LehmanTownship

Stormwater Management

Ordinance

Pike County, Pennsylvania

As Adopted by the Lehman Township Board of Supervisors
on
6 October 2005

This Ordinance was prepared under the
direction of the Lehman Township Planning Commission.

Ordinance Number 104

Lehman Township, Pike County, Pennsylvania
Stormwater Management Ordinance Amendment
Ordinance No. 112

AN ORDINANCE OF LEHMAN TOWNSHIP, PIKE COUNTY, PENNSYLVANIA, AMENDING THE LEHMAN TOWNSHIP STORMWATER MANAGEMENT ORDINANCE, ORDINANCE No. 104.

NOW, THEREFORE, BE IT ORDAINED AND ENACTED by the Board of Supervisors of Lehman Township, Pike County, Pennsylvania, and it is hereby ordained and enacted by the authority of the same:

SECTION 1: The definition of Land Disturbance is hereby amended as follows:

Delete the word "filling" which directly follows the word "grading".

SECTION 2: The definition of Special Protection Waters is hereby amended as follows:

Special Protection Waters - Watersheds for which the receiving waters are designated as exceptional value (EV) or high quality (HQ) streams, pursuant to PA Title 25, Chapter 93, Water Quality Standards.

SECTION 3: Section 301.5 is hereby amended as follows:

301.5 All stormwater management methods, including outlet locations, are subject to approval by the Township. Where appropriate, approval by the PCCD and PADEP is required.

SECTION 4: Section 302.3b is hereby amended as follows:

302.3b Runoff coefficients (c) for both existing and proposed conditions using the Rational Method shall be obtained from Table 3.2 of this Ordinance.

SECTION 5: Delete APPENDIX C, STORMWATER MANAGEMENT PLAN APPLICATION.

SECTION 6: Delete Stormwater Plan, Proposed Schedule of Fees.

SECTION 7: Rename APPENDIX A, APPLICATION FOR REVIEW OF A STORMWATER

MANAGEMENT PLAN as APPENDIX C, STORMWATER MANAGEMENT PLAN APPLICATION.

SECTION 8: Rename APPENDIX B, STORMWATER MANAGEMENT SUBMISSION REPORT as APPENDIX D, STORMWATER MANAGEMENT REPORT.

SECTION 9: Rename APPENDIX D, STANDARD STORMWATER FACILITIES MAINTENANCE AND MONITORING AGREEMENT as APPENDIX E, STANDARD STORMWATER FACILITIES MAINTENANCE AND MONITORING AGREEMENT.

SECTION 10: Section 404.3 shall be amended as follows:

404.3 All applications for plan review shall be made on forms supplied by the Township. The Applicant shall submit completed copies of Appendix C, Stormwater Management Plan Application and Appendix D, Stormwater Management Report.

SECTION 11: Section 603.2 is hereby amended as follows:

603.2 A legally binding agreement (Appendix E, Standard Stormwater Facilities Maintenance and Monitoring Agreement) between the entity and the Township shall be executed, providing for the maintenance of all permanent control facilities, and allowing inspections by the Township of all such facilities deemed critical to the public welfare, at any reasonable time.

SECTION 12: All Ordinances or parts of Ordinances inconsistent herewith are hereby repealed.

SECTION 13: This Ordinance shall take effect five (5) days after its enactment.

ORDAINED AND ENACTED into an Ordinance this 2nd day of April, 2008.

TOWNSHIP OF LEHMAN

(TOWNSHIP SEAL)

JOHN P. SIVICK, Chairman

RICHARD C. VOLLMER, Supervisor

Attest:
ROBERT H. ROHNER, Jr.
Secretary

PAUL D. MENDITTO, Supervisor

LEHMAN TOWNSHIP
STORMWATER MANAGEMENT ORDINANCE

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LEHMAN TOWNSHIP
STORMWATER MANAGEMENT ORDINANCE

ARTICLE I
GENERAL PROVISIONS

Section 101 Statement of Findings

The Lehman Township Board of Supervisors finds that:

The inadequate management of accelerated stormwater runoff, resulting from development, increases flood flows and velocities; contributes to erosion and sedimentation; overtaxes the carrying capacity of streams and storm sewers; greatly increases the cost of public facilities to carry and control stormwater; undermines flood plain management and flood control efforts in downstream communities; reduces groundwater recharge; poses a threat to surface and groundwater quality; and threatens public health and safety.

A comprehensive program of stormwater management, including reasonable regulation of development and activities causing accelerated erosion, is fundamental to the public health, safety and welfare of the people of the Township and to the protection of their resources and the environment.

Through project design, impacts from stormwater runoff can be minimized to maintain the natural hydrologic regime and to sustain high water quality, groundwater recharge, stream baseflow and aquatic ecosystems. The most cost effective and environmentally advantageous way to manage stormwater runoff is through nonstructural project design, minimizing impervious surfaces and sprawl, avoiding sensitive areas (i.e. stream buffers, floodplains, steep slopes), and designing to the topography and soils to maintain the natural hydrologic regime.

Section 102 Short Title

This Ordinance shall be known as and may be cited as the "Lehman Township Stormwater Management Ordinance".

Section 103 Purpose

The purpose of this Ordinance is to promote public health, safety and welfare by minimizing stormwater damages through provisions designed to:

a. Control accelerated runoff and erosion and sedimentation problems at their source, by regulating those activities which cause serious problems.

b. Utilize and preserve the existing, natural drainage systems.

c. Encourage the recharge of groundwaters.

d. Maintain the existing flows and quality of waters in the Township.

e. Preserve and restore the flood carrying capacity of streams.

f. Provide for the maintenance of all stormwater management structures, constructed in the Township.

Section 104 Statutory Authority

The Township is empowered to regulate these activities by the authority of the Pennsylvania Municipalities Planning Code (Act of 1968, P.L. 805, No. 247, as amended), the Pennsylvania Storm Water Management Act (Act of 1978, P.L. 864, No. 167, as amended), the Pennsylvania Second Class Township Code (Act of 1933, P.L. 103, No. 69, as amended), the Clean Streams Law (35 P.S. §§691.1-691.1001) and the Clean Water Act (33 U.S.C. §§1251).

Section 105 Applicability

The following activities are included within the scope of this Ordinance:

a. Land Development;

b. Subdivision;

c. Earth Disturbance, involving 10,000 or more square feet;

d. Agricultural Operations;

e. Forest Management Operations;

f. Nursery Operations;

g. Diversion or piping of any natural or man-made stream channel;

h. Installation of stormwater facilities or appurtenances thereto;

k. Mining Operations.

Section 106 Repealer

All other Township Ordinances or parts thereof inconsistent with any of the provisions of this Ordinance are hereby repealed to the extent of the inconsistency.

Section 107 Severability

The provisions of this Ordinance shall be severable and should any section or provision of this Ordinance be declared invalid by a court of competent jurisdiction, such decision shall not affect the validity of any of the remaining provisions of this Ordinance.

Section 108 Conflict with Other Regulations

Permits and approvals issued pursuant to this Ordinance do not relieve the Applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable Ordinance. If more stringent requirements concerning the regulation of stormwater or erosion and sedimentation control are contained in the Ordinance or any other regulations, the more stringent regulation shall apply.

ARTICLE II
DEFINITIONS

Section 201 Interpretation

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

a. Words used in the present tense include the future tense; the singular number includes the plural, and the plural number includes the singular; words of masculine gender include 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, unit of government, 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."

Section 202 Definitions

Applicant - A landowner or developer, who has filed an application under the provisions of this Ordinance, including his heirs, successors or assigns.

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

Alteration - As applied to land, a change in topography as a result of moving soil and rock from one location to another. Also the changing of surface conditions by causing the surface to be more or less impervious.

Bankfull - The channel at the top-of-bank or point where water begins to overflow onto a floodplain.

Base Flow - The portion of stream flow that is sustained by groundwater discharge.

Bio-retention - A stormwater retention area which utilizes woody and herbaceous plants and soils to remove pollutants before infiltration occurs.

BMP (Best Management Practice) - Stormwater structures, facilities and techniques to control, maintain or improve the quantity and quality of surface runoff and groundwater recharge.

Channel Erosion - The widening, deepening and headward cutting of small channels and waterways, caused by stormwater runoff or bankfull conditions.

Cistern - An underground reservoir or tank for storing rainwater.

Conservation District - The Pike County Conservation District.

Conveyance Facility - A stormwater management facility designed to transmit stormwater runoff and shall include channels, swales, pipes, conduits, culverts, storm sewers, etc.
County - Pike County, Pennsylvania.

Culvert - A pipe, conduit or similar structure including appurtenant works which carries surface water.

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

Design Storm - The magnitude of precipitation from a storm event measured in probability of occurrence (e.g., 25-year storm) and duration (e.g., 24-hour), and used in computing stormwater management control systems.

Detention Basin - A basin designed to retard stormwater runoff by temporarily storing the runoff and releasing it at a predetermined rate. A detention basin can be designed to drain completely after a storm event, or it can be designed to contain a permanent pool of water.

Developer - Any landowner, agent of such landowner or tenant with the permission of such landowner, who undertakes the activities covered by this Ordinance.

Diffused Drainage Discharge - Drainage discharge not confined to a single point location or channel, such as sheet flow or shallow concentrated flow.

Disturbed Areas - Unstabilized land area where an earth disturbance activity is occurring or has occurred.

Diversion Terrace - A channel and a ridge constructed to a predetermined grade across a slope, and designed to collect and divert runoff from slopes which are subject to erosion.

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

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

Earth Disturbance Activity - A construction or other human activity which disturbs the surface of the land, including but not limited to, clearing and grubbing, grading, excavations, embankments, land development, agricultural plowing or tilling, timber harvesting activities, road maintenance activities, mineral extraction, and the moving, depositing stockpiling or storing of soils, rock or earth materials.

Emergency Spillway - A conveyance in natural ground that is used to pass a peak discharge greater that the maximum design storm controlled by the stormwater facility.

Encroachment - A structure or activity that changes, expands or diminishes the course, current or cross section of a watercourse, floodway or body of water.

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

Erosion and Sediment Control Plan - A site specific plan that is designed to minimize accelerated erosion and sedimentation during construction.

Exceptional Value Waters - Surface waters of high quality which satisfy Pennsylvania Code Title 25 Environmental Protection, Chapter 93, Water Quality Standards, §93.4b(b) (relating to anti-degradation).

Existing Conditions - The initial condition of a project site prior to the proposed alteration.

Forest Management Operations - All activities connected with the growing and harvesting of forest products including site preparation, cultivation and logging of trees, and the construction and maintenance of roads for such purposes.

Freeboard - A vertical distance between the elevation of the design high water and the top of a dam, levee, tank, basin, swale or diversion berm.

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 Pennsylvania Code Title 25 Environmental Protection, Chapter 93, Water Quality Standards, §93.4b(a).

Hydrologic Regime (natural) - The hydrologic cycle or balance that sustains quality and quantity of stormwater, baseflow, storage and groundwater supplies under natural conditions.

Hydrologic Soil Group - A classification of soils by the Natural Resources Conservation Service, formerly the SCS, into four potential groups. The groups range from A soils, which are very permeable and produce little runoff, to D soils, which are not very permeable and produce much runoff.

Impervious Surface - A surface which prevents the percolation of water into the ground.

Infiltration - For stormwater to pass through the soil from the surface.

Infiltration Structures - A structure designed to direct runoff into the ground; e.g. french drains, seepage pits, seepage trench, recharge basins.

Inlet - The upstream end of any structure through which water may flow.

Land Development

A. The improvement of one lot or two or more contiguous lots, tracts or parcels of land for any purpose involving:

1. A group of two or more residential or nonresidential buildings, whether proposed initially or cumulatively, or a single nonresidential building on a lot or lots regardless of the number of occupants or tenure; or

2. The division or allocation of land or space, whether initially or cumulatively, between or

3. Among two or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups or other features.

B. A subdivision of land.

Land Disturbance - Any activity involving grading, filling, digging or filling of ground, or stripping of vegetation, or any other activity which causes land to be exposed to the danger of erosion.

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

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, U.S. Department of Agriculture.

Nursery - A tract of land on which trees and plants are raised or stored for transplanting and sale.

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

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

Outlet - Points of water disposal from a stream, river, lake, tidewater or artificial drain.

PADEP - The Pennsylvania Department of Environmental Protection.

PCCD - The Pike County Conservation District.

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

PennDot - The Pennsylvania Department of Transportation.

Pipe - A culvert, closed conduit or similar structure that conveys stormwater.

Planning Commission - The Lehman Township Planning Commission.

Pre-development - The undeveloped, natural condition.

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

Recharge Area - Undisturbed surface area or depression where stormwater collects, and a portion of which infiltrates and replenishes the groundwater.

Retention Basin - A structure in which stormwater is stored and not released during the storm event. Retention basins do not have an outlet other the recharge and must infiltrate stored water in no more than four (4) days.

Return Period - The average interval, in years, within which a storm event of a given magnitude can be expected to recur. For example, the 25 year return period rainfall would have a four (4%) percent chance of occurring any given year.

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

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

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

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

Sediment Pollution - The placement, discharge or any other introduction of sediment into the waters of the Commonwealth.

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

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

Semi-Pervious Surface - A surface such as stone, rock, concrete or other materials which permits some vertical transmission of water.

Sheet Flow - Runoff that flows over the ground as a thin, even layer.

Soil-Cover Complex Method - A method of runoff computation developed by SCS, and found in its publication "Urban Hydrology for Small Watersheds", Technical Release No. 55, SCS, January 1975.

Special Protection Waters - Watersheds for which the receiving waters are exceptional value (EV) or high quality (HQ) streams.

Spillway - A conveyance that is used to pass the peak discharge of the maximum design storm controlled by the stormwater facility.

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. See Return Period.

Storm Sewer - A system of pipes or other conduits which carries intercepted surface runoff, street water and other runoff, or drainage, but excludes domestic sewage and industrial wastes.

Stormwater - The total amount of precipitation reaching the ground surface.

Stormwater Management Facility - Any structure, natural or man-made, that due to its condition, design or construction conveys, stores or otherwise affects the stormwater runoff

quality and quantity. Typical stormwater management facilities include, but are not limited to, detention and retention basins, open channels, storm sewers, pipes and infiltration structures.

Stream Buffer - The land area adjacent to each side of a stream, essential to maintaining water quality, measured from the top of bank.

Stream Enclosure - A bridge, culvert or other structure in excess of 100 feet in length, which encloses a regulated water of the Commonwealth.

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 division of land including changes in existing lot lines for the purpose, whether immediate or future, of lease, transfer of ownership or building or lot development: provided, however, that the division of land for agricultural purposes into parcels of more than ten acres, not involving any new street or easement of access, shall be exempt.

Supervisors - The Lehman Township Board of Supervisors.

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

Time of Concentration (Tc) - The time for surface runoff to travel from the hydraulically most distant point of the watershed to a point of interest within the watershed. This time is the combined total of overland flow time and flow time in pipes or channels, if applicable.

Township - Lehman Township, Pike County, Pennsylvania.

Township Engineer - The Professional Engineer appointed by the Township Supervisors to perform all duties required of the Township Engineer by the provisions of this Ordinance.

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

ARTICLE III
STORMWATER MANAGEMENT REQUIREMENTS

Section 301 General Requirements

301.1 Stormwater runoff from a site, during and following construction, shall not occur at a peak rate greater than which occurred prior to development.

301.2 Stormwater runoff from a site shall be controlled using an appropriate means of stormwater management. Underground systems will be favorably considered.

301.3 Stormwater runoff that is detained, shall be released at a controlled rate by appropriately installed devices. The release shall be in the same manner as the natural or pre-development means of discharge from a site; i.e. point discharge or sheet flow.

301.4 Stormwater runoff shall not be increased or redirected in a manner that results in a hazard to persons or property.

301.5 All stormwater management methods, including outlet locations, are subject to approval by the Township.

301.6 All lots shall be laid out and graded to prevent cross lot drainage, to provide positive drainage away from existing and proposed building locations, as well as away from primary or reserve on-lot sewage systems.

301.7 Stormwater management plans shall take into account and provide for existing flows from upstream drainage areas.

301.8 Existing points of natural drainage onto adjacent properties shall not be altered to increase flows or change the type of flow (sheet or concentrated) without the written approval of all affected landowners.

301.9 Applicants shall demonstrate that all possible Best Management Practices have been employed to reduce the stormwater volume leaving the property to the maximum extent possible.

301.10 Stormwater runoff and watercourses shall not be diverted so that existing drainage systems are overloaded, flooding is created or additional drainage structures are required on other properties.

301.11 Natural streams, channels, drainage systems or areas of surface water concentration shall be maintained in their natural condition unless an alteration is approved by the Township. All encroachment activities shall comply with PADEP Chapter 105 regulations, where applicable.

301.12 Stormwater facilities located on a state highway right-of-way shall be subject to approval by PennDOT.

301.13 No substantial grading shall occur, no building permits shall be issued, and no street or parking lot construction shall be permitted until all designed and approved detention basins, siltation basins or improved drainage swales are constructed and stabilized.

301.14 Adequate erosion protection shall be provided along all swales and at all drainage facilities.

301.15 All stormwater management facilities shall be designed to incorporate sound engineering principles and practices. The Township reserves the right to disapprove any design that results in the construction or continuation of a stormwater problem.

301.16 The Supervisors may approve or require innovative methods of stormwater management, based upon the review and recommendation of the Township Engineer.

301.17 Although the Township regulates storms having a 1, 2 and 25 year return period, the Designer must be cognizant of the rights of lower riparian property owners. Land disturbance, in conjunction with storms having longer return periods may have an impact on downstream owners that has not been reviewed by the Township. It is the sole responsibility of the upstream owner to insure that his land disturbance operations do not have an adverse impact on the downstream owner for all ranges of storms.

Section 302 Design Criteria

302.1 Computation Methodology

a. Stormwater runoff from sites within a drainage area, greater than 200 Acres, shall be calculated using a generally accepted calculation technique based on the NRCS Soil Cover Complex method. Table 3.1 summarizes acceptable computation methods. The method selected by the design professional shall be based on individual limitations and the suitability of a given method for a particular site. The Rational Method may be used to calculate peak flows from drainage areas, less than 200 Acres.

b. Calculations using the Soil Cover Complex Method shall use a 24 hour rainfall distribution. Calculations using the Rational Method shall use a 1 hour rainfall distribution.

302.2 Return Periods

a. All stormwater conveyance facilities shall be designed to convey a 25 year storm. This includes all inlets, culverts, swales, storm sewers and outlets.

b. All storm runoff shall be managed such that peak post-development flows do not exceed peak pre-development flows for both the 2 year and 25 year storms.

c. The peak post development flow shall also be limited to the peak pre development flow for the 1 year, 24 hour storm. Flows must be retained and released so that 90% of the total volume is retained for a minimum of 18 hours. If the above requirement results in a discharge orifice being smaller than 3 inches in diameter, the retention period shall be waived so that 3 inches will be the minimum size used.

d. Conveyance facilities in a regulated flood plain area must be designed to pass the 100 year storm.

e. Emergency spillways shall be provided on all ponds and basins and shall be designed to safely pass the 100 year storm. All downstream conveyance facilities from such pond or basin shall also be designed to pass a 100 year storm.

302.3 Runoff Coefficients

a. Runoff coefficients (CN) for both existing and proposed conditions using the Soil Cover Complex Method shall be obtained from the PADEP "Erosion and Sediment Pollution Control Program Manual".

b. Runoff coefficients © for both existing and proposed conditions using the Rational Method shall be obtained from Table 3.2 of this Ordinance.

c. The use of runoff coefficients, other than those listed above, may be permitted by the Township; provided that they are fully justified by a competent professional.

302.4 Time of Concentration

a. Time of concentration shall be calculated using the procedures set forth in SCS TR-55 (1986 Edition).

b. Times of concentration will consist of sheet flow, shallow concentrated flow and/or channel flow, as appropriate.

302.5 Rainfall

a. Rainfall amounts have been developed from "Recommended Hydrologic Procedures for Computing Urban Runoff from Small Watersheds in Pennsylvania", PADEP, January 1982 and shall be used for all runoff calculations. Rainfall amounts are set forth in Table 3.3.

b. U.S. Weather Bureau/U.S. Army Corp of Engineers standard rainfall

intensity-duration curves shall be used to develop storm intensity-duration-frequency curves of 1 hour rainfall for use in the Township. Curve values are provided in Table 3.4.

c. The SCS Type II Curve shall be used for rainfall distribution of a 24 hour storm.

Section 303 Construction Standards

303.1 General

a. All storm drainage and control facilities shall be designed and constructed in accordance with PADEP and/or PennDOT standards and specifications. The following published standards and specifications, in their most recent revision, shall be used:

PennDOT, Form 408, Specifications
PennDOT, RC Series, Roadway Construction Standards
PADEP, Erosion and Sediment Pollution Control Program Manual

b. Where conflicts occur between sources, the most stringent requirements shall apply, unless specifically altered by the Township.

c. All bridges shall be constructed to PennDOT standards. PADEP permitting and approval shall be required for all waterway crossings, where required.

303.2 Swales

a. All swales shall be designed and constructed to limit erosion and sedimentation. Designs shall conform to the provisions established in the PADEP "Erosion and Sediment Pollution Control Program Manual", dated March 2000, or as revised.

b. The Mannings Formula shall be used to calculate the velocity and carrying capacity of a swale. Manning's values shall be selected from the above cited reference and will be subject to approval by the Township Engineer.

c. All swales shall provide a minimum freeboard of 0.5 feet

303.3 Culverts and Storm Sewers

a. Drainage pipes shall be constructed of corrugated metal, concrete or appropriate plastic pipe. All corrugated metal pipes shall be galvanized and fully coated with bituminous material.

b. The minimum pipe size for drainage facilities shall be 15 inches in diameter.

c. Drainage pipes shall have a minimum slope of one-half percent (0.5%).

d. All open ended pipes must be fitted with concrete endwalls or prefabricated end sections. All endwalls or end sections shall be constructed and installed in accordance with PennDOT standards.

e. Manholes or inlets shall be used at all changes in horizontal alignment, at changes in vertical alignment and at all pipe junctions. No run of pipe shall exceed 400 feet in length, without appropriate measures to provide cleanout.

f. Trash racks shall be provided at all stormwater entrance structures.

g. Appropriate safety grates shall be attached to all catch basins, inlets, pipe openings and other stormwater receiving structures, as required, to ensure that maximum openings do not exceed 25 square inches. Along streets and within other pedestrian areas, bicycle safe grates shall be used on all inlets.

h. All inlets shall have weep holes covered with geotextile fabric to provide for complete drainage of the inlet.

i. Inlets over 4 feet in depth shall have ladder rungs.

j. All culverts and inlet structures shall be sized so that the calculated headwater for the design storm does not flood the adjacent roadway. All such structures shall maintain a 0.5 foot freeboard between the headwater and the edge of the shoulder. Flooded areas on adjacent lots or property created by these headwaters will be shown as inundated areas on all plans.

k. All stormwater outfalls shall be designed so that the elevation of the receiving waters, during a 25 year storm event, does not inundate the invert of the outfall sewer. In instances, where the outfall discharges to a regulated 100 year flood plain, such discharge point shall be above the elevation of a 100 year storm event.

l. Storm sewers shall be designed to convey a 10 year storm without surcharging inlets.

m. An adequate storm sewer consisting of inlets and underground drainage pipes with approved outlets shall be constructed where stormwater runoff and erosion control cannot be accomplished satisfactorily by surface drainage facilities.

303.4 Detention Basins

a. Perforated risers, staggered orifices, v-notch weirs, or other outlet control structures may be required for necessary outflow control.

b. All detention basins shall be designed with an emergency spillway. The spillway shall provide a minimum freeboard of 1.0 foot when passing the 100 year storm. Emergency spillways must discharge on to natural ground.

c. All outfall structures shall be suitably lined to prevent erosion.

d. Where the outfall discharges to a point where flow is normally not concentrated, the point of discharge shall be at least 50 feet from a downslope property line, unless written permission is obtained from the adjacent land owner.

e. Where the discharge is to be spread into sheet flow, the allowable flow rate shall be determined by the pre development flow for a 2 year storm across the length of the spreader.

f. Basins shall generally not exceed 4 feet in total depth. The side slopes shall not exceed a maximum grade of 4 horizontal to 1 vertical. Grading shall avoid a uniform "engineered appearance" and shall use contour grading to appear as a natural landform. Basin depths shall be measured from the maximum water elevation to the lowest elevation of the basin.

g. Anti-seep collars and cutoff walls shall be required when berms exceed 5 feet in height. Watertight anti-seep collars shall be installed around discharge pipes at intervals not to exceed 24 feet and shall extend a minimum of 2 feet beyond the outside of the pipe.

h. All detention basin outlet structures shall be designed with a control device that permits modification to regulate the outflow. Anti-vortex and trash racks are required.

i. A minimum grade of 1.0 percent shall be maintained across the basin floor and directed towards the outlet structure. A lesser grade may be permissible provided a paved low flow channel is provided.

j. The minimum top width of all dams and embankments are as follows:

Height	Top Width
0' - 3'	4'
3' - 5'	6'
5' - 15'	8'

k. The design top elevation of all dams and embankments, after all settlement has taken place, shall be equal to the maximum water surface elevation in the basin resulting from the routed 100 year storm, plus 12 inches. Therefore, the design height of the dam or embankment, defined as the vertical distance from the top down to the bottom of the deepest cut, shall be increased by the amount needed to ensure that the design top elevation will be maintained following all settlement. This increase shall not be less than 5%.

l. All earth shall be free from brush, roots and other organic material subject to decomposition.

m. The fill material in all earth dams and embankments shall be compacted to at least 95% of the maximum density obtained from compaction tests performed by the appropriate method in ASTM D698. Results of the compaction tests shall be supplied to the Township.

n. Basins not having direct access to a public street shall be provided with a 15 foot access driveway to a public street to provide for maintenance.

o. Portions of stormwater basins that are visible from streets and dwellings shall be attractively maintained. The Applicant shall submit a written description of the maintenance that will be required. The Township may require the establishment of an escrow account to assist in funding the maintenance for any basin that the Township may agree to accept responsibility for.

p. All wet basin designs shall incorporate biological controls to control the West Nile virus.

q. Any stormwater controls that require a dam safety permit under PADEP Chapter 105 shall be subject to approval by PADEP.

r. All designs shall be verified by routing the design storms through the stormwater detention facilities using the Storage Indication Method.

s. Conveyance facilities entering or exiting a stormwater facility shall be designed to convey the design flows to and from that structure.

303.5 Retention Basins, Trenches and Drywells

a. In general, all runoff control measures shall be designed to encourage groundwater recharge, where suitable conditions prevail. However, proper precautions shall be taken to prevent pollution of the groundwater, whenever used.

b. Groundwater recharge shall be fully considered when soils belong to either Hydrologic Group A or B. When soils belong to Hydrologic Group C, the hydraulic conductivity of the soil and the depth to any limiting zone should be considered. For the most part, soils in Hydrologic Group D are not suitable for groundwater recharge.

c. A separation of 3 feet shall be provided between the lowest point of a recharge facility and a limiting zone consisting of a high water table or bedrock.

d. Retention basins shall meet the same standards as a detention basin.

e. Water quality BMP's shall be provided prior to infiltration.

Section 304 Best Management Practices (BMP), Infiltration and Stormwater Quality

Methods of stormwater management that encourage groundwater recharge, minimize impervious coverage and filter pollutants from runoff shall be required by the Board of Supervisors, where determined by the Township Engineer to be feasible.

304.1 BMP devices include seepage beds, seepage trenches, infiltration trenches, underground detention basins and similar devices. These types of devices or their equivalent shall be used where soil conditions are suitable. These devices may allow smaller detention facilities.

304.2 For examples, review the manual entitled "Best Management Practices for Developing Areas in Pennsylvania", available through the County Conservation District. Stormwater infiltration shall meet the standards of such Manual or an alternate standard acceptable to the Township Engineer.

304.3 To increase the effectiveness of infiltration devices, the following shall apply:

a. Areas proposed for infiltration devices shall be protected from sedimentation and compaction during the construction phase to maintain their maximum infiltration capacity.

b. Infiltration devices shall not receive runoff until the entire contributing drainage area has been stabilized.

304.4 Where ground water recharge is proposed, the Township Engineer may require a geologic study to determine site suitability for such facilities. The study should address soil permeability, depth to bedrock, susceptibility to sinkholes, and subgrade stability.

304.5 Where pervious surfaces are proposed to encourage groundwater recharge, pavement construction specifications shall be stated on the plan and be subject to approval of the Township Engineer.

304.6 Within new subdivisions and land developments, the Township shall require that a one year, 24 hour design storm be detained so that it takes a minimum of 18 hours to drain runoff from the facility. The release of water begins at the start of the storm. The design of the facility shall consider and minimize the chances of clogging from sediment.

304.7 The use of alternative Best Management Practices shall consider the following:

a. The total contributing area.

b. The permeability and infiltration rate of the soils.

c. The slope and depth of bedrock.

d. The seasonally high water table.

e. The proximity to building foundations and wellhead areas.

f. The erosion potential of soils.

g. The land availability and topography.

304.8 The Township may require the installation of oil separators and similar devices to separate pollutants from stormwater runoff.

304.9 The Township may require the planting of thick vegetation along waterways to filter pollutants from runoff.

ARTICLE IV
PLAN REQUIREMENTS

Section 401 General Requirements

Prior to the final approval of subdivision and land development plans, or the issuance of any permit, or the commencement of any land disturbance activity, the owner, subdivider, developer or his agent shall submit a Stormwater Management Plan to the Township for approval.

Section 402 Exemptions

Although these activities are exempt from the plan preparation requirements of the Stormwater Ordinance, they must otherwise manage stormwater in the manner specified in the Ordinance.

The following activities are specifically exempt from the plan preparation provisions of this Ordinance.

a. Land disturbances affecting less than 10,000 square feet of ground surface.

b. Land disturbance, affecting less than 20,000 square feet of ground surface, associated with existing one and two family dwellings.

c. Use of land for gardening for home consumption.

d. Agriculture when operated in accordance with a conservation plan or erosion and sedimentation control plan prepared by the Conservation District.

e. Forest management operations which are following the Department of Environmental Protection's management practices contained in its publication "Soil Erosion and Sedimentation Control Guidelines for Forestry" and are operating under an erosion and sedimentation control plan.

Section 403 Plan Contents

The following items, where appropriate, shall be included in the plan:

403.1 General

a. General description of project.

b. General description of erosion and sedimentation controls.

c. General description of stormwater controls, during and after development.

d. Expected project time schedule, including anticipated start and completion dates.

e. Training and experience of person preparing the plan.

403.2 Map(s) of the project area showing:

a. The location of the project relative to highways, municipalities or other identifiable landmarks.

b. Existing contours at intervals of two (2) feet. In areas of steep slopes (greater than 25%), five-foot contour intervals may be used.

c. Streams, lakes, ponds or other bodies of water within the project area, or which will be affected by runoff from the project.

d. Other physical features including existing drainage swales and areas of natural vegetation to be preserved.

e. Locations of proposed underground utilities, sewers and water lines.

f. An overlay showing soil types and boundaries.

g. Proposed changes to land surface and vegetative cover.

h. Areas to be cut or filled.

i. Proposed structures, roads, paved areas and buildings.

j. Final contours at intervals of two (2) feet. In areas of steep slopes (greater than 25%), five-foot contour intervals may be used.

403.3 Erosion and sedimentation controls

a. The staging of all earthmoving activities must be described, including cuts and fills, streets, underground utilities, sewer and water lines, buildings, driveways, parking areas, recreational areas, other structures, etc.

b. The type, location and extent of all erosion and sedimentation control measures must be shown on a map and described, including all calculations, assumptions and criteria sued in designing the controls, and a schedule for their implementation.

403.4 Stormwater management controls

a. All stormwater management controls must be shown on a map and described, including:

1) Groundwater recharge methods such as seepage pits, beds or trenches. When these structures are used, the locations of septic tank infiltration areas and wells must be shown.

2) Other control devices or methods such as roof-top storage, semi-pervious paving materials, grass swales, parking lot ponding, vegetated strips, detention or retention ponds, storm sewers, etc.

3) Schedule for installation of the control measures and devices.

b. All calculations, assumptions and criteria used in the design of the control device or method must be shown.

403.5 Maintenance Program - A maintenance program for all stormwater management control facilities must be included. This program must include the proposed ownership of the control facilities and detail the financial responsibility for any required maintenance.

Section 404 Plan Submission

404.1 The plan shall be accompanied by a fee, established by the Township covering costs for plan reviews, plan action, and inspections. Fees shall be established by a resolution of the Board of Supervisors. Plans will not be considered complete until all fees have been paid.

404.2 Five (5) copies of the completed plan must be submitted.

404.3 All applications for plan review shall be made on forms supplied by the Township.

Section 405 Plan Approval

405.1 The Applicant shall forward a copy of the plan to the County Planning Commission and the County Conservation District for review, concurrent with the submission to the Township.

405.2 The Township Engineer and Planning Commission shall review the plan and comments from the County Conservation District and County Planning Commission and shall recommend whether the plan be approved or disapproved.

405.3 The Township shall notify the applicant within 90 days from receipt of a complete plan submission of its decision.

404.4 A disapproval shall contain the reasons for disapproval and a listing of the plan deficiencies.

404.5 Failure of the municipality to render a decision within the 90 day time limit shall be deemed an approval.

405.6 Stormwater plans for subdivisions and land developments shall be processed and acted upon by the Township concurrently with the associated subdivision and land development plans.

Section 406 Modification of Plans

A modification to an approved stormwater management plan which involves a change in control methods or techniques, or which involves the relocation or redesign of control measures, or which is necessary because soil or other condition are not as stated on the approved application, shall be approved under the procedures contained in Section 405 of this ordinance. The Township Engineer shall notify the Applicant when such plan modification is required.

Section 407 Expiration and Renewal

407.1 Approval of a stormwater plan shall expire 24 months from the date of plan approval, unless construction is commenced prior to this date.

407.2 A renewal of an expired stormwater approval may be issued by the Township following a resubmittal of the permit application form, and its approval by the Township Engineer.

407.3 Any refusal by the Township to reissue an expired stormwater approval shall contain the reasons for such refusal.

Section 408 Suspension and Revocation

408.1 Any approval issued under this Ordinance may be suspended or revoked by the municipality for:

a. Non-compliance with or failure to implement any provision of the plan.

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, or which endangers the life or property of others.

408.2 A suspended approval shall be reinstated by the Township when:

a. The Township Engineer has inspected and approved the corrections to the stormwater management control measures, or the elimination of the hazard or nuisance.

b. The Township is satisfied that the violation of the ordinance, law, or rule and regulation has been corrected.

408.3 An approval which has been revoked by the Township cannot be reinstated. The Applicant may apply for a new permit under the procedures outlined in this Ordinance.

ARTICLE V
INSPECTIONS

Section 501 Schedule of Inspections

501.1 The Township Engineer shall inspect all phases of installation for permanent stormwater facilities, as he deems appropriate.

501.2 It is the responsibility of the permittee to notify the Township Engineer 48 hours in advance of the completion of any identified phase of development.

501.3 During any stage of work, if the Township Engineer determines that the stormwater facilities are not being installed in accordance with the approved Stormwater Plan, the Township shall revoke any existing permits or other approvals and issue a cease and desist order until a revised Stormwater Plan is submitted and approved, as specified in this Ordinance.

501.4 A final inspection of all stormwater facilities shall be conducted by the Township Engineer to confirm compliance with the approved Stormwater Plan prior to the issuance of any Occupancy Permit.

ARTICLE VI
FINANCIAL GUARANTEES AND MAINTENANCE

Section 601 Performance Guarantees

601.1 For subdivisions and land developments, the Applicant shall provide a financial guarantee to the Township for the timely installation and proper construction of all stormwater controls in the amount and method of payment provided for in the Subdivision and Land Development Ordinance.

601.2 For other Regulated Activities, the Township may require a financial guarantee from the Applicant.

601.3 At the completion of the project, and as a prerequisite for the release of the performance guarantee, the Applicant or his representatives shall:

a. Provide a certification of completion from an engineer, architect, surveyor or other qualified person verifying that all permanent facilities have been constructed according to the plans and specifications and approved revisions thereto.

b. Provide a set of as-built drawings.

601.4 After the Township receives the certification, a final inspection shall be conducted by the Township Engineer to certify compliance with this Ordinance.

Section 602 Maintenance Responsibilities

602.1 The Stormwater Plan for the development site shall contain an operation and maintenance plan prepared by the Applicant and approved by the Township. The operation and maintenance plan shall outline required routine maintenance actions and schedules necessary to insure proper operation of the facility.

602.2 The Stormwater Plan shall establish responsibilities for the continuing operation and maintenance of all proposed stormwater control facilities, consistent with the following principles:

a. If a development consists of structures or lots which are to be separately owned and in which streets, sewers or other public improvements are to be dedicated to the Township, stormwater control facilities may also be dedicated to and maintained by the Township. The Township is not obligated to accept ownership.

b. If a development site is to be maintained in a single ownership or if streets, sewers or other public improvements are to be privately owned and maintained, then the ownership and maintenance of stormwater control facilities may be the responsibility of the

Applicant or a private management entity.

602.3 The governing body, upon recommendation of the Township Engineer, shall make the final determination on the continuing maintenance responsibilities prior to approval of the Stormwater Plan. The governing body reserves the right to accept the ownership and operating responsibility for any and all of the stormwater management controls.

602.4 If the Township determines at any time that any permanent stormwater management control facility has been eliminated, altered or improperly maintained, the owner of the property shall be advised of corrective measures required and given a reasonable period of time to take necessary action. If such action is not taken by the property owner, the Township may cause the work to be done and lien all costs against the property.

Section 603 Maintenance By Private Entity

603.1 In cases where permanent control facilities are owned by a private entity (such as a homeowner's association), such entity shall be responsible for maintenance.

603.2 A legally binding agreement (Appendix D) between the entity and the Township shall be made providing for maintenance of all permanent control facilities, and allowing inspection by the Township of all such facilities deemed critical to the public welfare at any reasonable time.

Section 604 Maintenance By Individual Lot Owners

When stormwater management control measures are located on an individual lot, and when they are the responsibility of that landowner to maintain, a description of the facility or system and the terms of the required maintenance shall be incorporated as part of the deed to the property.

Section 605 Township Stormwater Maintenance Fund

605.1 Persons installing stormwater storage facilities shall be required to pay a specified amount to the Township Stormwater Management Fund to help defray costs of periodic inspections and maintenance expenses. The amount of the deposit shall be determined as follows:

a. If the storage facility is to be privately owned and maintained, the deposit shall cover the cost of periodic inspections performed by the Township for a period of ten (10) years, as estimated by the Township Engineer. After that period of time, inspections will be performed at the expense of the Township.

b. If the storage facility is to be owned and maintained by the Township, the

deposit shall cover the estimated costs for maintenance and inspections for ten (10) years. The Township Engineer will establish the estimated costs utilizing information submitted by the Applicant.

c. The amount of the deposit to the fund shall be converted to present worth of the annual series values. The Township Engineer shall determine the present worth equivalents, which shall be subject to the approval of the governing body.

605.2 If a storage facility is proposed that also serves as a recreation facility (e.g., ballfield, lake), the Township may reduce or waive the amount of the maintenance fund deposit based upon the value of the land for public recreation purpose.

605.3 If at some future time a storage facility (whether publicly or privately owned) is eliminated due to the installation of storm sewers or other storage facility, the unused portion of the maintenance fund deposit will be applied to the cost of abandoning the facility and connecting to the storm sewer system or other facility. Any amount of the deposit remaining after the costs of abandonment are paid will be returned to the depositor.

605.4 Long-Term Maintenance - The Township may require applicants to pay a fee to the Township Stormwater Maintenance Fund to cover long term maintenance of stormwater control and best management practices.

605.5 Stormwater Related Problems - The Township may require applicants to pay a fee to the Township Stormwater Management Fund to cover stormwater related problems which may arise from the land development and earth disturbance.

ARTICLE VII
ENFORCEMENT AND PENALTIES

Section 701 Right-of-Entry

Upon presentation of proper credentials, duly authorized representatives of the Township may enter a property at reasonable times to inspect the condition of the stormwater structures and facilities in regard to any aspect regulated by this Ordinance.

Section 702 Notification

In the event that a person fails to comply with the requirements of this Ordinance, or fails to conform to the requirements of a permit issued thereunder, the Township shall provide written notification of the violation. Such notification shall set forth the nature of the violation, the section of the Ordinance violated and shall establish a time limit for correction of the violation. 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 prevent the Township from, pursuing any and all remedies. It shall be the responsibility of the Owner of the real property on which any regulated activity is occurring or is proposed to occur, to comply with the provisions of this Ordinance.

Section 703 Enforcement

The Township governing body is hereby authorized and directed to enforce all of the provisions of this Ordinance. All inspections regarding compliance with the Stormwater Plan shall be the responsibility of the Township Engineer or other qualified persons designated by the Township.

703.1 Design Plans - A set of design plans approved by the Township shall be on file at the site throughout the duration of the construction activity. Periodic inspections may be made by the Township during construction.

703.2 Adherence to Approved Plan - It shall be unlawful for any person, firm or corporation to undertake any activity regulated under Section 105 of this Ordinance except as provided for in an approved Stormwater Plan and pursuant to the requirements of this Ordinance. It shall be unlawful to alter or remove any control structure required by the Stormwater Plan pursuant to the Ordinance or to allow the property to remain in a condition which does not conform to the approved Stormwater Plan.

703.3 Hearing - Prior to revocation or suspension of a permit and at the request of the Applicant, the governing body shall schedule a hearing to discuss the non-compliance if there is no immediate danger to life, public health or property. Such notice shall be provided to the Applicant in writing. At the hearing, the Applicant shall be given an opportunity to provide

testimony on his own behalf. The burden of proof to show cause why the permit should not be revoked or suspended lies with the Applicant. The expense of a hearing shall be the Applicant's responsibility.

703.4 Occupancy Permit - An occupancy permit shall not be issued unless the certification of completion pursuant to Section 601.3 has been approved by the Township. The occupancy permit shall be required for each lot owner and Applicants for all subdivisions and land developments in the Township.

Section 704 Public Nuisance

704.1 The violation of any provision of this Ordinance is hereby deemed a Public Nuisance.

704.2 Each day that a violation continues shall constitute a separate violation.

Section 705 Penalties

705.1 Anyone violating the provisions of this Ordinance shall be subject to a fine of not more than $ 500.00 for each violation, recoverable with costs, including reasonable Municipal Attorneys fees. Each day that a violation continues shall be a separate offense. Jurisdiction shall be before a District Justice.

705.2 In addition, the Township may institute injunctive, mandamus or any other appropriate action or proceeding at law or in equity for the enforcement of this Ordinance. Any court of competent jurisdiction shall have the right to issue restraining orders, temporary or permanent injunctions, mandamus or other appropriate forms of remedy or relief.

Section 706 Appeals

706.1 Any person aggrieved by any action of the Township or its designee may appeal to the Township's governing body within thirty (30) days of that action.

706.2 Any person aggrieved by any decision of the Township's governing body may appeal to the Court of Common Plea's in the County where the activity has taken place within thirty (30) days of the Township decision.

APPENDIX A
REFERENCES

Stormwater management and erosion and sedimentation control publications.

1. Chapter 102. Erosion Control, Title 25, Rules and Regulations of the Department of Environmental Protection.

2. Chapter 105. Water Obstructions and Encroachments, Title 25, Rules and Regulations of the Department of Environmental Protection.

3. Engineering Field Manual for Conservation Practices, 1975, U.S. Department of Agriculture, Soil Conservation Service.

4. Erosion and Sediment Control Handbook, Pike County Conservation District.

5. Guidelines for Stormwater Management, Department of Environmental Protection, Bureau of Watershed Management.

6. Soil Erosion and Sedimentation Control Manual, Department of Environmental Protection, Bureau of Watershed Management and Bureau of Water Supply and Wastewater Management.

7. Urban Hydrology for Small Watersheds, Technical Release No. 55, Soil Conservation Service, U.S. Department of Agriculture, June 1986.

8. Recommended Hydrologic Procedures for Computing Urban Runoff from Small Watersheds in Pennsylvania, Institute for Research on Land and Water Resources, Pennsylvania State University, January 1982.

APPENDIX B
TABLES

Table 3.1
Acceptable Computation Methodologies for Stormwater Management Plans

Method	Method Developed By	Applicability
TR-20 (or commercial computer package based on TR-20)	USDA NRCS	Applicable where use of full hydrology computer model is desirable or necessary.
TR-55 (or commercial computer package based on TR-55)	USDA NRCS	Applicable for land development plans within desired limitations described in TR-55
HEC-1 / HEC-HMS	US Army Corps of Engineers	Applicable where use of full hydrologic computer model is desirable or necessary.
PSRM	Penn State University	Applicable where use of a hydrologic computer model is desirable or necessary; simpler than TR-20 or HEC-1.
Rational Method (or commercial computer package based on Rational Method)	Emil Kuichling (1889)	For sites less than 200 acres, or as approved by the Municipality and/or Municipal Engineer
Other Methods	Varies	Other computation methodologies approved by the Township.

Table 3.2
Runoff Coefficients for the Rational Method

Hydrologic Groups	A			B			C			D		
Slopes / Land Use	0 - 2%	2 - 6%	6% +	0 - 2%	2 - 6%	6% +	0 - 2%	2 - 6%	6% +	0 - 2%	2 - 6%	6% +
Cultivated Land	0.14	0.18	0.22	0.16	0.21	0.28	0.20	0.25	0.34	0.24	0.29	0.41
Pasture	0.15	0.25	0.37	0.23	0.34	0.45	0.30	0.42	0.52	0.37	0.50	0.62
Meadow	0.14	0.22	0.30	0.20	0.28	0.37	0.26	0.35	0.44	0.30	0.40	0.50
Forest	0.08	0.11	0.14	0.10	0.14	0.18	0.12	0.16	0.20	0.15	0.20	0.25
Residential Lot Size 1/8 Acre	0.33	0.37	0.40	0.35	0.39	0.44	0.38	0.42	0.49	0.41	0.45	0.54
Lot Size 1/4 Acre	0.30	0.34	0.37	0.33	0.37	0.42	0.36	0.40	0.47	0.38	0.42	0.52
Lot Size 1/3 Acre	0.28	0.32	0.35	0.30	0.35	0.39	0.33	0.38	0.45	0.36	0.40	0.50
Lot Size 1/2 Acre	0.25	0.29	0.32	0.28	0.32	0.36	0.31	0.35	0.42	0.34	0.38	0.48
Lot Size 1 Acre	0.22	0.26	0.29	0.24	0.28	0.34	0.28	0.32	0.40	0.31	0.35	0.46
Industrial	0.85	0.85	0.86	0.85	0.86	0.86	0.86	0.86	0.87	0.86	0.86	0.88
Commercial	0.88	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.90	0.89	0.89	0.90
Streets	0.76	0.77	0.79	0.80	0.82	0.84	0.84	0.85	0.89	0.89	0.91	0.95
Open Space	0.11	0.16	0.20	0.14	0.19	0.26	0.18	0.23	0.32	0.22	0.27	0.39
Parking	0.95	0.96	0.97	0.95	0.96	0.97	0.95	0.96	0.97	0.95	0.96	0.97

Source: Recommended Hydrologic Procedures for Computing Urban Runoff from Small Watersheds in Pennsylvania." Institute for Research on Land and Water Resources, Pennsylvania State University. January 1982.
(after Rawls et al, 1981)

Table 3.3
Rainfall Amount (Inches)
for Lehman Township

Return Period	Duration	
	1 hr	24 hr
1 yr	0.66	1.90
2 yr	1.40	3.30
5 yr	1.89	4.22
10 yr	2.29	4.98
25 yr	2.78	5.90
50 yr	3.17	6.61
100 yr	3.53	7.29

Table 3.4
Intensity - Duration - Frequency Chart
for Lehman Township

Duration	Return Period						
	1 Yr	2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
5	3.02	4.99	6.11	6.95	7.93	8.67	9.34
10	2.33	4.03	5.01	5.76	6.64	7.32	7.92
15	1.89	3.38	4.26	4.94	5.75	6.37	6.93
20	1.59	2.91	3.72	4.34	5.09	5.66	6.19
25	1.36	2.56	3.30	3.88	4.58	5.12	5.61
30	1.19	2.29	2.97	3.52	4.17	4.68	5.14
35	1.05	2.07	2.71	3.22	3.83	4.32	4.76
40	0.94	1.89	2.49	2.97	3.56	4.02	4.44
45	0.85	1.74	2.30	2.76	3.32	3.76	4.16
50	0.78	1.61	2.15	2.58	3.11	3.54	3.92
55	0.71	1.50	2.01	2.43	2.94	3.34	3.71
60	0.66	1.40	1.89	2.29	2.78	3.17	3.53
70	0.57	1.24	1.69	2.06	2.52	2.88	3.22
80	0.50	1.12	1.53	1.88	2.31	2.65	2.97
90	0.45	1.01	1.40	1.73	2.13	2.45	2.76
100	0.40	0.93	1.29	1.60	1.98	2.29	2.58
110	0.37	0.86	1.20	1.49	1.85	2.15	2.42
120	0.34	0.80	1.12	1.40	1.74	2.03	2.29
135	0.30	0.72	1.02	1.28	1.61	1.87	2.12
150	0.27	0.66	0.94	1.18	1.49	1.74	1.98
165	0.24	0.60	0.87	1.10	1.39	1.63	1.85
180	0.22	0.56	0.81	1.03	1.30	1.53	1.75
210	0.19	0.49	0.71	0.91	1.16	1.37	1.57
240	0.16	0.43	0.64	0.82	1.05	1.25	1.44

APPENDIX C
STORMWATER MANAGEMENT PLAN APPLICATION

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

Date of Submission _____

1. Name of Subdivision or Development _____

2. Name of Applicant _____ Telephone No._____

   (if corporation, list corporation's name and the names of two officers of the corporation)
   _____ Officer 1
   _____ Officer 2

   Address _____
   Zip _____

   Applicants interest in subdivision or development _____

3. Name of Property Owner _____ Telephone No._____

   Address _____
   Zip _____

4. Name of Engineer or Surveyor _____ Telephone No._____

   Address _____
   Zip _____

5. Type of Subdivision or Development proposed:

____ Single-Family Lots	____ Townhouses	____ Commercial (Multi-Lot)
____ Two Family Lots	____ Garden Apartments	____ Commercial (One-Lot)
____ Multi-Family	____ Mobil-Home Park	____ Industrial (Multi-Lot)
____ Cluster Type Lots	____ Campground	____ Industrial (One-Lot)
____ Planned Residential Development	____ Other (_____)	

6. Lineal feet of new road proposed _____ L.F.

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

   a. Existing _____ S.F. _____ % of Property
   b. Proposed _____ S.F. _____ % of Property

8. Stormwater

   a. Does the peak rate of runoff from the proposed conditions exceed that flow which occurred for pre-development conditions for the designated design storm? _____

   b. Design storm utilized (24 hr) _____
   Rainfall Amount _____
   Watershed Name _____

   c. Does the submission meet the release rate criteria for the applicable subarea? _____

   d. Type of proposed runoff control _____

   e. Does the proposed stormwater control criteria meet the requirement/guidelines of the Stormwater Ordinances? _____

   If not, what variances/waivers are requested? _____
   _____
   Attach copy of variance request with reasons.

   f. Does the plan meet the requirements of Article III of the Stormwater Ordinances? ____

   If not, what variances/waivers are requested? _____
   _____
   Attach copy of variance request with reasons.

   g. Was TR-55, June 1986 utilized in determining the time of concentration? _____

   h. What hydrologic method was used in the stormwater computations? _____

   i. Is a hydraulic routing through the stormwater control structure submitted? _____

   j. Is a construction schedule or staging attached? _____

   k. Is a recommended maintenance program attached? _____

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 Pike 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. Has supporting documentation been submitted? _____

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 _____

d. General comments about stormwater management at the development _____

_____

_____

_____

CERTIFICATE OF OWNERSHIP AND ACKNOWLEDGMENT OF APPLICATION:

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF PIKE

On this the _____ day of _____ , 20____ , before me, the undersigned officer, personally appeared _____ who being duly sworn, according to law, deposes and says that _____ owners of the property described in this application and that the application was made with _____ knowledge and/or direction and does hereby agree with the said application and to the submission of the same.

_____ Property Owner

My Commission Expires _____ 20____
Notary Public _____

THE UNDERSIGNED HEREBY CERTIFIES THAT TO THE BEST OF HIS KNOWLEDGE AND BELIEF THE INFORMATION AND STATEMENTS GIVEN ABOVE ARE TRUE AND CORRECT.

SIGNATURE OF APPLICANT _____

(Information Below This Line To Be Completed By The Township)

Lehman Township official submission receipt:

Date complete application received _____ Plan Number _____

Fees _____ date fees paid _____ received by _____

Official submission receipt data _____

Received by _____
Lehman Township

Stormwater Plan
Proposed Schedule of Fees

Subdivision name _____ Submittal No. _____

Owner _____ Date _____

Engineer _____

1. Filing fee $ _____

2. Land use
   - 2a. Subdivision, campgrounds, mobile home parks, and multi-family dwelling where the units are located in the same local watershed. $ _____
   - 2b. Multi-family dwelling where the designated open space is located in a different local watershed from the proposed units. $ _____
   - 2c. Commercial/industrial. $ _____

3. Relative amount of earth disturbance
   - 3a. Residential
     - road < 500 l.f. $ _____
     - road 500 - 2,640 l.f. $ _____
     - road > 2,640 l.f. $ _____
   - 3b. Commercial/industrial and other
     - impervious area < 3,500 s.f. $ _____
     - impervious area 3,500 - 43,460 s.f. $ _____
     - impervious area > 43,560 s.f. $ _____

4. Relative size of project
   - 4a. Total tract area < 1 ac $ _____
     - 1 - 5 ac $ _____
     - 5 - 25 ac $ _____
     - 25 - 100 ac $ _____
     - 100 - 200 ac $ _____
     - > 200 ac $ _____

5. Stormwater control measures
   - 5a. Detention basins and other controls which require a review of hydraulics routings ($ per control) $ _____
   - 5b. Other control facilities which require storage volume calculations but no hydraulic routings ($ per control) $ _____

6. Site inspection ($ per inspection) $ _____

Total $ _____

All subsequent reviews shall be 1/4 the amount of the initial review fee unless a new application is required as per Section 406 of the stormwater ordinance. A new fee shall be submitted with each revision in accordance with this schedule.

APPENDIX D
STANDARD STORMWATER FACILITIES MAINTENANCE AND MONITORING AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____ , 20____, by and between _____ , (hereinafter the "Landowner"), and Lehman Township, Pike County, Pennsylvania, (hereinafter "Township").

WITNESSETH

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

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

WHEREAS, the Subdivision/Land Management Plan (hereinafter "Plan") for the _____ Subdivision which is expressly made a part hereof, as approved or to be approved by the Township, provides for detention or retention of stormwater within the confines of the Property; and

WHEREAS, the Township and the Landowner, his successors and assigns agree that the health, safety, and welfare of the residents of the Township require that on-site stormwater management facilities be constructed and maintained on the Property; and

WHEREAS, the Township requires, through the implementation of the Lehman Township Stormwater Management Ordinance, that stormwater management facilities as shown on the Plan be constructed and adequately maintained by the Landowner, his 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 on-site stormwater management facilities shall be constructed by the Landowner, his successors and assigns, in accordance with the terms, conditions and specifications identified in the Plan.

2. The Landowner, his successors and assigns, shall maintain the stormwater management facilities in good working condition, acceptable to the Township so that they are performing their design functions.

3. The Landowner, his successors and assigns, hereby grants permission to the Township, his authorized agents and employees, upon presentation of proper identification, to enter upon the Property at reasonable times, and to inspect the stormwater management facilities whenever the Township deems necessary. The purpose of the inspection is to assure sage and proper functioning of the facilities. The inspection shall cover the entire facilities, berms, outlet structures, pond areas, access roads, etc. When inspections are conducted, the Township shall give the Landowner, his successors and assigns, copies of the inspection report with findings and evaluations. At a minimum, maintenance inspections shall be performed in accordance with the following schedule:

- Annually for the first 5 years after the construction of the stormwater facilities,
- Once every 2 years thereafter, or
- During or immediately upon the cessation of a 100 year or greater precipitation event.

4. All reasonable costs for said inspections shall be born by the Landowner and payable to the Township.

5. The owner shall convey to the Township easement and/or right-of-way to assure access for periodic inspections by the Township and maintenance, if required.

6. In the event the Landowner, his successors or assigns, fails to maintain the stormwater management facilities in good working condition acceptable to the Township, the Township may enter upon the Property and take such necessary and prudent action to maintain said stormwater management facilities and to charge the costs of the maintenance and/or repairs to the Landowner, his successors and assigns. The provisions shall not be construed as to allow the Township to erect any structure of a permanent nature on the land of the Landowner, outside of any easement belonging to the Township. 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.

7. The Landowner, his successors and assigns, will perform maintenance in accordance with the maintenance schedule for the stormwater management facilities including sediment removal as outlined on the approved schedule and/or Subdivision/Land Development Plan.

8. In the event that 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 30 days of receipt of invoice thereof, for all costs incurred by the Township hereunder. If not paid with said 30 day period, the Township may enter a lien against the property in the amount of such costs, or may proceed to recover costs through proceedings in equity or at law as authorized under the provisions of the _____ Code.

9. The Landowner, his successors and assigns, shall indemnify the Township and his 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 or assigns.

10. In the event a claim is asserted against the Township, his agents or employees, the Township shall promptly notify the Landowner, his successors or assigns, and they shall defend, at their own expense, any suit based on such claim. If any judgement or claims against the Township, his agents or employees shall be allowed, the Landowner, his successors and assigns shall pay all costs and expenses in connection therewith.

11. 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 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 citizens is at jeopardy. However, the Township shall notify the Landowner of any inspection, maintenance, or repair undertaken within 5 days of the activity. The Landowner shall reimburse the Township for his costs.

This Agreement shall be recorded among the land records of Pike 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 interest, in perpetuity,

ATTEST:

WITNESS the following signatures and seals:

(SEAL) For the Township

_____

(SEAL) For the Landowner

_____

ATTEST:

Lehman Township
County of Pike, Pennsylvania

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

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

_____
Notary Public

(SEAL)

Effective Date

This Ordinance shall take effect five (5) days following its adoption by the Board of Supervisors.

ORDAINED AND ENACTED into an Ordinance at a regular meeting of the Board of Supervisors of the Township of Lehman, Pike County, Pennsylvania, this 6th day of October 2005.

Township of Lehman

_____
John P. Sivick, Chairman

ATTEST: _____
Robert H. Rohner, Jr.
Township Secretary

(TOWNSHIP SEAL)

_____
Richard C. Vollmer

_____
Paul D. Menditto

APPENDIX A
APPLICATION FOR REVIEW OF A STORMWATER MANAGEMENT PLAN

APPLICATION IS HEREBY MADE FOR A REVIEW OF THE ATTACHED STORMWATER MANAGEMENT PLAN AND RELATED DATA IN ACCORDANCE WITH THE LEHMAN TOWNSHIP STORMWATER MANAGEMENT ORDINANCE.

****

1. NAME OF STORMWATER MANAGEMENT PLAN _____

2. NAME OF APPLICANT _____ PHONE NO. _____

ADDRESS _____

3. APPLICANT'S INTEREST IN SUBD./DEVEL: OWNER _____ AGREEMENT OF SALE _____ DEVELOPER _____

4. NAME OF PROPERTY OWNER _____ PHONE NO. _____

ADDRESS _____

5. NAME OF ENGINEER/SURVEYOR _____ PHONE NO. _____

ADDRESS _____

6. SITE DATA: COUNTY TAX NO. _____ DEED OF RECORD: DB _____ P _____ ZONING DISTRICT _____

7. TYPE OF SUBDIVISION/DEVELOPMENT PLANS:

____ MAJOR PRELIMINARY	____ CLUSTER HOUSING	____ COMMERCIAL
____ MAJOR FINAL	____ TOWNHOUSE	____ INDUSTRIAL
____ MINOR PLAN	____ APARTMENT HOUSE	____ MOBILE HOME PARK
	____ TIMESHARE	____ CAMPGROUND

8. PROPOSED DEVELOPMENT: NO. OF LOTS _____ TOTAL ACREAGE _____ LENGTH NEW ROAD _____

9. NAME OF RECEIVING WATER: _____ STREAM CLASSIFICATION _____

10. TOTAL EARTH DISTURBANCE _____

11. IMPERVIOUS AREA _____ SF EXISTING _____ SF PROPOSED

12. LOT COVERAGE _____% EXISTING _____% PROPOSED

13. ADDITIONAL COMMENTS ABOUT THE SUBDIVISION/DEVELOPMENT

_____

_____

_____

CERTIFICATE OF OWNERSHIP AND ACKNOWLEDGMENT OF APPLICATION:

As owner of the property described herein, I do hereby acknowledge said application and agree with the submittal of the same and all accompanying plans and data.

Date _____ Property Owner _____

****

(All information below this line to be completed by the Township)

OFFICIAL PLAN SUBMISSION RECEIPT DATE _____

FEES _____ DATE FEES RECEIVED _____

_____
CHAIRMAN, PLANNING COMMISSION

APPENDIX B
STORMWATER MANAGEMENT SUBMISSION REPORT

NAME OF SUBDIVISION/DEVELOPMENT _____

****

SUBMITTAL MATERIAL REQUIRED:
6 Copies of All Required Plans/Designs
3 Copies of All Supporting Calculations
6 Copies of All Planning Modules
4 Copies of All Other Documents

Design Storm _____

Does the proposed Stormwater Management criteria meet the Ordinance? _____

Are any variances requested? If so, attach separately. _____

Which hydrologic method was used in the calculations? _____

Have hydrologic routings been submitted for each design storm? _____

Has an E&S Plan been submitted to the PCCD? _____

Are wetlands present on the site? _____

Have the wetlands been delineated by a qualified individual? _____

Have the boundaries been verified by a state or federal agency? _____

Have the boundaries been surveyed by a Professional Land Surveyor? _____

What is the total area of any wetlands on the site? _____

What is the total area of any wetlands to be disturbed? _____

Has a Stormwater Management Plan and Narrative been submitted? _____

Has a construction sequence been prepared and submitted? _____

Has a schedule of inspections to be performed by the Applicant's Engineer been submitted? _____

What is the name of the individual to make the inspections? _____

Is a maintenance program attached? _____

What runoff control are proposed? _____

_____

Were the rainfall amounts provided by the Ordinance used in the calculations? _____

Was TR 55 used to calculate times of concentration? _____

Were runoff coefficients provided by the Ordinance used in the calculations? _____