
18. Labeled dimensions and capacities for all stormwater detention and retention BMPs.
19. Construction details, sections, and specifications of stormwater management facilities with sufficient information and dimensions for construction interpretation.
20. Where the project site is located partially or wholly within an area prone to frequent flooding (either by impoundment or conveyance) as indicated by the flood fringe boundary and floodway map, profiles, and supporting data, soil type or local historical record; the developer shall supply the location and elevation of all proposed roads, fills, utilities, buildings, stormwater management, and erosion control facilities.
21. Location of proposed on-lot sewage systems and well locations. Proposed stormwater infiltration BMPs shall be located a minimum of fifty (50) feet from on-lot sewage infiltration areas.
22. Location of all percolation and deep probe test holes used in the design of stormwater management facilities. Infiltration rates used in the design of stormwater infiltration BMPs shall be based upon tests conducted at the site of the proposed BMPs.
23. Limits of project phases or sections and a narrative of the construction sequence.
24. The location of all erosion and sediment pollution control facilities.

F. Certificates.

The following certifications shall be included on SWM Site Plans:

1. Certificate of Ownership, as provided in Appendix A.
2. Certificate, signature, and seal of a professional registered in the Commonwealth of Pennsylvania and qualified to perform such duties, as provided in Appendix A.
3. Certificate of review by the Township Engineer, as provided in Appendix A.
4. Certificate of approval by the Board of Supervisors, as provided in Appendix A.

G. Additional Requirements.

The following notes shall be provided on all SWM Site Plans, as applicable:

1. Contractors and property owners shall not store construction materials or locate trash receptacles (i.e. dumpsters) on the paved cartway of streets.
2. All mud from construction activities that is tracked onto streets shall be cleaned by the responsible contractor or property owner at the end of each workday.
3. Stormwater inlets or drainage pipes which become filled with mud or debris from construction activities shall be cleaned by the responsible contractor or property owner.

#### **Section 404. Post-Construction Stormwater Management (PCSM) Report**

- A. Design data and calculations must be submitted in a comprehensive PCSM report. The report shall be eight and one-half by eleven (8.5 x 11) inches in size, shall be spirally bound or in a three-ring binder, and shall include front and rear protective covers. The format of the report shall include, but not be limited to, the sections listed below. Each section of the report shall contain a tabbed divider, labeled to match the table of contents. All pages, including appendices, shall be numbered.
- B. Required Sections and Contents.
  1. Title page that includes the project name and location, name and address of design firm, date of original submittal, revision dates, and seal and signature of the registered professional responsible for preparing the report.
  2. Table of contents listing all sections and corresponding page numbers.
  3. Narrative containing the following information:
    - a. A general description of the project.
    - b. A description of the pre- and post-development drainage area characteristics.
    - c. A description of the project's impact on downstream properties, drainage facilities and waterways that may receive runoff from the project site.
    - d. A description of the project's impact on any sensitive natural features (i.e. wetlands, floodplains, sinkholes, etc.).
    - e. A description of the overall stormwater management concept for the project.
    - f. A list of the soil types found within the project area, including the hydrologic group associated with each soil type, drainage characteristics, construction development restrictions and resolutions to such restrictions.
    - g. A description of the geological formations underlying the project site, including the presence and/or probability of sinkholes.
    - h. In areas of carbonate rock and Karst topography, recommendations to mitigate the effects of stormwater runoff and infiltration on sinkholes.

- i. A description of the methodology used for the design calculations.
- j. A description of the stormwater BMPs to be utilized.
4. Summary of flows comparing pre- and post-development discharge to each point of discharge from the development.
5. Site location map taken from 7.5-minute United States Geological Survey or equivalent.
6. Soils location map showing soil names and boundaries as shown in the USDA NRCS Soil Survey of Lebanon County.
7. Pre-development runoff calculations.
8. Pre-development storage facility geometry, including stage storage table/curve, outlet structure configuration, and primary/secondary spillway configuration (where applicable).
9. Pre-development storage facility routings (where applicable)
10. Post-development runoff calculations.
11. Post-development storage facility geometry, including stage storage table/curve, outlet structure configuration, and primary/secondary spillway configuration.
12. Post-development storage facility routings.
13. Anti-seep collar design.
14. Emergency spillway freeboard and stability calculations.
15. Volume management calculations using DEP's PCSM spreadsheet or equivalent.
16. Water quality calculations using DEP's PCSM spreadsheet or equivalent.
17. Infiltration testing results.
18. Open channel/Swale/Inlet/Culvert runoff calculations including rational coefficients and time of concentration.
19. Storm sewer and culvert design calculations.
20. Inlet capacity calculations.
21. Gutter flow calculations.
22. Open channel/swale design calculations.

23. Outlet protection calculations.
  24. Floodplain information and calculations. Include appropriate floodplain mapping and/or detailed HEC-RAS calculations where applicable. A separate floodplain delineation report may be required at the discretion of the Township Engineer.
  25. Wetland information. A separate wetland delineation report may be required at the discretion of the Township Engineer.
  26. Miscellaneous design details and computations.
  27. Appendices.
- C. If any of the preceding sections are not applicable to the project, the report should still list the section in the table of contents with the annotation “not applicable.” However, a separate tab need not be provided for that section.

#### **Section 405. SWM Site Plan Processing Requirements**

- A. Submissions shall include at a minimum:
1. Two (2) copies of all plans, reports and calculations for all submissions, re-submissions, revisions, or modifications.
  2. Two (2) copies of all state, federal or municipal permits required as an approval prerequisite.
  3. Digital Portable Document Format (PDF) copies of all items included in Sections 405.A.1 and 405.A.2 above.
- B. Review of SWM site plans shall be the responsibility of the Township Engineer.
1. The Township Engineer shall review the SWM Site Plan for consistency with this Ordinance. The Township Engineer shall require receipt of a complete plan, as specified in this Ordinance.
  2. The Township Engineer shall review the SWM Site Plan, subdivision, or land development for any submission against the SALDO for all provisions not superseded by this Ordinance.
  4. If the SWM Site Plan is consistent with this Ordinance, the Township Engineer will forward a letter recommending approval to the Township.
  5. If the SWM Site Plan is inconsistent with this Ordinance, the Township Engineer will forward a review letter citing the inconsistencies to the Township and the developer’s design professional. SWM Site Plans found to be inconsistent with this Ordinance may be revised by the Developer and resubmitted.
  6. For Regulated Activities requiring a Chapter 105 Joint Permit Application, the Township Engineer (upon request of the applicant or applicant’s agent) shall notify DEP whether the SWM Site Plan is consistent with this Ordinance and forward a copy of the review letter to the Township.

7. For Regulated Activities requiring a National Pollutant Discharge Elimination System Permit Application, the Township Engineer (upon request of the applicant or applicant's agent) shall notify DEP whether the SWM Site Plan is consistent with this Ordinance and forward a copy of the review letter to the Township.
  8. South Lebanon Township shall not approve any subdivision, land development, or SWM Site Plan for Regulated Activities as defined in Section 201 of this Ordinance if the SWM Site Plan is inconsistent with this Ordinance, as determined by the Township Engineer. All required permits from DEP must be obtained prior to issuance of a zoning or building permit.
  9. The Township or its designee shall not issue a zoning or building permit for any Regulated Activity as defined in Section 201 of this Ordinance prior to SWM Site Plan approval.
  10. The Developer shall maintain a copy of the approved SWM Site Plan at the project site during construction, as record drawings. Any discrepancies with the original design that warrants changes to the SWM Site Plan shall be submitted to the Township Engineer for review and approval.
  11. The Township shall notify the applicant in writing within 90 days of submission whether the SWM Site Plan is approved, disapproved, or inconsistent with this Ordinance. If the SWM Site Plan is part of a Subdivision and Land Development Plan, such notification shall occur within the time period specified in Section 508 Pennsylvania Municipalities Planning Code. If a longer notification period is provided by other statute, regulation, or ordinance, the applicant will be so notified by the Township.
  12. If the Township disapproves the SWM Site Plan, the Township will state the reasons for the disapproval in writing.
  13. Changes to the approved SWM Site Plan shall be authorized only with the written approval of the Township Engineer.
  14. Prior to formal plan approval, plans containing stormwater management design shall require the review signature of the Township Engineer.
- C. Incomplete submissions 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 shall not, however, constitute a waiver of any deficiencies or irregularities.
- D. Final Plan Certification.
1. After the Board's approval of the SWM Site Plan and the required changes, if any, are made, the applicant shall proceed to prepare six (6) paper copies of the plan sets at twenty-four by thirty-six (24 x 36) inches.
  2. Upon compliance with all conditions of plan approval, the copies of the SWM Site Plan shall be presented to the Township for signatures by the Township Engineer and the Board of Supervisors. Plans will not be signed by the Board of Supervisors if submitted more

than ninety (90) days from the Board's final approval action unless the Board grants a modification by extending the effective time period of the approval.

#### **Section 406. As-Built, Certificate of Completion, and Final Inspection**

- A. The developer shall be responsible for providing as-built plans of all SWM BMPs included in the approved subdivision, land development or SWM Site Plan. The as-built plans and an explanation of any discrepancies with the construction plans shall be submitted to South Lebanon Township.
- B. The as-built submission shall include a certificate of completion letter signed by a licensed professional verifying that all permanent SWM BMPs have been constructed according to the approved plans and specifications.
- C. After receipt of the certificate of completion from the applicant's qualified professional, the Township Engineer may conduct a final inspection.
- D. Minor subdivisions and SWM Site Plans with less than one (1) acres of land disturbance shall be exempt from requirement for submission of an as-built plan unless, in the opinion of the Township Engineer, as-built conditions vary from the approved plan such that an as-built plan is warranted.
- E. An as-built plan shall contain the following stormwater related information:
  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 SWM BMPs, including type and size of storm drainage pipes.
  4. For all storage SWM BMPs (e.g. stormwater basins, rain gardens and infiltration facilities), the following information shall be provided:
    - a. As-built elevation contours of the SWM BMP as applicable, or the horizontal and vertical dimensions of underground facilities to include depth from ground surface to top of facility.
    - b. Verification of materials used in construction (e.g. geotextile materials).
    - c. As-built outlet structure details, including type, size, and inverts of discharge pipes.
    - d. As-built elevations for embankments and emergency spillways.
    - e. A table showing the stage/storage/discharge information for the constructed conditions.
    - f. A table providing a comparison of the approved design versus the as-built discharge rates.

- F. The Township Engineer, the Lebanon County Conservation District representatives, and duly authorized representatives of South Lebanon Township may enter at reasonable times upon any property within the Township to inspect stormwater facilities, structures, and related site improvements for compliance with the approved plans and this Ordinance.
- G. Construction of stormwater management, erosion control and related facilities shall be in accordance with the approved subdivision and land development plans and the requirements of this Ordinance. Construction or development contrary to, or not in compliance with, the stormwater management design on the approved subdivision or land development plan shall be a violation of this Ordinance, punishable as provided by Article IX of this Ordinance.
- H. Following construction and release of financial security, the Township Engineer may inspect the site periodically to confirm operation and maintenance of the stormwater facilities are being performed in accordance with the approved plan and this Ordinance.
- I. The cost of inspections shall be paid by the person/entity responsible for operation and maintenance of the stormwater facilities, in accordance with a fee schedule adopted as part of this Ordinance or by a fee resolution adopted thereafter.

**Section 407. Modification of Stormwater Management Facilities**

A modification which involves a change in stormwater management methods, facilities or techniques, or that involves the relocation or re-design of stormwater management facilities, or which is necessary because soil or other conditions are not as stated on the approved plan, shall require a SWM Site Plan resubmission in accordance with the plan requirements set forth in this Ordinance and the South Lebanon Township Subdivision and Land Development Ordinance.

**Section 408. Modification of Stormwater Management Ordinance Provisions**

- A. The provisions of this Ordinance are intended as minimum standards for the protection of the public health, safety and welfare of the residents and inhabitants of South Lebanon Township. South Lebanon Township may grant a modification of the requirements of one or more provisions of this Ordinance if the Township concludes that the literal enforcement will exact undue hardship because of peculiar conditions pertaining to the land in question, provided that such modifications will not be contrary to the public interest and that the purpose and intent of this Ordinance is observed. Cost or financial burden shall not be considered a hardship. Modifications will be considered if an alternative standard or approach will provide equal or better achievement of the purpose of this Ordinance.
- B. All requests for a modification shall be in writing to South Lebanon Township and shall accompany and be part of the application for a SWM Site Plan. The request shall state in full the grounds and facts of unreasonableness or hardship on which the request is based, the provision or provisions of the Ordinance involved and the minimum modification necessary.
- C. In granting waivers/modifications, South Lebanon Township may impose such conditions as will, in its judgment, secure substantially the objectives of the standards and requirements of this Ordinance.

## Section 409 Ownership and Maintenance Responsibilities

For the purpose of this section, drainage courses, channels, swales, stormwater inlets, pipes, conduits, detention and retention basins, subsurface storage structures, and other stormwater management facilities shall be included under the term "SWM BMPs."

- A. The SWM Site Plan shall reflect and/or be accompanied by supporting documentation identifying the ownership and method of administering and maintaining all permanent SWM BMPs.
- B. The SWM Site Plan for the development site shall contain an operation and maintenance plan for review by the Township Engineer. The operation and maintenance plan shall outline routine maintenance actions and schedules necessary to insure proper operation of the SWM BMPs.
- C. The SWM Site Plan for the development site shall establish responsibilities for the continuing operating and maintenance of all proposed SWM BMPs, consistent with the following principals:
  1. If a development consists of structures such as streets, sewers and other public improvements which are to be dedicated to the Township, SWM BMPs may also be dedicated to and maintained by the Township. However, if the Township accepts dedication of streets, the Township is under no obligation to accept dedication of SWM BMPs located outside of the public right-of-way.
  2. If a development site is to be maintained in a single ownership or if sewers and other public improvements are to be privately owned and maintained, then the ownership and maintenance of SWM BMPs shall be the responsibility of the owner, lessee, or private management entity (e.g. homeowners association or other parties of interest). Facilities owned and maintained by a private entity shall be maintained in accordance with the terms of an agreement, declaration of easement or other legally binding documentation approved in form by South Lebanon Township. The agreement, declaration of easement or other legally binding documentation shall provide that South Lebanon Township and the Township Engineer have the right to:
    - a. Inspect the facilities at any time.
    - b. Require the private entity to take corrective measures and assign the private entity reasonable time periods for any necessary action.
    - c. Authorize maintenance to be done and lien all cost of the work against the properties of the private entity responsible for maintenance.
- D. South Lebanon Township, upon recommendation of the Township Engineer, shall make the final determination on the continuing maintenance responsibilities. The Governing Body reserves the right to accept the ownership and operating responsibility for any or all of the stormwater management controls.
- E. Maintenance of SWM BMPs shall include, but not be limited to, the following:

1. Liming and fertilizing vegetated channels and other areas in accordance with soil test recommendations.
2. Reestablishment of vegetation by seeding and mulching or sodding of scoured areas or areas where vegetation has not been successfully established.
3. 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.
4. Removal of silt from all permanent structures which trap silt and sediment in order to keep the material from building up in grassed waterways, pipes, detention basins, infiltration facilities, or other SWM BMPs, and thus reducing their capacity to convey or store water.
5. Regular inspection of the areas in question to assure proper implementation of SWM BMPs, maintenance, and care.
6. All pipes, swales and detention facilities shall be kept free of any debris or other obstructions and maintained in original design condition.
7. Replacement or repair of damaged structural SWM BMPs or components of such SWM BMPs.

#### **Section 410. Operation & Maintenance Agreement**

- A. The Township shall make the final determination on the continuing ownership and maintenance (O&M) responsibilities of stormwater management facilities and BMPs. The Township may require a dedication of such facilities as part of their requirements. Such a requirement is not an indication that the Township will accept the facilities. The Township reserves the right to accept or reject the ownership and operating responsibility for any portion of the stormwater management controls.
- B. Prior to final approval of the SWM Site Plan, subdivision plan, or land development plan, the property owner shall sign and record the O&M Agreement contained in Appendix D, which is attached and made part hereof, covering all stormwater control facilities that are to be privately owned.
- C. The owner, successor and assigns shall operate and maintain all facilities in accordance with the approved schedule(s) in the O&M Plan.
- D. The owner shall convey to the Township easements to assure access for periodic inspections and maintenance, as necessary, by the Township representatives.
- E. The owner shall keep on file with the Township the name, address, and telephone number of the person or company responsible for operation and maintenance activities. In the event of a change, new information shall be submitted by the owner to the Township within ten (10) working days of the change.
- F. Other items may be included in the agreement where determined necessary to guarantee the satisfactory maintenance of all facilities. The O&M agreement shall be subject to the review and approval of the Township.

- G. The owner is responsible for operation and maintenance of the SWM BMPs. If the owner fails to adhere to the O&M Agreement, the Township may perform the services required and charge the owner appropriate fees. Nonpayment of fees may result in a lien against the property.
- H. Facilities, areas, or structures used as SWM BMPs shall be enumerated as permanent real estate appurtenances and recorded as deed restrictions or conservation easements that run with the land.
- I. The O&M Plan shall be recorded as a restrictive deed covenant that runs with the land.
- J. The Township may take enforcement actions against an owner for any failure to satisfy the provisions of this Ordinance.

**Section 411. Maintenance of Existing Stormwater Management Facilities**

- A. Stormwater management facilities and BMPs 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 a homeowners' association shall be maintained by the individual property owners. Such maintenance shall include at a minimum those items set forth in Section 409.E. If the Township determines at any time that any permanent stormwater management facility has been eliminated, altered, blocked through the erection of structures or the deposit of material, or improperly maintained, the 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 10% of the cost of the work. If the property owner does not pay such bill within 30 days, the Township may file a municipal claim against the property upon which the work was performed in accordance with the applicable laws.
- B. No person shall modify, remove, fill, landscape or alter stormwater management facilities which have been installed on a property unless a SWM Site Plan has been approved to permit such modification, removal, filling, landscaping or alteration. No person shall place any structure, fill, landscaping or vegetation into a stormwater management facility or within a drainage easement, which will limit or alter the functioning of the facility or easement in any manner.
- C. The Township may take enforcement actions against an owner for any failure to satisfy the provisions of this Ordinance.

**Section 412. Authorization to Construct and Term of Validity**

- A. The Township's approval of a SWM Site Plan authorizes the regulated activities contained in the SWM Site Plan for a maximum term of validity of five (5) years following the date of approval. The Township may specify a term of validity shorter than five (5) years in the approval for any specific SWM Site Plan. Terms of validity shall commence on the date the Township signs the approval for a SWM Site Plan. If an approved SWM Site Plan is not completed according to Section 406 within the term of validity, then the Township may

consider the SWM Site Plan disapproved and may revoke any and all permits. SWM Site Plans that are considered disapproved by the Township shall be resubmitted in accordance with the provisions of Section 405 of this Ordinance.

- B. If the SWM Site Plan is part of a Subdivision and Land Development Plan application, such approval shall be valid for a term as specified in Section 508 of the Pennsylvania Municipalities Planning Code.

## ARTICLE V. INSPECTIONS

### Section 501. General Requirements

- A. Inspections regarding compliance with the approved SWM Site Plan are a responsibility of the Township. The Township Engineer shall inspect all phases of construction of the stormwater management improvements as shown on the approved SWM Site Plan.
- B. A copy of the approved SWM Site Plan shall be on file at the project site throughout the duration of construction.
- C. During any stage of the work, if the Township Engineer determines that the SWM BMPs are not being installed in accordance with the approved SWM Site Plan, South Lebanon Township shall provide written notification to the land owner and/or developer stipulating the deficiencies and require that the deficiencies be corrected within 30 days (or longer as may be required). If the deficiencies are not corrected within the specified period of time, South Lebanon Township may:
  - 1. Revoke any existing permits until such deficiencies are corrected to the satisfaction of the Township Engineer.
  - 2. Utilize financial security posted by the owner and/or developer as part of the Developer's Improvement Guarantee Agreement to install any unfinished facilities or remedy any improperly constructed facilities.
  - 3. Pursue other legal remedies pursuant to Article IX of this Ordinance.
  - 4. After receipt of the certificate of completion letter and as-built plan by South Lebanon Township, a final inspection shall be conducted by the Township Engineer or designated representative to certify compliance with this Ordinance.

### Section 502. Post-Construction Schedule of Inspections

- A. SWM BMPs should be inspected by the landowner, or the owner's designee (including the Township for dedicated and owned facilities), according to the following list of minimum frequencies:
  - 1. Annually for the first five (5) years following construction.
  - 2. Once every three (3) years thereafter.
  - 3. During or immediately following a 10-year or greater storm. The 10-year storm is 4.6 inches of rainfall in a 24-hour period.
- B. A written inspection report shall be created to document each inspection. The inspection report shall contain the date and time of the inspection, the individual(s) who completed the inspection, the location of the BMP, facility or structure inspected, observations on performance, and recommendations for improving performance, if applicable. Upon request by the Township, inspection reports shall be submitted to the Township within 30 days following completion of the inspection.

## ARTICLE VI. PERFORMANCE GUARANTEE

### Section 601. Developer's Improvement Guarantee Agreement

- A. As a condition prerequisite for SWM Site Plan approval, the developer shall execute a Developer's Improvement Guarantee Agreement prepared by the Township's Solicitor and the developer shall deliver to the Township financial security, in a form and manner deemed acceptable to the Board of Supervisors, to guarantee the construction and installation of the required improvements.
- B. The Developer's Improvement Guarantee Agreement shall, inter alia, include provisions whereby the developer agrees:
  1. To construct or cause to be constructed, at developer's own expense, all stormwater management facilities shown on the approved SWM Site Plan and in accordance with the requirements of this Ordinance.
  2. To maintain, at developer's own cost, the said stormwater management facilities shown on the SWM Site Plan until the same are accepted by resolution of the Board of Supervisors.
  3. To pay all of the Township's reasonable administrative, inspection, engineering and legal fees related to the review and processing of the SWM Site Plan and the creation, recording, and enforcement of the Developer's Improvement Guarantee Agreement.
  4. To obtain any easements or releases which may be necessary for the construction of any improvement which traverses lands of persons other than the developer. Any such easement or release shall inure to the benefit of the Township, as well as to the developer.
  5. To exonerate, indemnify and hold harmless the Township, its officers, engineers and solicitors, its appointees and employees, and its other agents, independent contractors, and assigns, from liability arising from the developer's construction or development of the project.
  6. To prevent soil erosion, sedimentation, and water damage to the subject and adjacent properties.
  7. To make provisions and be responsible, at developer's own cost and expense, for removing all mud, litter and/or debris on roads in the Township resulting from any vehicles and equipment leaving the development site and entering onto streets within the Township.
  8. To be responsible for and repair, at the developer's own cost and expense, any damage done to any existing streets within the Township and the Township's and/or Authority's water and sewer systems as a result of, or in connection with, the performance of any work related to the SWM Site Plan.
  9. To maintain general liability, property damage and any other required insurance in forms

and amounts deemed acceptable to the Township, naming the Township, its agents, building/zoning inspectors, officials, employees, and authorized representatives, as an additional insured.

10. To dedicate to the Township by deed, in a form and manner deemed acceptable to the Township Solicitor, any storm sewer mains and lines, storm sewer drainage facilities, stormwater management areas and facilities, and open space areas or other lands, intended for dedication to, and acceptance by, the Township, and to provide to the Township as-built plans certified by the developer's engineer for any constructed storm sewer mains and lines, storm sewer drainage facilities, stormwater management areas and facilities, and open space areas or other lands to be conveyed or transferred to the Township.

## **Section 602. Performance Guarantee**

- A. A performance guarantee for the required stormwater management improvements shall be supplied by the Developer in conjunction with the SWM Site Plan approval unless otherwise required for subdivision and land development plan approval. The applicant shall provide the performance guarantee to the Township to ensure the timely installation and proper construction of all stormwater management facilities and/or stormwater BMPs as required by the approved SWM Site Plan and this Ordinance.

- B. Type of Guarantee.

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 escrow accounts shall be deemed acceptable financial security for the purposes of this Section. Such financial security shall be posted with a Federal or Commonwealth chartered lending institution chosen by the party posting the financial security, provided said lending institution is authorized to conduct such business within the Commonwealth. Such financial security shall provide for, and secure to the public, the completion of any improvements which may be required on or before the date fixed in the formal action of approval or accompanying agreement for completion of the improvements.

- C. Amount of Guarantee.

The amount of financial security to be posted for the completion of the required improvements shall be equal to one hundred and ten percent (110%) of the cost of completion estimated as of ninety (90) days following the date scheduled for completion by the developer.

1. 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 ninetieth (90<sup>th</sup>) day after either the original date scheduled for completion or a rescheduled date of completion.
2. Subsequent to said adjustment, the Township may require the developer to post additional security in order to assure that the financial security equals said one hundred

and ten percent (110%) of the estimated cost of the remaining improvements. Any additional security shall be posted by the developer in accordance with this Subsection.

3. 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 licensed professional as such in this Commonwealth and certified by such licensed professional to be a fair and reasonable estimate of such cost. The Township Engineer shall review and approve the cost estimate or, for good cause, refuse to accept the estimate.
4. If the party posting the financial security 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 to an amount not exceeding one hundred and ten percent (110%) 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 cost estimate preparation procedure. A developer who fails to complete the improvements within the allotted time specified in the financial guarantee shall, at least sixty (60) days in advance of the guarantee expiration date, renew or resubmit a financial guarantee. Failure to keep a financial guarantee in effect until the completion and approval of all improvements shall be a violation of this Ordinance.

D. Release from Guarantee.

As the work of installing the required improvements proceeds, the party posting the financial security may request the release, from time to time, of such portions of the financial security for work upon the improvements that has been completed. Any such requests shall be made in writing to the Township, and within forty-five (45) days of receipt of such request the Township Engineer shall certify, in writing, whether or not such portion of the work upon the improvements has been completed in accordance with the approved plan.

1. When the improvements are certified to be in accordance with the approved plan, the Township shall authorize release by the lending institution of an amount as estimated by the Township Engineer fairly representing the value of the improvements completed.
2. If the Township fails to act within said forty-five (45) day period, the release of funds shall be deemed to have been approved as requested.
3. The Township may, prior to final release at the time of completion and certification by its engineer, require retention of one hundred ten percent (110%) of the estimated cost of the remaining improvements.
4. The applicant shall assume the necessary expense incurred for the inspection of improvements. Such inspection costs shall be based upon a schedule, established by Resolution, and amended from time to time as deemed necessary.

E. Maintenance Guarantee.

Where the Township accepts dedication of all or some of the required improvements following completion, the Township may require the posting of financial security to secure

structural integrity of said improvements as well as the functioning of said improvements in accordance with the design and specifications depicted on the final plat for a term not to exceed eighteen (18) months from the date of acceptance of dedication. Said financial security shall be of the same type as otherwise required in this Section with regard to installation of such improvements. The amount of financial security shall not exceed fifteen (15) percent of the actual cost of installation of said improvements. The amounts of all improvements included in the Maintenance Guarantee may be reduced to said 15% and retained within the Performance Guarantee until notification from the Township of Maintenance Guarantee establishment is received by the Township.

F. Remedies to Effect Completion of Improvements.

In the event that any required improvements have not been installed as provided in this Ordinance or in accordance with the approved plan, the Township is hereby granted the power to enforce any financial security by appropriate legal and equitable remedies. If proceeds of such financial security are insufficient to pay the cost of installing or making repairs or corrections to all the improvements covered by said security, Township may, at its option, install part of such improvements in all or part of the subdivision or land development and may institute appropriate legal or equitable action to recover the moneys necessary to complete the remainder of the improvements. All the proceeds, whether resulting from the financial security or from any legal or equitable action brought against the developer, or both, shall be used solely for the installation of the improvements covered by such security, and not for any other Township purpose. Failure to properly install the required improvements shall also constitute a violation of this Ordinance, punishable as provided by Article IX of this Ordinance.

G. At the completion of the project, and as a prerequisite for the final release of the improvements guarantee, the owner/developer or his representatives shall:

1. Provide a certificate of final completion letter from an engineer, landscape architect, surveyor, or other qualified professional verifying that all permanent facilities have been constructed according to the plans and specifications and approved revisions thereto.
2. Provide a set of as-built (record) drawings, if applicable.

H. After receipt of the certificate of completion letter and as-built plan by South Lebanon Township, a final inspection shall be conducted by the Township Engineer or designated representative to certify compliance with this Ordinance.

**Section 603. Indemnification and Insurance**

The written Developer's Improvement Guarantee Agreement entered into by the developer with the Township shall include therein an Indemnification Agreement whereby the developer agrees to indemnify and hold the Township harmless from any and all liability, including, but not limited to, any and all aspects of construction, stormwater management, site grading, utility line trenching and construction, and street excavation. The Developer's Improvement Guarantee Agreement entered into by the developer with the Township shall also require the developer to provide to the Township insurance and insurance coverages in form and amounts deemed acceptable to the Board of Supervisors.

## **ARTICLE VII. ADMINISTRATION, FEES, AND EXPENSES**

### **Section 701. Schedule of Fees**

The Township shall establish a Fee Schedule by resolution of the South Lebanon Township Board of Supervisors based on the size of the Regulated Activity and based on the Township's costs for administering and reviewing SWM Site Plans. The Township shall periodically update the Fee Schedule to ensure that administrative, review and other plan-related costs are adequately reimbursed.

### **Section 702. Expenses Covered by Fees**

All costs incurred by the Township shall be included in the fee charged to an applicant. The fee may include, but not be limited to, costs for the following:

- A. Administrative and clerical processing, including the recording of documents.
- B. Review of the SWM Site Plan by the Township and the Township Engineer.
- C. Attendance at meetings by the Township Engineer.
- D. Preparation of agreements and other legal documents by the Township's Solicitor.
- E. Inspections by the Township Engineer during construction of SWM BMPs and related improvements.
- F. Preparation of periodic inspection reports by the Township Engineer.
- G. The final inspection upon completion of the SWM BMPs and related improvements included in the subdivision, land development, or SWM Site Plan.
- H. Preparation of a written recommendation by the Township Engineer to reduce the amount of the performance guarantee.
- I. Any additional work required to enforce any permit provisions regulated by this Ordinance, correct violations, and assure proper completion of stipulated remedial actions.

### **Section 703. Recording of Approved SWM Site Plan and Related Agreements**

At the developer's/landowner's expense, the Township shall record the following documents in the Office of the Recorder of Deeds of Lebanon County, within fifteen (15) days of approval of the SWM Site Plan by the Township:

- A. The SWM Site Plan.
- B. Stormwater Management Best Management Practices (BMP) Operations and Maintenance (O&M) Agreement and Developer's Improvement Guarantee Agreement.
- C. Any deed restrictions, covenants or easements that run with the land.

#### **Section 704. Amendments**

Amendments to this Ordinance may be initiated by South Lebanon Township. If the amendments are initiated by the Board of Supervisors, the proposed amendment or amendments shall be submitted to the Planning Commission and Township Engineer for review and comment at least thirty (30) days prior to a public hearing. Before enactment of a proposed amendment or amendments, the Board of Supervisors shall hold a public hearing thereon pursuant to public notice.

## ARTICLE VIII. PROHIBITIONS

### Section 801. Prohibited Discharges and Connections

- A. Any drain or conveyance, whether on the surface or subsurface, that allows any non-stormwater discharge including, but not limited to, sewage, process wastewater and wash water to enter the regulated municipal separate storm sewer system (MS4) or to enter the waters of this Commonwealth is prohibited.
- B. No person shall allow, or cause to allow, discharges into the regulated MS4, or discharges into waters of this Commonwealth, which are not composed entirely of stormwater, except as provided in Subsection C below and 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 regulated MS4 or to the waters of the Commonwealth:
  - 1. Discharges or flows from firefighting activities.
  - 2. Discharges from potable water sources including water line flushing and fire hydrant flushing if such discharges do not contain detectable concentrations of Total Residual Chlorine (TRC).
  - 3. Non-contaminated irrigation water, water from lawn maintenance, landscape drainage and flows from riparian habitats and wetlands.
  - 4. Diverted stream flows and springs.
  - 5. Non-contaminated pumped ground water and water from foundation and footing drains and crawl space pumps.
  - 6. Non-contaminated HVAC condensation and water from geothermal systems.
  - 7. Residential (i.e., not commercial) vehicle wash water where cleaning agents are not utilized.
  - 8. Non-contaminated hydrostatic test water discharges if such discharges do not contain detectable concentrations of TRC
- D. In the event that the Township or DEP determines that any of the discharges identified in Subsection C above significantly contribute pollutants to the regulated MS4 or to the waters of the Commonwealth, the Township, or DEP will notify the responsible person(s) to cease the discharge.

### Section 802. Roof Drains and Sump Pumps

For new construction, roof drains and sump pumps shall not connect directly to streets, sanitary or storm sewers or roadside ditches in order to promote overland flow and infiltration/percolation of stormwater. When it is not practical for roof drains and sump pumps to discharge to vegetative areas or infiltration BMPs, the Township may permit roof drain and sump pump connections to

streets, storm sewers or roadside ditches on a case-by-case basis upon recommendation by the Township Engineer.

**Section 803. Alteration of SWM BMPs**

No person shall modify, remove, fill, landscape, or alter any SWM BMPs, facilities, areas, or structures without the written approval of South Lebanon Township, the Lebanon County Conservation District, and DEP (if DEP permit(s) applies).

## **ARTICLE IX. ENFORCEMENT AND PENALTIES**

### **Section 901. Right of Entry**

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

### **Section 902. Notification**

In the event that a person fails to comply with the requirements of this Ordinance or fails to conform to the requirements of any permit issued hereunder, the Township shall provide written notification of the violation. Such notification shall set forth the nature of the violation(s) and establish a time limit for correction of these violation(s). Failure to comply within the time specified shall subject such person to the penalty provisions of this Ordinance. All such penalties shall be deemed cumulative and shall not preclude by the Township from pursuing any and all remedies.

### **Section 903. Enforcement**

The Board of Supervisors is hereby authorized and directed to enforce all provisions of this Ordinance.

- A. It shall be unlawful for any person, firm or corporation to undertake any regulated activity except as provided for in an approved SWM Site Plan and pursuant to the requirements of this Ordinance unless specifically exempted in Section 402. It shall be unlawful to alter or remove any control structure required by the SWM Site Plan pursuant to this Ordinance or to allow the property to remain in a condition which does not conform to the approved SWM Site Plan.
- B. Suspension and revocation of Permits
  1. Any zoning, building or occupancy permit may be suspended or revoked by the Board of Supervisors for:
    - a. Non-compliance with or failure to implement any provision of an approved SWM Site Plan or O&M Agreement.
    - b. A violation of any provision of this Ordinance or any other applicable law, ordinance, rule, or regulation relating to the project.
    - c. The creation of any condition or the commission of any act during construction or development which constitutes or creates a hazard or nuisance, pollution or which endangers the life or property of others.
  2. A suspended permit shall be reinstated by the Board of Supervisors when:
    - a. The Township Engineer has inspected and approved the corrections to the stormwater management and erosion and sediment pollution control measure(s) that caused the suspension, or the elimination of the hazard or nuisance, and/or;

- b. The Board of Supervisors is satisfied that the violation of the ordinance, law, or rule and regulation has been corrected.
  - 3. If a violation causes no immediate danger to life, public health, or property, at its sole discretion, the Township may provide a limited time period for the owner to correct the violation. In these cases, the Township 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 Township may revoke or suspend any, or all, applicable approvals and permits pertaining to any provision of this Ordinance.
  - 4. A permit that has been revoked by the Board of Supervisors cannot be reinstated. The applicant may apply for a new permit under the procedures outlined in this Ordinance.
- C. It shall be unlawful to violate Section 803 of this Ordinance.

**Section 904. Public Nuisance**

- A. The violation of any provision of this ordinance is hereby deemed a Public Nuisance.
- B. Each day that a violation continues shall constitute a separate violation.

**Section 905. Penalties**

- A. Any person who or which has violated any provisions of this Ordinance, shall be guilty of a summary offense, and upon conviction by a Magisterial District Judge, shall be subject to a fine in an amount established by resolution of the Board of Supervisors for each violation, recoverable with costs and attorney's fees. Each day that the violation continues shall be a separate offense and penalties shall be cumulative.
- B. In addition, the Township, through its Solicitor, may institute any other appropriate action or proceeding at law or in equity for the enforcement of this Ordinance. Any court of competent jurisdiction shall have the right to issue restraining orders, temporary or permanent injunctions, mandamus or other appropriate forms of remedy or relief, and may impose penalties, including daily penalties for continuing violations, court costs, and reasonable attorney's fees

**Section 906. Appeals**

- A. Any person aggrieved by any action of the Township or its designee, relevant to the provisions of this Ordinance, may appeal to the Board of Supervisors within thirty (30) days of that action.
- B. Any person aggrieved by any decision of the Board of Supervisors, relevant to the provisions of this Ordinance, may appeal to the Lebanon County Court of Common Pleas within thirty (30) days of the Township decision.

## ARTICLE X. REFERENCES

1. Pennsylvania Department of Environmental Protection. Technical Guidance No. 363-0300-002 (December 2006), as amended. Pennsylvania Stormwater Best Management Practices Manual. Harrisburg, PA.
2. Pennsylvania Department of Environmental Protection. Erosion and Sediment Pollution Control Program Manual. Technical Guidance Number 363-2134-008 (March 2012), as amended. Harrisburg, PA.
3. U.S. Department of Agriculture, National Resources Conservation Service (NRCS). National Engineering Handbook. Part 630: Hydrology, 1969-2001. Originally published as the National Engineering Handbook, Section 4: Hydrology.
4. U.S. Department of Agriculture, Natural Resources Conservation Service. 1986. Technical Release 55: Urban Hydrology for Small Watersheds, 2nd Edition. Washington, D.C.
5. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, Hydrometeorological Design Studies Center. 2004-2006. Precipitation-Frequency Atlas of the United States, Atlas 14, Volume 2, Version 3.0, Silver Spring, Maryland. Internet address: <http://hdsc.nws.noaa.gov/hdsc/pfds/>.

SOUTH LEBANON TOWNSHIP STORMWATER MANAGEMENT ORDINANCE

ORDINANCE NO. 376

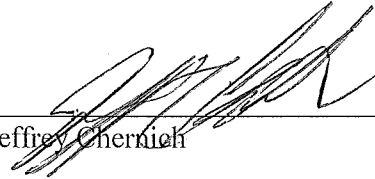
**DULY ORDAINED AND ENACTED** by the Board of Supervisors of the Township of South Lebanon, Lebanon County, Pennsylvania, on the 27<sup>th</sup> day of September, 2022 in lawful session duly assembled.

TOWNSHIP OF SOUTH LEBANON

\_\_\_\_\_  
Stephen Krause, Chairman



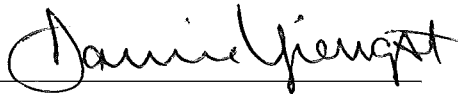
\_\_\_\_\_  
Jonathan Beers, Vice Chairman



\_\_\_\_\_  
Jeffrey Chernieh

Attest:

SEAL



\_\_\_\_\_  
Jamie Yiengst, Secretary/Treasurer

**APPENDIX A**

**CERTIFICATES OF OWNERSHIP, COMPLIANCE, REVIEW, AND APPROVAL**

**CERTIFICATE OF OWNERSHIP AND ACKNOWLEDGEMENT OF PLAN,**

**(INDIVIDUAL)**

**COMMONWEALTH OF PENNSYLVANIA**

**COUNTY OF LEBANON**

On this, the \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned officer, personally appeared \_\_\_\_\_, who being duly sworn according to law, deposes and says that he is the \* \_\_\_\_\_ of the property shown on this plan, that the plan thereof was made at his direction, that he acknowledges the same to be his act and plan, that he desires the same to be recorded, and that he acknowledges all stormwater management facilities are permanent fixtures that can be altered or removed only after approval of a revised Stormwater Management Site Plan by the Township.

\*\* \_\_\_\_\_

\*\*\* \_\_\_\_\_

My Commission Expires \_\_\_\_\_, 20\_\_\_\_

- \* Identify Ownership or Equitable Ownership
- \*\* Signature of the Individual
- \*\*\* Signature and Seal of Notary Public or Other Authorized to Acknowledge Deeds.

**CERTIFICATE OF OWNERSHIP AND ACKNOWLEDGEMENT OF PLAN,  
(PARTNERSHIP)**

**COMMONWEALTH OF PENNSYLVANIA**

**COUNTY OF LEBANON**

On this, the \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned officer, personally appeared \_\_\_\_\_, being the members of the firm of \_\_\_\_\_ who being duly sworn according to law, deposes and says that the partnership is the \* \_\_\_\_\_ of the property shown on this plan, that the plan thereof was made at its direction, that it acknowledges the same to be its act and plan, that it desires the same to be recorded, and that it acknowledges all stormwater management facilities are permanent fixtures that can be altered or removed only after approval of a revised Stormwater Management Site Plan by the Township.

\*\* \_\_\_\_\_

\*\* \_\_\_\_\_

\*\*\* \_\_\_\_\_

My Commission Expires \_\_\_\_\_, 20\_\_\_\_

- \* Identify Ownership or Equitable Ownership
- \*\* Signatures of the Partnership Members
- \*\*\* Signature and Seal of Notary Public or Other Officer Authorized to Acknowledge Deeds.

**CERTIFICATE OF OWNERSHIP AND ACKNOWLEDGEMENT OF PLAN,  
(CORPORATE)**

**COMMONWEALTH OF PENNSYLVANIA  
COUNTY OF LEBANON**

On this, the \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned officer, personally appeared \_\_\_\_\_, being \* \_\_\_\_\_ of \*\* \_\_\_\_\_ who being duly sworn according to law, deposes and says that the corporation is the \*\*\* \_\_\_\_\_ of the property shown on this plan, that he is authorized to execute said plan on behalf of the corporation, that the plan thereof was made at its direction, that it acknowledges the same to be its act and plan, that it desires the same to be recorded, and that it acknowledges all stormwater management facilities are permanent fixtures that can be altered or removed only after approval of a revised Stormwater Management Site Plan by the Township.

\*\*\*\* \_\_\_\_\_

\*\*\*\*\* \_\_\_\_\_

\*\*\*\*\* \_\_\_\_\_

My Commission Expires \_\_\_\_\_, 20\_\_\_\_

- \* Individual's Title
- \*\* Name of Corporation
- \*\*\* Identify Ownership or Equitable Ownership
- \*\*\*\* Signature of Individual
- \*\*\*\*\* Corporate Seal
- \*\*\*\*\* Signature and Seal of Notary Public or Other Officer Authorized to Acknowledge Deeds

**LICENSED PROFESSIONAL CERTIFICATION**

I hereby certify that, to the best of my knowledge, the plan shown and described hereon is true and correct and complies with the provisions of the South Lebanon Township Stormwater Management Ordinance.

\* \_\_\_\_\_ SEAL  
(Printed Name and Licensure) Date

\* Signature and seal of a qualified professional licensed in the Commonwealth of Pennsylvania qualified to perform such duties and responsible for the preparation of the plan.

**SOUTH LEBANON TOWNSHIP ENGINEER  
REVIEW CERTIFICATE**

Reviewed by the South Lebanon Township Engineer this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\* \_\_\_\_\_  
\* Signature of the South Lebanon Township Engineer.

**SOUTH LEBANON TOWNSHIP BOARD OF SUPERVISORS  
STORMWATER MANAGEMENT SITE PLAN APPROVAL CERTIFICATE**

At a meeting held on \_\_\_\_\_, 20\_\_, the Board of Supervisors of South Lebanon Township, Lebanon County, Pennsylvania approved the STORMWATER MANAGEMENT SITE PLAN for the property as shown hereon. No other Stormwater Management Site plan or plans shall be recognized. Approval includes all documentation, including the comments or requirements of official reviewing individuals or agencies. Approval is based on compliance with applicable ordinances, rules, and regulations, and shall not be construed as a guarantee to any person or organization that the design of any part of the plan will function as anticipated under any or all conditions or situations. Additionally, that by review and/or approval of the plan, the Township expressly declines the assumption of liability errors, omissions, or mistakes in judgement in the design, engineering, construction, or expected function of the matters reviewed and/or approved.

\* \_\_\_\_\_  
Chairperson – Board of Supervisors  
  
\* Signatures of the Chairperson – Board of Supervisors.

## APPENDIX B-1

### RUNOFF COEFFICIENTS “C” FOR RATIONAL FORMULA

Soil Group	A			B			C			D		
	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
<b>Land Use</b>												
<b>Cultivated</b>												
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	0.29	0.38
<b>Fallowed Fields</b>												
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
<b>Forest/Woodland</b>												
	0.08	0.11	0.14	0.10	0.14	0.18	0.12	0.16	0.20	0.15	0.20	0.25
<b>Meadow</b>												
	0.10	0.16	0.20	0.14	0.19	0.26	0.18	0.22	0.30	0.21	0.25	0.35
<b>Grass Areas</b>												
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
<b>Impervious Areas</b>												
	0.90	0.91	0.92	0.91	0.92	0.93	0.92	0.93	0.94	0.93	0.94	0.95
<b>Weighted Residential</b>												
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 B-2

### RUNOFF CURVE NUMBERS "CN" FOR SCS METHOD

(Source: 210-VI-TR-55, Second Ed., June 1986)

#### Runoff Curve numbers for urban areas

Cover description	Average percent impervious area <sup>2/</sup>	Curve numbers for hydrologic soil group			
		A	B	C	D
<b>Fully developed urban areas (vegetation established)</b>					
Open space (lawns, parks, golf courses, cemeteries, etc.) <sup>3/</sup> :					
Poor condition (grass cover < 50%) .....		68	79	86	89
Fair condition (grass cover 50% to 75%) .....		49	69	79	84
Good condition (grass cover > 75%) .....		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way) .....		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way) .....		98	98	98	98
Paved; open ditches (including right-of-way) .....		83	89	92	93
Gravel (including right-of-way) .....		76	85	89	91
Dirt (including right-of-way) .....		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) <sup>4/</sup> .....		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders) .....		96	96	96	96
Urban districts:					
Commercial and business .....	85	89	92	94	95
Industrial .....	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses) .....	65	77	85	90	92
1/4 acre .....	38	61	75	83	87
1/3 acre .....	30	57	72	81	86
1/2 acre .....	25	54	70	80	85
1 acre .....	20	51	68	79	84
2 acres .....	12	46	65	77	82
<b>Developing urban areas</b>					
Newly graded areas (pervious areas only, no vegetation) <sup>5/</sup> .....					
		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

<sup>1</sup> Average runoff condition, and  $I_a = 0.2S$ .

<sup>2</sup> The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

<sup>3</sup> CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

<sup>4</sup> Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

<sup>5</sup> Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

## Runoff Curve numbers for cultivated agricultural lands

Cover description			Curve numbers for hydrologic soil group			
Cover type	Treatment <sup>2</sup>	Hydrologic condition <sup>3</sup>	A	B	C	D
Fallow	Bare soil	—	77	86	91	94
	Crop residue cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row crops	Straight row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & terraced (C&T)	Poor	66	74	80	82
		Good	62	71	78	81
C&T+ CR	Poor	65	73	79	81	
	Good	61	70	77	80	
Small grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C&T	Poor	61	72	79	82
		Good	59	70	78	81
C&T+ CR	Poor	60	71	78	81	
	Good	58	69	77	80	
Close-seeded or broadcast legumes or rotation meadow	SR	Poor	66	77	85	89
		Good	58	72	81	85
	C	Poor	64	75	83	85
		Good	55	69	78	83
	C&T	Poor	63	73	80	83
		Good	51	67	76	80

<sup>1</sup> Average runoff condition, and  $I_a=0.2S$

<sup>2</sup> Crop residue cover applies only if residue is on at least 5% of the surface throughout the year.

<sup>3</sup> Hydraulic condition is based on combination factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes, (d) percent of residue cover on the land surface (good  $\geq 20\%$ ), and (e) degree of surface roughness.

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

## Runoff Curve numbers for other agricultural lands

Cover description	Hydrologic condition	Curve numbers for hydrologic soil group			
		A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. <sup>2</sup>	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. <sup>3</sup>	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 <sup>4</sup>	48	65	73
Woods—grass combination (orchard or tree farm). <sup>5</sup>	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. <sup>6</sup>	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 <sup>4</sup>	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

<sup>1</sup> Average runoff condition, and  $I_a = 0.2S$ .

<sup>2</sup> **Poor:** <50% ground cover or heavily grazed with no mulch.

**Fair:** 50 to 75% ground cover and not heavily grazed.

**Good:** > 75% ground cover and lightly or only occasionally grazed.

<sup>3</sup> **Poor:** <50% ground cover.

**Fair:** 50 to 75% ground cover.

**Good:** >75% ground cover.

<sup>4</sup> Actual curve number is less than 30; use CN = 30 for runoff computations.

<sup>5</sup> CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

<sup>6</sup> **Poor:** Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.

**Fair:** Woods are grazed but not burned, and some forest litter covers the soil.

**Good:** Woods are protected from grazing, and litter and brush adequately cover the soil.

## APPENDIX B-3

### ROUGHNESS COEFFICIENTS (MANNING'S "n") FOR SHEET FLOW (Source: 210-VI-TR-55, Second Ed., June 1986)

Surface description	n <sup>1</sup>
Smooth surfaces (concrete, asphalt, gravel, or bare soil) .....	0.011
Fallow (no residue) .....	0.05
Cultivated soils:	
Residue cover ≤20% .....	0.06
Residue cover >20% .....	0.17
Grass:	
Short grass prairie .....	0.15
Dense grasses <sup>2</sup> .....	0.24
Bermudagrass .....	0.41
Range (natural) .....	0.13
Woods: <sup>3</sup>	
Light underbrush .....	0.40
Dense underbrush .....	0.80

<sup>1</sup> The n values are a composite of information compiled by Engman (1986).

<sup>2</sup> Includes species such as weeping lovegrass, bluegrass, buffalo grass, blue grama grass, and native grass mixtures.

<sup>3</sup> When selecting n, consider cover to a height of about 0.1 ft. This is the only part of the plant cover that will obstruct sheet flow.

## APPENDIX B-4

### ROUGHNESS COEFFICIENTS (MANNING'S "n") FOR PIPES

PIPE MATERIAL	MANNING'S "n"
Helical corrugated steel / aluminum 2 <sup>2</sup> / <sub>3</sub> X 1 <sup>1</sup> / <sub>2</sub> corrugations Diameter (inches)	
15	0.014
18	0.015
21	0.018
24	0.017
27	0.018
30	0.019
36	0.020
42	0.021
48	0.021
Reinforced Concrete – All Diameters	0.013
Smooth Lined Corrugated Polyethylene All Diameters	0.012

## APPENDIX B-5

### CLAY LINER SPECIFICATIONS

#### 1. SCOPE

The work shall consist of the construction of the clay liner as shown on the construction plans.

#### 2. MATERIALS

Soils used in clay liner construction shall have a minimum plasticity index of 12 as tested by Atterberg Limit tests (ASTM D4318), a minimum percentage passing the number 200 sieve as specified on the construction plans, and a re-compacted in-place permeability of  $1 \times 10^{-7}$  centimeters per second or less.

Clay materials shall contain no sod, brush, roots, frozen soil, or other perishable materials. Rock particles larger than 3 inches shall be removed prior to compaction of the clay.

#### 3. FOUNDATION PREPARATION

Foundation surfaces shall be graded to remove surface irregularities and shall be scarified or otherwise acceptably scored or loosened to a minimum depth of 2 inches. The moisture content of the loosened material shall be controlled as specified for the clay liner, and the surface materials of the foundation shall be compacted and bonded with the first layer of the clay liner as specified for subsequent layers of clay liner.

#### 4. PLACEMENT

The clay liner shall not be placed until the required foundation preparation has been completed and the foundation has been inspected and approved by the Technician or Engineer. The clay liner shall not be placed upon a frozen surface, nor shall snow, ice, or frozen material be incorporated in the clay liner.

The clay liner shall be placed in lifts. The thickness of each lift before compaction shall not exceed the smaller of 6 inches or the length of the teeth of the footed compactor used.

The distribution of materials throughout the clay liner shall be essentially uniform, and the clay liner shall be free from lenses, pockets, streaks, or layers of material differing substantially in texture, moisture content, or gradation from the surrounding material.

If the surface of any layer becomes too hard and smooth for proper bond with the succeeding layer, it shall be scarified to a depth of not less than 2 inches before the next layer is placed.

#### 5. CONTROL OF MOISTURE CONTENT

During placement and compaction of the clay liner, the moisture content of the clay being placed shall be maintained above optimum moisture as determined by the Standard Proctor Test (ASTM D698) or Modified Proctor Test (ASTM D1557).

The application of water to the clay shall be accomplished at the borrow areas insofar as practicable. Water may be applied by sprinkling the clay after placement and before

compaction of the liner, if necessary. Uniform moisture distribution shall be obtained by diskings.

6. COMPACTION

The clay liner shall be compacted to a minimum of 95% of standard proctor dry density (ASTM D698) or to a minimum of 90% of modified proctor dry density (ASTM D1557), at a moisture content above optimum moisture.

The clay liner shall be compacted with a footed compactor weighing at least 25,000 pounds, operated continuously, in un-compacted lift thicknesses not to exceed the smaller of 6 inches or the length of the teeth on the footed compactor used.

7. REWORKING OR REMOVAL AND REPLACEMENT OF DEFECTIVE LINER

Clay placed at densities lower than the specified minimum density or at moisture contents lower than optimum moisture content or otherwise not conforming to the requirements of the specifications shall be reworked to meet the specifications or removed and replaced. The replacement clay and the foundation and fill surfaces upon which it is placed shall conform to all requirements of this specification for foundation preparation, approval, placement, moisture control, and compaction.

8. TESTING AND DOCUMENTATION REQUIREMENTS

Liner construction shall be tested and documented as specified below. Copies of the documentation report, including test locations and test results, shall be provided to the owner.

Field and laboratory soil tests shall be completed on the clay liner, by a third party engineering or testing firm retained by the contractor, to document compliance with this specification. Testing shall be completed as the liner is being placed. The following tests shall be completed at the specified frequency.

Standard proctor test (ASTM D698) or Modified Proctor Test (ASTM D1557)	1 per 5,000 cubic yards of clay liner 1 per 5,000 cubic yards of clay liner
ld density tests ASTM D2922, or D2937, or D2167, or D1556)	1 test per 100-foot grid per 1 foot thickness of clay liner
Atterberg Limit tests (ASTM D4318)	1 per 1,500 cubic yards of clay liner
Grain size distribution (ASTM D422)	1 per 1,500 cubic yards of clay liner
Permeability (ASTM D5084)	1 per 5,000 cubic yards of clay liner (2 minimum per facility)

Atterberg limits, grain size distribution, and permeability tests shall be completed on undisturbed samples obtained from the constructed clay liner. A minimum of one of each of the laboratory tests specified above shall be completed per clay liner.

All test holes shall be backfilled using powdered bentonite mixed with clay soil used in liner construction and compacted by hand tamping. The clay shall be broken down into clods less than ½ inch in diameter. A minimum of 25% of the backfilled test hole volume shall be occupied by powdered bentonite after backfilling.

## APPENDIX B-6

### STORMWATER MANAGEMENT SITE PLAN APPLICATION

This application shall be attached to the Preliminary Subdivision Plan, Final Subdivision Plan, Minor Subdivision Plan, Land Development Plan, or Stormwater Management Site Plan.

Application is hereby made for review of the Stormwater Management Site Plan and related data as submitted herewith in accordance with the South Lebanon Township Stormwater Management Ordinance.

Final Plan     Preliminary Plan     Land Development Plan

Minor Subdivision Plan     SWM Site Plan    (Check One)

Date of Submission \_\_\_\_\_ Submission No. \_\_\_\_\_

1. Name of subdivision or development \_\_\_\_\_

2. Name of applicant \_\_\_\_\_ Telephone No. \_\_\_\_\_

(if corporation, list the corporation's name and the names of two officers of the corporation)

\_\_\_\_\_ Officer 1

\_\_\_\_\_ Officer 2

Address \_\_\_\_\_

Applicants interest in subdivision or development \_\_\_\_\_

(if other than property owner, give owners name and address)

3. Name of property owner \_\_\_\_\_ Telephone No. \_\_\_\_\_

Address \_\_\_\_\_

4. Name of engineer, surveyor, or landscape architect \_\_\_\_\_

Telephone No. \_\_\_\_\_

Address \_\_\_\_\_

Date of site inspection by Plan Designer \_\_\_\_\_

5. Type of regulated activity proposed:

- |  |  |   |
|--|--|---|
| <input type="checkbox"/> Single-Family Lots  | <input type="checkbox"/> Townhouses        | <input type="checkbox"/> Commercial (Multi-Lot) |
| <input type="checkbox"/> Two-Family Lots     | <input type="checkbox"/> Garden Apartments | <input type="checkbox"/> Commercial (One-Lot)   |
| <input type="checkbox"/> Multi-Family Lots   | <input type="checkbox"/> Mobile-Home Park  | <input type="checkbox"/> Industrial (Multi-Lot) |
| <input type="checkbox"/> Cluster Type Lots   | <input type="checkbox"/> Campground        | <input type="checkbox"/> Industrial (One-Lot)   |
| <input type="checkbox"/> Planned Residential | <input type="checkbox"/> Institutional     | <input type="checkbox"/> Building Expansion     |
| <input type="checkbox"/> Driveway            | <input type="checkbox"/> Parking Lot       | <input type="checkbox"/> Other                  |

6. Lineal feet of new road proposed? \_\_\_\_\_ L.F.

7. Area of proposed and existing impervious surfaces on entire tract.

- a. Existing (to remain) \_\_\_\_\_ S.F. \_\_\_\_\_ % of Property
- b. Proposed \_\_\_\_\_ S.F. \_\_\_\_\_ % of Property

8. Stormwater

- a. Watershed name \_\_\_\_\_
- b. Number of subwatersheds \_\_\_\_\_
- c. Does the peak rate of runoff from proposed conditions exceed that flow which occurred for pre-development conditions for the designated design storm? \_\_\_\_\_
- d. Design storm utilized (on-site conveyance systems) \_\_\_\_\_
- e. Does the design achieve the release rate criteria for the applicable points of interest? \_\_\_\_\_
- f. Type of proposed runoff control \_\_\_\_\_
- g. Does the plan meet all the requirements of the Stormwater Ordinance? \_\_\_\_\_
- If not, what modifications/waivers are requested? \_\_\_\_\_
- \_\_\_\_\_
- Reasons Why \_\_\_\_\_
- \_\_\_\_\_
- h. Was TR-55, June 1986 utilized in determining the time of concentration? \_\_\_\_\_
- i. What hydrologic method was used in the stormwater computations? \_\_\_\_\_
- j. Is a hydraulic routing through the stormwater control structure submitted? \_\_\_\_\_
- k. Is a construction schedule or staging attached? \_\_\_\_\_
- l. Is an operation and maintenance (O&M) plan attached? \_\_\_\_\_

m. Who will have ultimate maintenance responsibility of the Stormwater Control Facilities?

\_\_\_\_\_

9. Erosion and Sediment Pollution Control (E&S):

a. Has the stormwater management and E&S plan, supporting documentation and narrative been submitted to the Lebanon County Conservation District? \_\_\_\_\_

b. Total area of earth disturbance \_\_\_\_\_ S.F.

10. Wetlands

a. Have the wetlands been delineated by someone trained in wetland delineation? \_\_\_\_\_

b. Have the wetland lines been verified by a state or federal permitting authority? \_\_\_\_\_

c. Have the wetland lines been surveyed? \_\_\_\_\_

d. Total acreage of wetland within the property \_\_\_\_\_

e. Total acreage of wetland disturbed \_\_\_\_\_

f. Supporting documentation \_\_\_\_\_

11. Filing

a. Has the required fee been submitted? \_\_\_\_\_

Amount \_\_\_\_\_

b. Has the proposed schedule of construction inspection to be performed by the applicant's engineer been submitted? \_\_\_\_\_

c. Name of individual who will be making the inspections \_\_\_\_\_

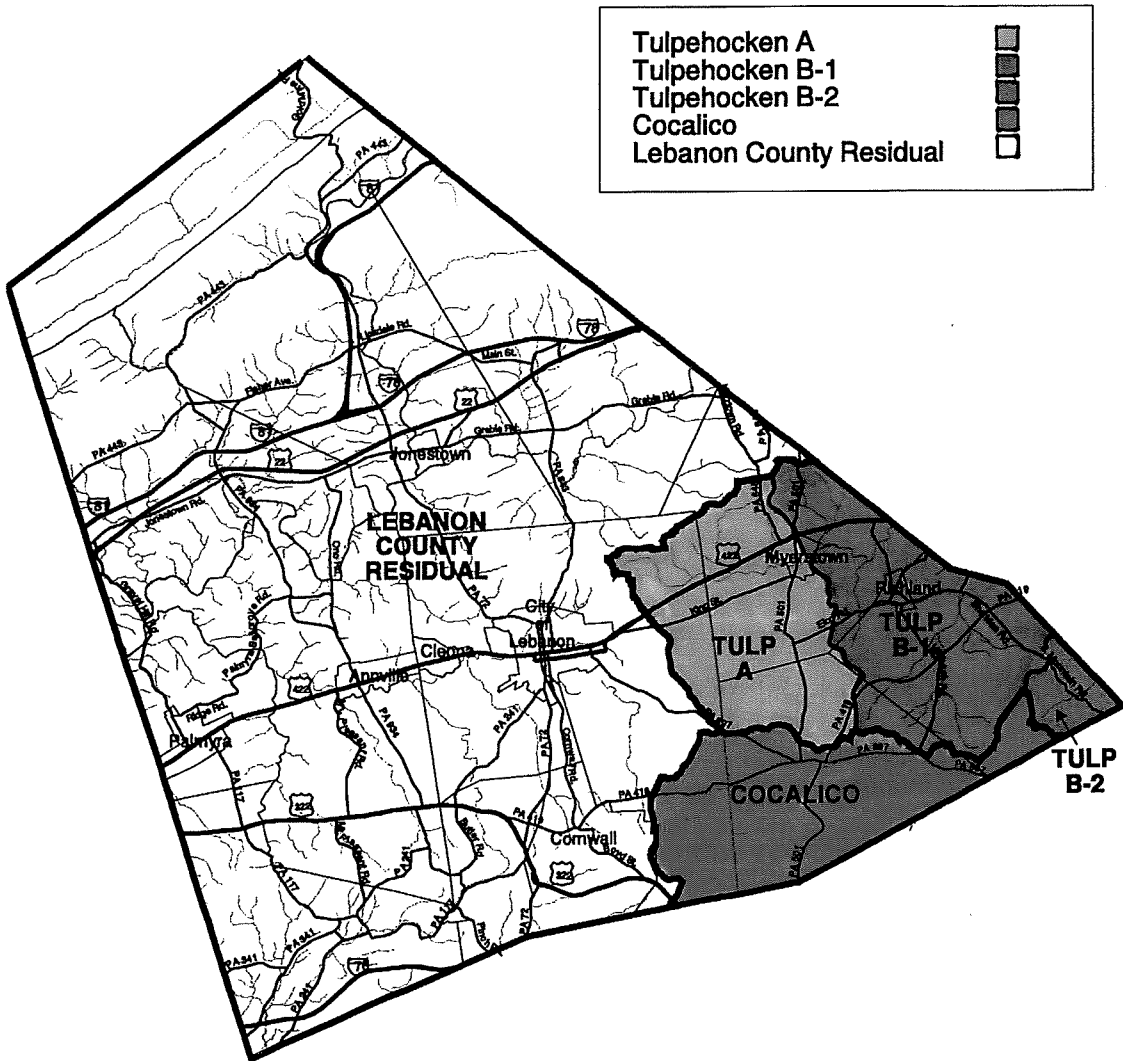
12. General comments about stormwater management at development:

\_\_\_\_\_  
\_\_\_\_\_

APPENDIX C

# LEBANON COUNTY

## Storm Water Management Districts



Tulpehocken A	■
Tulpehocken B-1	■
Tulpehocken B-2	■
Cocalico	■
Lebanon County Residual	□

Map Prepared by the Lebanon City/County GIS Department (May 2002).  
Metadata provided on request from the Lebanon City/County GIS Department.  
North American Datum of 1927 (NAD27). Projection Stateplane, Zone 5151.



## APPENDIX D

### SOUTH LEBANON TOWNSHIP – STORMWATER MANAGEMENT BEST MANAGEMENT PRACTICES (BMP) OPERATION AND MAINTENANCE (O&M) AGREEMENT

THIS AGREEMENT, made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between [name of owner/equitable owner], (hereinafter the “Landowner”), and South Lebanon Township; Pennsylvania (hereinafter “Township”);

#### WITNESSETH

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

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

WHEREAS, the Subdivision/Land Development/Stormwater Management (SWM) Site Plan (hereinafter “Plan”) for [name of owner/equitable owner] which is expressly made a part hereof, as approved or to be approved by the Township, provides for management of stormwater within the confines of the Property; and

WHEREAS, the SWM Operation and Maintenance (O&M) Plan approved by the Township (hereinafter referred to as the “O&M Plan”) for the property identified herein, which is attached hereto as Exhibit A and made part hereof, as approved by the Township, provides for management of stormwater within the confines of the Property through the use of best management practices (BMPs); and

WHEREAS, the Township and the Landowner, his successors and assigns agree that the health, safety, and welfare of the residents of the Township and the protection and maintenance of water quality require that on-site SWM Best Management Practices (BMPs) be constructed and maintained on the Property; and

WHEREAS, the Township requires, that stormwater management facilities as shown on the Plan be constructed and adequately maintained by the Landowner, his successors and assigns; and

WHEREAS, the Township requires, through the implementation of the SWM Site Plan, that SWM BMPs as required by said Plan and the Township’s Stormwater Management Ordinance be constructed and adequately operated and maintained by the Landowner, successors, and assigns.

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

1. The stormwater management BMPs shall be constructed by the Landowner, his successors, and assigns, in accordance with the terms, conditions and specifications identified in the Subdivision/Land Development/SWM Site Plan.
2. The Landowner, his successors, and assigns, shall operate and maintain the stormwater management BMPs as shown on the Subdivision/Land Development/SWM Site Plan in good

working condition in accordance with the specific operation and maintenance requirements noted in the approved O&M Plan.

3. The Landowner, his successors and assigns shall regularly inspect the SWM BMPs and maintain inspection records in accordance with the post-construction SWM BMP inspection schedule provided on the approved plan and attached hereto as Exhibit B. Inspection reports generated by the Landowner, his successors and assigns shall be submitted to the Township within 60 days of the inspection.
4. The Landowner, his successors and assigns, hereby grants permission to the Township and its authorized agents and employees, including the Township Engineer, upon presentation of proper identification, to enter upon the Property at reasonable times, and to inspect the SWM BMPs whenever deemed necessary. Whenever possible, the Township or the Township Engineer shall notify the Landowner prior to entering the Property. The purpose of the inspection is to assure safe and proper functioning of the SWM BMPs. The inspection shall cover the entire facilities, pipes, berms, outlet structures, pond areas, access roads, etc. When inspections are conducted, the Township and/or the Township Engineer shall give the Landowner, his successors and assigns, copies of the inspection report with findings and evaluations. At a minimum, this agreement grants the Township and/or the Township Engineer the right to perform inspections in accordance with the following schedule:
  - Annually for the first 5 years after the construction of the stormwater facilities,
  - Once every 3 years thereafter, or
  - During or immediately upon the cessation of a 10 year or greater precipitation event (4.6 inches of rainfall in 24 hours).
5. All reasonable costs for said inspections shall be the Landowner's, his successors' and assigns' responsibility and payable to the Township.
6. The Landowner, his successors, and assigns shall convey to the Township easements and/or rights-of-way to assure access for periodic inspections and/or maintenance, if required, by the Township and the Township Engineer.
7. In the event the Landowner, his successors and assigns fails to maintain the SWM BMPs in good working condition acceptable to the Township, the Township or its representatives may, after giving notice to the Landowner, his successors and assigns that he is not properly maintaining the SWM BMPs, and by making demand that such compliance shall be made within a specified number of days, enter upon the Property and take such necessary and prudent action to maintain said SWM BMPs and to charge the costs of the maintenance and/or repairs to the Landowner, his successors and assigns. This provision shall not be construed as to allow the Township to erect any structure of a permanent nature on the land of the Landowner, his successors and assigns outside of any drainage easement. It is expressly understood and agreed that the Township is under no obligation to maintain, or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the Township.
8. The Landowner, his successors, and assigns, will perform maintenance in accordance with the maintenance schedule for the SWM BMPs including sediment removal as outlined on the approved schedule and/or Subdivision/Land Development/SWM Site Plan.
9. In the event the Township, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like on account of the Landowner's or his successors' and assigns' failure to perform such work,

the Landowner, his successors and assigns, shall reimburse the Township upon demand, within 10 days of receipt of invoice thereof, for all costs incurred by the Township hereunder. If not paid within said 10-day period, the Township may enter a lien against the property in the amount of such costs or may proceed to recover his costs through proceedings in equity or at law as authorized under the provisions of the Second-Class Township Code.

10. The Landowner, his successors, and assigns, shall indemnify the Township and their agents and employees, against any and all damages, accidents, casualties, occurrences or claims, which might arise or be asserted against the Township for the construction, presence, existence or maintenance of the stormwater management facilities by the Landowner, his successors and assigns.
11. In the event a claim is asserted against the Township, its agents or employees, the Township shall promptly notify the Landowner, his successors, and assigns, and they shall defend, at their own expense, any suit based on such claim or action. If any judgment, decree or claim against the Township, its agents or employees shall be granted, the Landowner, his successors and assigns shall pay all costs and expenses in connection with said judgment, decree or claim including any attorney fees, costs and expenses incurred in the defense of the Township.
12. In the advent of an emergency or the occurrence of special or unusual circumstances or situations, the Township may enter the Property, if the Landowner, his successors, and assigns is not immediately available, without notification or identification, to inspect and perform necessary maintenance and repairs, if needed, when the health, safety or welfare of the citizens is at jeopardy. However, the Township shall notify the landowner, his successors and assigns of any inspection, maintenance, or repair undertaken within five (5) days of the activity. The Landowner, his successors and assigns shall reimburse the Township for any associated costs.
13. The intent and purpose of this Agreement is to ensure the proper maintenance of the onsite BMPs by the Landowner, his successors, and assigns; provided, however, that this Agreement shall not be deemed to create or affect any additional liability of any party for damage alleged to result from or be caused by stormwater runoff.
14. The Landowner, its executors, administrators, assigns, and other successors in interests, shall release and hold harmless the Township from all damages, accidents, casualties, occurrences, or claims which might arise or be asserted against said Township employees and representatives from the construction, presence, existence, or maintenance of the SWM BMP(s) by the Landowner, his successors and assigns or the Township.
15. **The Landowner, his successors, and assigns, shall disclose the terms and conditions of this Agreement to any subsequent successors, and assigns prior to the sale and/or transfer of the property.**

**This Agreement shall be recorded among the land records of Lebanon County, Pennsylvania and shall constitute a covenant running with the Property and/or equitable servitude, and shall be binding on the Landowner, his administrators, executors, assigns, heirs and any other successors in interests, in perpetuity.**

ATTEST:

WITNESS the following signatures and seals:

(SEAL)

For South Lebanon Township:

\_\_\_\_\_

(SEAL)

For the Landowner:

\_\_\_\_\_

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

GIVEN UNDER MY HAND THIS \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_

**NOTARY PUBLIC**

(SEAL)

## APPENDIX E

### STANDARD STORMWATER MANAGEMENT NOTES

Use all applicable notes and supplement or revise where necessary for clarification:

1. All stormwater management facilities shown on this plan shall be constructed by the developer in accordance with the design, conditions and specifications identified on this plan. Ownership and maintenance shall be the responsibility of the landowner, his successors, and assigns, unless specifically identified otherwise herein.
2. Stormwater management facilities shall be maintained in good working condition so that they are performing their design function, in a manner acceptable to South Lebanon Township, as required by South Lebanon Township Stormwater Management Ordinance. Maintenance shall include performing routine maintenance and repair or replacement of damaged facilities, vegetation, or stormwater areas to conditions as shown on the approved plan and in accordance with South Lebanon Township Stormwater Management Ordinance.
3. Any drainage and utility easements shown on the plan shall be constructed, owned, and maintained in accordance with the approved plan and shall be referenced within the property deed.
4. Runoff from the lot improvements shall be directed to the stormwater management facilities. Stormwater runoff from existing natural swales and/or other existing drainage conveyors shall not be directed towards or intercepted by the stormwater management facilities.
5. Township Officials and their agents or employees have the right of access for inspection and, in cases of construction default, construction of the stormwater management facilities.
6. Contact South Lebanon Township at (717) 274-0481 prior to construction to coordinate inspections of stormwater management facilities by the Township Engineer. No occupancy is permitted until stormwater management facilities have been installed and approved through inspection by the Township Engineer.

*Note: Where facilities such as new streets with storm sewers and related structures are intended for ownership and maintenance by the Township, Homeowner's Association, or similar organization, additional notes shall be provided to document ownership and maintenance responsibilities.*

### STORMWATER EXEMPTIONS

Use the following note instead of the 6 standard stormwater notes:

Lot #(s) \_\_\_\_\_ has (have) been exempted from the mandatory design and installation of stormwater management facilities, based upon satisfaction of the exemption criteria with Section 402 of South Lebanon Township Stormwater Management Ordinance. No occupancy is permitted until Lot #(s) \_\_\_\_\_ has (have) been inspected and approved by the Township Engineer (717) 274-0481 to verify that construction and development has been completed in accordance with this plan and Section 402 criteria.

## APPENDIX F

### EROSION AND SEDIMENT POLLUTION CONTROL GUIDELINES

#### INTRODUCTION

Pennsylvania law requires an Erosion and Sediment Pollution Control (E&SPC) plan be developed and implemented for all earthmoving activities. The following guidelines are to be incorporated into an E&SPC plan for projects that do not have an existing plan. **The guidelines alone do not constitute a complete plan.** The E&SPC plan must be fully developed and site specific in accordance with Pennsylvania Department of Environmental Protection Chapter 102 rules and regulations. Additional information regarding E&SPC development and Chapter 102 regulations may be obtained from the Lebanon County Conservation District.

#### PROCEDURE

The following list of E&SPC guidelines shall be used as standard notes on all plans. Subdivision and Land Development Plans and SWM Site Plans also require site specific E&SPC design sheets, details, and construction sequence.

#### GUIDELINES

1. A logical construction sequence shall be developed that includes the installation of E&SPC facilities, and Best Management Practices (BMPs), before earthmoving may commence.
2. E&SPC facilities and BMPs shall be correctly installed and maintained. Maintenance information and construction details may be obtained from the Lebanon County Conservation District.
3. Earth disturbance shall take place within a defined limits of disturbance and immediately prior to construction.
4. Development plans shall preserve salient natural features, minimize land cuts and fills and conform to the general topography. Plans shall be designed and implemented so as to create the least potential for erosion and to adequately contain the volume and reduce the velocity of surface water runoff.
5. Natural vegetation shall be retained, protected, and supplemented prior to and during construction.
6. Topsoil shall be removed from construction areas and stockpiled for final grading and seedbed preparation. Downslope areas of any stockpiles, construction or borrow areas shall be protected with correctly installed and maintained silt fence, straw bales, or sediment traps prior to any earth disturbance in order to minimize sediment laden runoff.
7. All cuts and fills shall be brought to final grade early in the construction sequence and stabilized immediately with seed and mulch.
8. Only driveway excavations that can be stabilized with a crushed stone base the same day shall be completed.
9. Current regulations state: *(a) Upon completion of an earth disturbance activity or any stage or phase of an activity, the site shall be immediately seeded, mulched, or otherwise protected from accelerated erosion and sedimentation. (b) Erosion and sediment control BMPs shall be implemented and maintained until the permanent stabilization is completed. (c) For an earth disturbance activity or any stage or phase of an activity to be considered permanently stabilized, the disturbed areas shall be covered with one of the following: (1) A minimum uniform 70%*

*perennial vegetative cover, with a density capable of resisting accelerated erosion and sedimentation. (2) An acceptable BMP which permanently minimizes accelerated erosion and sedimentation.*

10. The Penn State *Erosion Control & Conservation Plantings on Noncropland guide or Agronomy guide* shall be consulted for permanent and temporary seeding and mulching types and rates. (Straw mulch shall be applied at a rate of at least 3 tons per acre or 5 bales per 1000 square feet. Slopes steeper than 3:1 shall be correctly lined with appropriate turf reinforcement matting.) Other helpful publications include *Turfgrass Establishment* (special Circular 163), *Turfgrass Seed and Seed Mixtures* (extension circular 391), and *Principles of Turfgrass Irrigation* (special circular 158). The publications referenced are available from the Penn State Extension Office.
11. All recycling and disposal of construction waste shall be in accordance with local and state rules and regulations for waste management. Construction waste includes but is not limited to: Excess soil and rock, building materials, concrete and concrete wash water, sanitary waste and any other materials that could adversely impact surface or ground water quality.

## APPENDIX G

### POST CONSTRUCTION STORMWATER MANAGEMENT (PCSM) STANDARD NOTES

#### PCSM Requirements

A licensed professional or a designee shall be present onsite and be responsible during critical stages of implementation of the approved PCSM Plan. The critical stages may include the installation of underground treatment or storage BMPs, structurally engineered BMPs, or other BMPs as deemed appropriate by the Department or the conservation district.

The PCSM Plan, inspection reports, and monitoring records shall be available for review and inspection by the Department or the conservation district.

#### PCSM Long Term Operations and Maintenance Requirements

The permittee or co-permittee shall be responsible for long-term operation and maintenance of PCSM BMPs unless a different person is identified in the notice of termination and has agreed to long-term operation and maintenance of PCSM BMPs.

A permittee or co-permittee that fails to transfer long-term operation and maintenance of the PCSM BMP or otherwise fails to comply with this requirement shall remain jointly and severally responsible with the landowner for long-term operation and maintenance of the PCSM BMPs located on the property.

#### Permit Termination

Upon permanent stabilization of the earth disturbance activity and installation of BMPs in accordance with an approved plan, the permittee or co-permittee shall submit a notice of termination to DEP or the Lebanon County Conservation District. The notice of termination must include:

- (1) The facility name, address, and location
- (2) The operator name and address
- (3) The NPDES permit number
- (4) The reason for permit termination
- (5) Identification of the persons who have agreed to and will be responsible for long-term operation and maintenance of the PCSM
- (6) Copy of Legal Instrument: For any property containing a PCSM BMP, the permittee or co-permittee shall record an instrument with the recorder of deeds which will assure disclosure of the PCSM BMP and the related obligations in the ordinary course of a title search of the subject property. The recorded instrument must identify the PCSM BMP, provide for necessary access related to long-term operation and maintenance for PCSM BMPs and provide notice that the responsibility for long-term operation and maintenance of the PCSM BMP is a covenant that runs with the land that is binding upon and enforceable by subsequent grantees, and provide proof of filing with the notice of termination.
- (7) Final certification: The permittee shall include with the notice of termination "Record Drawings" with a final certification statement from a licensed professional, which reads as follows:

*"I (name) do hereby certify pursuant to the penalties of 18 Pa. C.S.A. §4904 to the best of my knowledge, information and belief, that the accompanying record drawings*

*accurately reflect the as-built conditions, are true and correct, and are in conformance with Chapter 102 of the rules and regulations of the Department of Environmental Protection and that the project site was constructed in accordance with the approved PCSM Plan, all approved plan changes and accepted construction practices.”*

- (1) The permittee shall retain a copy of the record drawings as a part of the approved PCSM Plan.
- (2) The permittee shall provide a copy of the record drawings as part of the approved PCSM Plan to the person identified in this section as being responsible for the long-term operation and maintenance of the PCSM BMPs.

