

ORDINANCE NO. 229

 COPY

**AN ORDINANCE OF CAERNARVON TOWNSHIP,
BERKS COUNTY, PENNSYLVANIA
ADOPTING THE ACT 167 STORM WATER MANAGEMENT
PLAN FOR THE CONESTOGA RIVER WATERSHED**

TABLE OF CONTENTS

ARTICLE I - GENERAL PROVISIONS

- Section 101 - Statement of Findings
- Section 102 - Purpose
- Section 103 - Statutory Authority
- Section 104 - Applicability
- Section 105 - General Requirements
- Section 106 - Repealer
- Section 107 - Severability
- Section 108 - Compatibility with Other Ordinance Requirements

ARTICLE II - DEFINITIONS

ARTICLE III - DESIGN CRITERIA FOR STORM WATER MANAGEMENT FACILITIES

- Section 301 - General Requirements
- Section 302 - Storm Water Management Performance Standards
- Section 303 - Design Criteria for Storm Water Management Facilities
- Section 304 - Calculation Methodology
- Section 305 - Use of Performance Standards & Criteria

ARTICLE IV - STORM WATER MANAGEMENT SITE PLAN REQUIREMENTS

- Section 401 - Exemptions
- Section 402 - Storm Water Management Site Plan Contents
- Section 403 - Storm Water Management Site Plan Submission
- Section 404 - Storm Water Management Site Plan Review
- Section 405 - Modifications of Plans

ARTICLE V - INSPECTIONS

- Section 501 - Schedule of Inspections

ARTICLE VI - FEES AND EXPENSES

- Section 601 - General
- Section 602 - Expenses Covered by Fees
- Section 603 - Improvement Security

ARTICLE VII - MAINTENANCE RESPONSIBILITIES

- Section 701 - Applicability
- Section 702 - Maintenance Responsibilities
- Section 703 - Maintenance Agreement for Privately Owned Storm Water Management Facilities
- Section 704 - Maintenance of Facilities Accepted by the Municipality
- Section 705 - Maintenance of Existing Facilities / BMPs

ARTICLE VIII - ENFORCEMENT AND PENALTIES

- Section 801 - Right-of-Entry
- Section 802 - Notification
- Section 803 - Enforcement / Violations
- Section 804 - Public Nuisance
- Section 805 - Penalties
- Section 806 - Appeals
- Section 807 - Modification of Facilities
- Section 808 - Modification of Ordinance Provisions

APPENDICES

- A. Exemption Criteria
- B. Design Criteria
- C. Sample Storm Water Management Site Plan Application
- D. Subwatershed Boundary Map
- E. Suggested Storm Water Management Agreement and Declaration of Easement

ARTICLE I

GENERAL PROVISIONS

Section 101. Statement of Findings

The governing body of the Municipality finds that:

- A. Inadequate management of accelerated storm water runoff resulting from development throughout a watershed increases flood flows and velocities, contributes to erosion and sedimentation, overtaxes the carrying capacity of existing streams and storm sewers, greatly increases the cost of public facilities to convey and manage storm water, undermines floodplain management and flood reduction efforts in upstream and downstream communities, reduces groundwater recharge, and threatens public health and safety.
- B. A comprehensive program of storm water management, including reasonable regulation of development and activities causing accelerated erosion, is fundamental to the public health, safety, welfare, and the protection of the people of the Municipality and all the people of the Commonwealth, their resources, and the environment.

Section 102. Purpose

The purpose of this Ordinance is to promote health, safety, and welfare within the Conestoga River Watershed by minimizing the damages described in Section 101.A of this Ordinance through provisions designed to:

- A. Manage accelerated runoff and erosion and sedimentation problems at their source by regulating activities that cause these problems.
- B. Utilize and preserve the existing natural drainage systems.
- C. Encourage recharge of groundwater where appropriate and prevent degradation of groundwater quality.
- D. Maintain existing flows and quality of streams and watercourses in the Municipality and the Commonwealth.

- E. Preserve and restore the flood-carrying capacity of streams within the Conestoga River watershed.
- F. Provide proper maintenance of all permanent storm water management facilities that are constructed in the Municipality.
- G. Provide performance standards and design criteria for watershed-wide storm water management and planning.

Section 103. Statutory Authority

The Municipality is empowered to regulate land use activities that affect runoff by the authority of the Storm Water Management Act and the Second Class Township Code and the Floodplain Management Act and the Pennsylvania Municipalities Planning Code.

Section 104. Applicability/Regulated Activities

This Ordinance shall only apply to those areas of the municipality that are located within the Conestoga River Watershed as delineated in the Subwatershed Boundary Map of this Ordinance located in Appendix E which is hereby adopted as part of this Ordinance.

Any landowner or any person engaged in the alteration or development of land which may affect storm water runoff characteristics shall implement such measures consistent with the provisions of the Conestoga River Watershed Storm Water Plan. Examples of Regulated Activities include, but are not limited to the following::

- A. Land development;
- B. Subdivision;
- C. Construction of new or additional impervious or semi-pervious surfaces such as driveways and parking lots;
- D. Construction of new buildings or additions to existing buildings;
- E. Diversion or piping of any natural or manmade stream channel; and
- F. Installation of storm water management facilities or appurtenances thereto.

Section 105. General Requirements

For any of the activities regulated by this Ordinance, the final approval of subdivision and/or land development plans, the issuance of any building or occupancy permit, or the commencement of any land disturbance activity may not proceed until the Property Owner or

Developer or his/her agent has received written approval of a Storm Water Management Site Plan from the Municipality or its designee.

Section 106. Repealer

Any provisions of any ordinance of the Municipality inconsistent with any of the provisions of this Ordinance is hereby repealed to the extent of the inconsistency only.

Section 107. Severability

Should any section, provision or part thereof of this Ordinance be declared invalid by a court of competent jurisdiction, such decision shall not affect the validity of any of the remaining provisions of this Ordinance.

Section 108. Compatibility with Other Ordinance Requirements

Approvals issued pursuant to this Ordinance do not relieve the Applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act, or ordinance. Whenever there is a difference between the minimal applicable standards specified herein and those included in other applicable Municipal regulations:

- A. Within that portion of the Municipality located in the Conestoga River Watershed, the regulations of this Part shall apply.
- B. Within the remainder of the Municipality, the current standard shall apply.

ARTICLE II DEFINITIONS

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

- A. Words used in the present tense include the future tense; the singular number includes the plural, and the plural number includes the singular; words of masculine gender include those of feminine gender and vice-versa.
- B. The word "includes" or "including" shall not limit the term to the specific example but is intended to extend its meaning to all other instances of like kind and character.
- C. The word "person" includes an individual, firm, association, organization, partnership, trust, company, corporation, or any other similar entity and the members of such partnership or association and the officers of such corporation.

- D. The words "shall" and "must" are mandatory; the words "may" and "should" are permissive.
- E. The words "used or occupied" include the words "intended, designed, maintained, or arranged to be used or occupied."

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

Act 167 Plan - The Plan for managing storm water runoff in the Conestoga River Watershed adopted by Berks County as required by the Storm Water Management Act, and known as the Conestoga River Watershed Act 167 Storm Water Management Plan.

Agricultural Activities - The work of producing crops and raising livestock including tillage, plowing, discing, harrowing, pasturing and installation of conservation measures. Construction of new buildings or impervious areas is not considered an agricultural activity.

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

Applicant - A landowner or developer who has filed an application for approval to engage in any Regulated Activities as defined in Section 104 of this Ordinance.

BMP (Best Management Practice) - Any program technology, process, siting criteria, operating method, measure, or device that controls, prevents, removes, or reduces pollution.

Carbonate Geology - Limestone or dolomite bedrock.

Chapter 102 - Chapter 102 of the regulations of PaDEP, 25 Pa. Code Sect. 102.1 et seq.

Chapter 105 - Chapter 105 of the regulations of PaDEP, 25 Pa. Code Sect. 105.1 et seq.

Chapter 106 - Chapter 106 of the regulations of PaDEP, 25 Pa. Code Sect. 106.1 et seq.

Cistern - An underground reservoir or tank for storing rainwater.

Conservation District - The Berks County Conservation District.

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

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

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. The dam falls under the requirements of Chapter 105, Dam Safety and Waterway Management, if the following is true:

- A. The contributory drainage area exceeds 100 acres.
- B. The greatest depth of water measured by upstream toe of the dam at maximum storage elevation exceeds 15 feet.
- C. The impounding capacity at maximum storage elevation exceeds 50 acre-feet.

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

Designee - The agent of a municipal governing body involved with the administration, review or enforcement of any provisions of this ordinance by contract or memorandum of understanding.

Detention Basin - An impoundment structure designed to manage storm water runoff by temporarily storing the runoff and releasing it at a predetermined rate. In order not to fall under the requirements of Chapter 105, Dam Safety and Waterway Management, the following must be true:

- A. The contributory drainage area may not exceed 100 acres.
- B. The greatest depth of water measured by upstream toe of the dam at maximum storage elevation may not exceed 15 feet.
- C. The impounding capacity at maximum storage elevation may not exceed 50 acre-feet.

Developer - A person that undertakes any Regulated Activity of this Ordinance.

Development Site - The parent tract for which a Regulated Activity is proposed.

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

Downslope Property Line - That portion of a property line of a parent tract located at the topographically lowest point of the tract such that some or all overland, swale, or pipe flow from a Development Site would be directed toward it.

Drainage Conveyance Facility - A storm water management facility designed to transmit storm water runoff and shall include streams, channels, swales, pipes, conduits, storm sewers, etc.

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

Drainage Permit - A permit issued by the municipal governing body after the Storm Water Management Site Plan has been approved. Said permit is issued prior to or with the final municipal approval.

Earth Disturbance - Any activity including, but not limited to, construction, mining, timber harvesting and grubbing which alters, disturbs, and exposes the existing land surface.

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

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

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

Existing Conditions - The initial condition of a Development Site prior to the proposed construction.

FEMA - the Federal Emergency Management Agency.

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

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

Flood Plain Management Act - Act of October 4, 1978, P.L. 851, No. 166, as amended 32 P.S. Section 679.101 et seq., and as may be amended in the future.

Floodway - The channel of the watercourse and those portions of the adjoining floodplains which 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 stream to 50 feet from the top of the bank of 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 maximum design highwater elevation and the top of a dam, levee, tank, basin, or diversion ridge.

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

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

Groundwater Recharge - Replenishment of existing natural underground water supplies.

Impervious Surface - Impervious surfaces are those surfaces which do not absorb water. All structures, buildings, parking areas, driveways, roads, sidewalks and any areas of concrete, asphalt or packed stone shall be considered impervious surface. In addition, all other areas as determined by the Municipal 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 storm water runoff and infiltrate it into the ground (in the case of a retention basin) or release it at a controlled rate (in the case of a detention basin).

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

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

Land Development - Any of the following activities:

(1) The improvement of one lot or two or more contiguous lots, tracts or parcels of land for any purpose involving:

- a. a group of two or more residential or nonresidential buildings, whether proposed initially or cumulatively, or a single nonresidential building on a lot or lots regardless of the number of occupants or tenure; or
- b. the division or allocation of land or space, whether initially or cumulatively, between or among two or more existing or prospective

occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups or other features.

(2) A subdivision of land.

(3) Development in accordance with Section 503(1.1) of the MPC.

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.

Land Disturbance - Any activity involving grading, tilling, digging, or filling of ground or stripping of vegetation or any other activity that causes an alteration to the natural condition of the land.

Lineament - A fracture on the order of 10's of kilometers long usually extending to the basement below sedimentary rock.

Main Stem (Main Channel) - Any stream segment or other runoff conveyance facility used as a reach in the Conestoga River hydrologic model.

Manning Equation (Manning 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.

MPC - The Pennsylvania Municipalities Planning Code, Act of July 1, 1967, P.L. 805, No. 247, as reenacted and amended, 53 P.S. Section 10101 et seq., and as may be amended in the future.

Municipality - The Township of Caernarvon, Berks County, Pennsylvania.

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

NPDES - The U.S. EPA's "National Pollution Discharge Elimination System", which regulates point discharges (discrete conveyances such as pipes or man-made ditches).

NRCS - Natural Resources Conservation Service (previously SCS).

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

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

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.

Parking Lot Storage - Involves the use of impervious parking areas as temporary impoundments with controlled release rates during rainstorms.

PaDEP - The Pennsylvania Department of Environmental Protection, former entity the Pennsylvania Department of Environmental Resources, or any agency successor to the Pennsylvania Department of Environmental Protection

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

Parent Tract - All contiguous land held in single and separate ownership, regardless of whether (i) such land is divided into one or more lots, parcels, purparts 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 rights-of-way, which was held by the landowner or his predecessor in title on the effective date of this Ordinance.

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

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

Plan - The storm water management and erosion and sediment pollution control plans and narratives.

Planning Commission - The planning commission of Caernrvon Township, Berks County, Pennsylvania.

PMF - Probable Maximum Flood - The flood that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in any area. The PMF is derived from the probable maximum precipitation (PMP) as determined on the basis of data obtained from the National Oceanographic and Atmospheric Administration (NOAA).

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

Record Plan - Where a regulated activity constitutes a subdivision or land development, the Final Subdivision or Land Development plan which contains the information the Ordinance requires. Where a regulated activity does not constitute a subdivision or land development, a Storm Water

Management Site plan containing all required information and prepared in a form acceptable to the Office of the Recorder of Deeds for recording.

Regulated Activities - Any activity to which this ordinance is applicable pursuant to Section 104 of this Ordinance.

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

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 be expected to recur on the average once every twenty-five years.

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.

Rooftop Detention - Temporary ponding and gradual release of storm water 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.

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

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

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

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

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

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

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

Soil Group, Hydrologic - A classification of soils by the Soil Conservation Service into four runoff 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 more runoff.

Spillway - A depression in the embankment of a pond or basin which is used to pass a Post development 100 year storm peak flow rate.

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 and/or open channels that convey intercepted runoff and storm water from other sources, but excludes domestic sewage and industrial wastes.

Storm Water - The total amount of precipitation reaching the ground surface.

Storm Water Management Act - Act of October 4, 1978, P.L. 864, No. 167, as amended 32 P.S. Section 680.1 et seq., and as may be amended in the future.

Storm Water Management Facility - Any structure, natural or man-made, that, due to its condition, design, or construction, conveys, stores, or otherwise affects storm water runoff. Typical storm water management facilities include, but are not limited to, detention and retention basins, open channels, watercourses, road gutters, swales, storm sewers, pipes, and infiltration structures.

Storm Water Management Site Plan - The Plan prepared by the Developer or his representative indicating how storm water runoff will be managed at a particular development site according to this Ordinance. The contents of a Storm Water Management Site Plan are established in Section 402.

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

Subwatershed Area - The smallest drainage unit of a watershed for which storm water management criteria have been established in the Act 167 Plan.

Subdivision - The division or redivision of a lot, tract or parcel of land by any means into two or more lots, tracts, parcels or other divisions of land including changes in existing lot lines for the purpose, whether immediate or future, of lease, partition by the court for distribution to heirs or devisees, transfer of ownership or building or lot development: provided, however, that the

subdivision by lease of land for agricultural purposes into parcels of more than ten acres, not involving any new street or easement of access or any residential dwelling, shall be exempted.

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

Timber Operations - See Forest Management.

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

TR-20 (calibrated) - The computer-based hydrologic modeling technique adapted to the appropriate watershed for the Act 167 Plan. The model has been "calibrated" to reflect published and observed flow values by adjusting key model input parameters.

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

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

Waters of the Commonwealth - Any and all rivers, streams, creeks, rivulets, ditches, watercourses, storm sewers, lakes, dammed water, wetlands, ponds, springs, and all other bodies or channels of conveyance of surface and underground water, or parts thereof, whether natural or artificial, within or on the boundaries of this commonwealth.

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

ARTICLE III

DESIGN CRITERIA FOR STORM WATER MANAGEMENT FACILITIES

Section 301. General Requirements

- A. Storm water drainage systems shall be provided in order to permit unimpeded flow along natural watercourses, except as modified by storm water management facilities or open channel consistent with this Ordinance.
- B. The existing points of concentrated drainage that discharge onto adjacent property shall not be relocated and shall be subject to any applicable discharge criteria specified in this Ordinance.
- C. Where a Development Site is traversed by watercourses other than permanent streams, a drainage easement shall be provided conforming substantially to the line of such watercourses. The terms of the easement shall prohibit excavation,

the placing of fill or structures, and any alterations that may affect adversely the flow of storm water within any portion of the easement. Also, maintenance and mowing of vegetation within the easement shall be required.

- D. The PaDEP, 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 PaDEP's Regional Office. Permit requirements or inquiring on dam safety should be addressed to the PaDEP, Bureau of Waterways Engineering - Harrisburg.
- E. When it can be shown that, due to topographic conditions, natural drainage ways on the development site cannot adequately provide for drainage, open channels may be constructed conforming substantially to the line and grade of such natural drainageways. Work within natural drainageways shall be subject to approval by PaDEP through the Joint Permit Application process, or, where deemed appropriate by PaDEP, through the General Permit process.
- F. Carbonate Geology - In areas of carbonate geology, a registered Professional Geologist shall certify the following:
 - 1. No storm water facilities shall be placed in, over or immediately adjacent to the following features;
 - a. sinkholes
 - b. closed depressions
 - c. lineaments in carbonate areas
 - d. fracture traces
 - e. caverns
 - f. intermittent lakes
 - g. ephemeral streams
 - h. bedrock pinnacles (surface or subsurface)
 - 2. Storm water management basins shall not be located closer than one hundred (100) feet from the rim of sinkholes or closed depressions, nor within one hundred (100) feet from disappearing streams; nor shall these basins be located closer than fifty (50) feet from lineaments or fracture traces; nor shall these basins be located closer than twenty-five (25) feet from surface or identified subsurface pinnacles.
 - 3. Storm water resulting from regulated activities shall not be discharged into sinkholes.

4. If the developer can prove through analysis that the development site is in an area underlain by carbonate geology, and such geologic conditions may result in sinkhole formations, then the development site is exempt from recharge requirements as described in Sections 302.C and 304.F. However, the development site shall still be required to meet all other hydrologic and water quality management standards as found in this ordinance.
5. It shall be the developer's responsibility to verify if the development site is underlain by carbonate geology. The following note shall be attached to all Storm Water Management Site plans and signed and sealed by the developer's qualified professional, "I, _____, certify that the proposed detention basin (circle one) is/is not underlain by carbonate geology."
6. Whenever a storm water facility will be located in an area underlain by carbonate geology, a geological evaluation of the proposed location by a Registered Professional Geologist shall be conducted to determine susceptibility to sinkhole formation. The evaluation may include the use of impermeable liners to reduce or eliminate the separation distances listed in items 1 and 2 above.

Section 302. Storm Water Management Performance Standards

General

The following general standards shall be applied to all development within the Conestoga River Watershed to promote flow attenuation, erosion and sediment control and flood control.

1. The developer of any development site in the Conestoga River Watershed which does not fall under the exemption criteria in Appendix A shall submit a Storm Water Management Site plan consistent with the Conestoga River Watershed Act 167 Plan to the Municipality for review.

The exemption criteria in Appendix A shall apply to the total proposed development on a parent tract even if development is to take place in stages. Impervious cover shall include, but not be limited to, any roof, parking or driveway areas and any new streets and sidewalks. Any areas designed to initially be gravel or crushed stone shall be assumed to be impervious.

2. All storm water management site plans shall be designed and certified by individuals registered in the Commonwealth of Pennsylvania and qualified

to perform such duties based on education and training in hydrology and hydraulics.

3. Runoff from impervious areas shall be drained to pervious areas of the Development Site.
4. Roof drains shall not be connected to streets, sanitary or storm sewers or roadside ditches.
5. Storm water management facilities which involve a State Highway shall be subject to the approval of the Pa DOT.
6. Storm water management facilities located within or affecting the floodplain or any watercourse shall also be subject to the requirements of Section 306 (Floodplain) of this Ordinance, the Caernarvon Township Zoning Ordinance, the Caernarvon Township Subdivision and Land Development Ordinance, any Ordinance which regulates construction and development within areas of Caernarvon Township subject to flooding, and any other applicable requirements of the Floodplain Management Act.
7. Storm water runoff from a Development Site shall flow directly into a natural drainageway, watercourse, or into an existing storm sewer system, or onto adjacent properties in a manner similar to the runoff characteristics of the pre-development flow. Maximum use shall be made of the existing on-site natural and man-made storm water management facilities.
8. Storm water runoff shall not be transferred from one watershed to another unless they are sub-watersheds of a common watershed which join together within the perimeter of the Development Site, or the effect of the transfer does not alter the peak discharge (in conformance with the requirements of the Act 167 Plan) onto adjacent lands, or drainage easements from the affected landowners are provided.
9. All storm water runoff flowing over the Development Site shall be considered in the design of the storm water management facilities.
10. In accordance with Chapter 102, temporary facilities shall be included in the submitted plans for a phased section where the following conditions are met:
 - a. A regulated activity constitutes a Subdivision or Land Development.
 - b. The Final Plan applications are submitted in sections.
 - c. Temporary facilities are required for construction of a section.

A. Match Pre-existing Hydrograph

Developers and/or landowners are encouraged to provide infiltration facilities or utilize other techniques which will allow the post-development hydrograph to match the pre-existing hydrograph, along all parts of the hydrograph, for the development site. To match the pre-existing hydrograph means that it is not to be exceeded at all points in time. This option is most feasible for small subdivisions in areas of non-carbonate geology. "Groundwater Recharge" and "Water Quality" volumes as given in Sections 302.C and D below can be used as part of this option.

B. Detention/Infiltration Standards (only if existing hydrographs cannot be matched)

1. Post-development rates of runoff from any regulated activity shall not exceed a given percentage of the peak rate of runoff prior to development for all design storms unless the pre-existing hydrograph is not exceeded at all points in time. The percentage of the pre-development peak rate which may be released is known as the "release rate". The areas of the watershed for which a certain release rate applies can be found in Appendix E, "Subwatershed Boundary Map".
2. Innovative methods for the control of storm water runoff are encouraged. Various combinations of methods should be tailored to suit the particular requirements of the type of development and the topographic features of the Development Site. The following is a partial listing of detention and control methods which can be utilized in storm water management systems where appropriate:
 - a. Detention basins
 - b. Retention basins (subject to prior municipal approval)
 - c. Rooftop detention
 - d. Parking lot storage
 - e. Seepage pits, seepage trenches or other infiltration structures
 - f. Concrete lattice block surfaces
 - g. Grassed channels and vegetated strips.
 - h. Cisterns and underground reservoirs
 - i. Routed flow over grass
 - j. Decreased impervious surface coverage
 - k. Bio-retention areas (rain gardens)
 - l. Other methods as may be found in the "Pennsylvania Handbook of Best Management Practices for Developing Areas", the "Pennsylvania Stormwater Best Management Practices Manual", or equivalent

3. The following principles shall be applied to the Erosion and Sediment Pollution Control Plan and construction schedule to minimize soil erosion and sedimentation:
 - a. Stripping of vegetation, grading, or other soil disturbance shall be done in a manner which will minimize soil erosion.
 - b. Whenever feasible, natural vegetation shall be retained and protected.
 - c. The extent of the disturbed area and the duration of its exposure shall be kept to a minimum, within practical limits.
 - d. Either temporary seeding, mulching, or other suitable stabilization measures shall be used to protect exposed critical areas during construction.
 - e. Drainage provisions shall accommodate the storm water runoff both during and after construction.
 - f. Soil erosion and sedimentation facilities shall be installed prior to any on-site grading.

C. Groundwater Recharge

Developed areas shall maintain groundwater recharge consistent with pre-development conditions, dependent on hydrologic soil groups and impervious cover unless the developer can prove the inability of the development site to achieve recharge based on existing development site conditions. This volume of runoff is termed the "Recharge Volume" and is calculated in accordance with Section 304.F. The Recharge Volume must be infiltrated within 48 hours after the end of the design storm. Development sites where the post developed impervious area is equal to or less than the pre developed impervious area shall not be required to provide Ground Water Recharge volume.

Design of the storm water management facilities shall provide for ground water recharge to compensate for the reduction in the percolation that occurs when the ground surface runoff characteristics have been altered. A detailed geologic evaluation of the Development Site shall be performed to determine the suitability of recharge facilities. The evaluation shall be performed by a qualified design professional and shall, at a minimum, address soil permeability, depth to bedrock, susceptibility to sinkhole formation, and subgrade stability. Where pervious pavement is permitted for parking lots, recreational facilities, non-dedicated streets, or other areas, pavement construction specifications shall be noted on the plan.

If the developer can prove through analysis that the development site is in an area underlain by carbonate geology, and such geologic conditions may result in sinkhole formations, then the development site is exempt from recharge requirements. However, the development site shall still be required to meet all other hydrologic and water quality management standards as found in this ordinance.

D. Water Quality

Developed areas will provide adequate storage and treatment facilities necessary to capture and treat a minimum of the runoff from the first 1.2" of rainfall. This volume of storage is the "Water Quality Volume" and is calculated in accordance with Section 304.G. The Recharge Volume may be a component of the Water Quality Volume. If the Recharge Volume is less than the Water Quality Volume, the remaining Water Quality Volume may be captured and treated by methods other than recharge/infiltration BMPs. The Water Quality volume must take a minimum of 24 hours to be discharged. Development sites where the post developed impervious area is equal to or less than the pre developed impervious area shall not be required to provide Water Quality volume unless required by NPDES Part II.

- E. Storm water Conveyance Corridor Protection (riparian Corridor Preservation and vegetation)- Runoff from developed areas of the development site, including but not limited to areas of impervious surface, shall be managed through a series of riparian corridor vegetation facilities whenever possible. This will be accomplished in a manner satisfactory to the Municipality, utilizing the "Pennsylvania Handbook of Best Management Practices for Developing Areas", 1998, Riparian Forested Buffer, and the priority goal of the riparian vegetation will be the reduction of thermal impacts on storm water runoff associated with impervious areas, with a secondary goal being the protection of capacity of existing storm water conveyance channels. These goals will be achieved through the use of design criteria in Section 303 of this Ordinance and shall be in addition to any other municipal ordinance provisions.

F. Sub-Regional (Combined Development Site) Storage

Runoff can be managed regionally by one or more developers, either on-site or off-site. The design and release rate shall be consistent with the Conestoga River Act 167 Plan. "Groundwater Recharge" and "Water Quality" volumes as described in Sections 302.C and 302.D will be a part of this option.

- G. The "No Harm" option does not apply to the water quality requirement described in item "D" above. The "No Harm" option does not apply to the groundwater recharge requirement described in item "C" above, unless it can be shown that the development site is underlain by carbonate geology and infiltration can not be safely accomplished.

For any proposed development, the developer has the option of using a less restrictive runoff control if the developer can prove that "no harm" would be caused by discharging at a higher runoff rate than that specified by the Plan. Proof of "no harm" would have to be shown from the development site through the remainder of the downstream drainage network until there is no additional flow increase. Proof of "no

harm" must be shown using the capacity criteria specified in Section 303.C if downstream capacity analysis is a part of the "no harm" justification.

Attempts to prove "no harm" based upon downstream peak flow versus capacity analysis shall be governed by the following provisions:

1. The peak flow values to be used for downstream areas for the design return period storms (2-, 5-, 10-, 25-, 50-, and 100-year) shall be the values from the calibrated TR-20 Model for the Conestoga River Watershed. These flow values would be supplied to the developer by the County upon request.
2. At peak flow, any available capacity in the downstream conveyance system (as documented by a developer) may be used only in proportion to the proposed development site acreage relative to the total upstream undeveloped acreage (i.e. if the development site is 10% of the upstream undeveloped acreage, the developer may use up to 10% of the documented downstream available capacity at peak flow).
3. Developer-proposed runoff controls which would generate increased peak flow rates at documented storm drainage problem areas would, by definition, be precluded from successful attempts to prove "no harm," except in conjunction with proposed capacity improvements for the problem areas consistent with Sections 303.C and 303.S. of this Ordinance.

Any "no harm" justifications shall be submitted by the developer as part of the Drainage Plan submission per Article IV.

Section 303. Design Criteria for Storm Water Management Facilities

- A. Any storm water management facility designed to store storm water runoff and requiring a berm or earth embankment (i.e. detention or retention basin) shall be designed to provide an emergency spillway to handle the 100-year post-development peak flow rate. The height of embankment must be set to provide a minimum 1.0 foot of freeboard above the maximum elevation computed when the entire 100 year peak flow passes through the spillway. However, criteria for design and construction of storm water management facilities are not the same criteria that are used in the permitting of dams under the PaDEP 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 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. The following minimums shall be required:

1. The maximum water depth shall not exceed six (6) feet, unless approved by a modification granted in conformance with Section 808 by the municipal officials upon recommendation of the municipal Engineer.
2. The minimum top width of all dams/embankments/berms shall be five (5) feet.
3. The interior side slopes shall not be greater than five (5) horizontal to one (1) vertical.
4. 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. An emergency spillway shall be provided for the basin and shall be capable of discharging the 100-year peak rate of runoff which enters the basin after development, in a manner which will not damage the integrity of the facility and will not create a downstream hazard. Where practical, the emergency spillway shall be constructed in undisturbed ground. An easement for inspection and repair shall be provided when the conveyance structure crosses property boundaries.
5. All basins not including Groundwater Recharge and/or Water Quality storage shall include an outlet structure to permit draining the basin to a completely dry position within twenty-four (24) hours following the end of the design rainfall. All basins that do include Groundwater Recharge and/or Water Quality storage shall include an outlet structure to permit draining the basin to the level of the Groundwater Recharge and/or Water Quality storage within twenty-four (24) hours following the end of the design rainfall.
6. A cutoff trench of relatively impervious material shall be provided within all basin embankments.
7. All structures passing through Detention Basin embankments (as defined in Section II above) shall have properly spaced concrete cutoff collars and all piping must be watertight. All structures passing through Dam embankments (as defined in Section II above) shall have seepage diaphragms and drains.
8. All discharge control devices with appurtenances (except discharge pipes) shall be made of reinforced concrete and stainless or hot dip galvanized steel. Bolts/fasteners are to be stainless or galvanized steel. Discharge pipes shall conform to the requirements of Section E below.
9. Low flow channels shall be provided from each water carrying facility to the outlet structure for all basins that do not include Groundwater Recharge and/or Water Quality storage. Low flow channels shall be one (1) percent minimum slope and shall be designed to enable ease of maintenance. All basins that do

include Groundwater Recharge and/or Water Quality storage shall not be required to have a low flow channel.

10. Minimum slope within a basin that does not include Groundwater Recharge and/or Water Quality storage shall be two (2) percent positive grade to the low flow channel.
 11. Design storms for the computation of retention basins (where approved) volumes shall be based upon a 24-hour storm with 100 year return period (a storm with a 1% chance of occurrence each year).
 12. The effect on downstream areas if the basin embankment fails shall be considered in the design of all basins. Where possible, the basin shall be designed to minimize the potential damage caused by such failure of the embankment.
 13. All structures (detention basins, cisterns, etc.), other than those used for Groundwater Recharge Volume and Water Quality Volume, must completely drain within 24 hours after the end of the design storm.
 14. Soils used for the construction of basins shall have low erodibility factors ("K" factors).
- B. Minimum floor elevations for all structures that would be affected by a basin, other temporary impoundments, or open conveyance systems where ponding may occur shall be two (2) feet above the 100-year water surface. If basement or underground facilities are proposed, detailed calculations addressing the effects of storm water ponding on the structure and water-proofing and/or flood-proofing design information shall be submitted for approval.
- C. All storm sewer pipes, culverts and bridges (excluding detention and retention basin outfall structures), gutters and swales conveying water originating only from within the boundaries of the Development Site shall be designed for a twenty-five (25) year storm event. All storm sewer pipes, culverts and bridges (excluding detention and retention basin outfall structures) conveying water originating from offsite shall be designed for a fifty (50) year storm event. Drainage easements shall be provided to contain and convey the 100-year frequency flood throughout the Development Site. Easements shall begin at the furthest upstream property line of the proposed Development Site in a watershed.
- D. A concentrated discharge of storm water to an adjacent property shall be within an existing natural drainageway or watercourse or otherwise an easement shall be required.
- E. Storm sewer pipes other than those used as roof drains, detention basin underdrains, and street subbase underdrains, shall have a minimum diameter of

fifteen (15) inches and be made of reinforced concrete pipe, corrugated galvanized metal pipe, smooth lined corrugated polyethylene pipe, or approved equivalent. Where installation conditions merit, structural calculations that address the actual design requirements will be required.

- F. Storm sewer pipes and culverts shall be installed on sufficient slopes to provide a minimum velocity of three (3) feet per second when flowing full.
- G. All storm sewer pipe and culverts shall be laid to a minimum depth of one (1) foot from finished subgrade to the crown of pipe in paved areas and one (1) foot from finished grade to the crown of pipe in grassed areas.
- H. Curves in pipes or box culverts without an inlet or manhole are prohibited. Tee joints, elbows and wyes are also prohibited.
- I. Manholes, inlets, headwalls and endwalls proposed for dedication or located along streets or subject to vehicular traffic, shall conform to the requirements of the Pa DOT, Bureau of Design, Standards for Roadway Construction in effect at the time the design is submitted, or as otherwise modified by the Municipality.
- J. Headwalls and endwalls shall be used where storm water runoff enters or leaves the storm sewer horizontally from a natural or manmade channel. PaDOT Type "DW" headwalls and endwalls shall be utilized.
- K. Storm water roof drains, sump pumps, and pipes, shall not directly discharge water into a street right-of-way or discharge into a sanitary sewer or storm sewer.
- L. All existing and natural watercourses, channels, drainage systems, wetlands and areas of surface water concentration shall be maintained in their existing condition unless an alteration is approved by the Municipality and any other necessary approving body.
- M. Flow velocities from any storm sewer may not result in erosion of the receiving channel.
- N. Energy dissipators shall be placed at the outlets of all storm sewer pipes, culverts, and bridges where flow velocities exceed maximum permitted channel velocities as specified below:
 - (1) Three (3) feet per second where only sparse vegetation can be established and maintained because of shade or soil condition.
 - (2) Four (4) feet per second where normal growing conditions exist and vegetation is to be established by seeding.

- (3) Five (5) feet per second where a dense, vigorous sod can be quickly established or where water can be temporarily diverted during establishment of vegetation. Netting and mulch or the equivalent methods for establishing vegetation shall be used.
- (4) Six (6) feet per second where there exists a well established sod of good quality.

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

- (1) Capacities and velocities shall be computed using the Manning equation. The design parameters shall be as follows:
 - (a) Vegetated swales shall meet the following two design considerations:
 - (i) the first shall consider swale stability based upon a low degree of retardance ($n=.03$);
 - (ii) the second shall consider swale capacity based upon a high degree of retardance ($n=.05$).
 - (b) All vegetated swales shall have a minimum slope of one (1) percent unless approved by the municipal engineer.
 - (c) The " n " factors to be used for paved or rip-rap swales or gutters shall be based upon accepted engineering design practices as approved by the Municipality.
- (2) All swales shall be designed to concentrate low flows to minimize siltation and meandering.

P. Manning " n " values used for design of pipes and culverts shall be in accordance with Appendix B7.

Q. All storm sewer crossings of streets shall be perpendicular to the street centerline.

R. Storm facilities not located within a public right-of-way shall be contained in and centered within an easement. Easements shall follow property boundaries where possible.

S. Storm Water Conveyance Improvements - If the Developer can prove under the "No Harm Option" (see Section 302.G) that it would be feasible to provide conveyance improvements (install or upgrade pipes, bridges, swales, etc.) to relieve existing deficiencies as defined by Section 303.C and any Local, State, or Federal regulations, the conveyance improvements could be provided by the

Developer in lieu of storm water management facilities on the Development Site. Any conveyance improvements would be designed based on the eventual development of all areas tributary to the improvements and the conveyance criteria specified in this Ordinance. The eventual development of all tributary areas that the Developer must consider shall either be based on the current zoning or be established by the Municipality, whichever results in a greater amount of impervious surface. It shall be assumed that all new development upstream of a proposed conveyance improvement would implement applicable storm water management techniques, consistent with this Ordinance.

- T. Adequate erosion protection shall be provided along all open channels, and at all points of discharge.
- U. All groundwater recharge facilities shall be designed to empty in 48 hours subsequent to any storm event. All water quality facilities shall be designed so that water is released slowly for a minimum of 24 hours subsequent to any storm event. All infiltration, detention or retention facilities the volume of which will be used for storm water management (pre vs. post) shall be designed to empty within 24 hours subsequent to any storm event. Volumes which will not be available within 24 hours subsequent to any storm event shall not be used for storm water management (pre vs. post).

Section 304. Calculation Methodology

Storm water runoff from all Development Sites shall be calculated using either the modified rational method, a soil-cover-complex methodology, or other method acceptable to the Municipality or its designee.

- A. Any storm water runoff calculations involving drainage areas generally greater than 200 acres and T_c greater than 60 minutes, including on- and off-site areas, shall use generally accepted calculation technique that is based on the NRCS soil cover complex method. Table VIII-1 summarizes acceptable computation methods. It is assumed that all methods will be selected by the design professional based on the individual limitations and suitability of each method for a particular development site.

TABLE III-1 ACCEPTABLE COMPUTATION METHODOLOGIES FOR STORM WATER 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 limitations described TR-55.
HEC-1 / HEC-HMS	US Army Corps of Engineers	Applicable where use of full hydrologic computer model is desirable or necessary.
Rational Method (or commercial computer package based on Rational Method)	Emil Kuichling (1889)	For development sites less than 2 acres, $T_c < 60$ min. or as approved the Municipal Designee.
Other Methods	Varies	Other methodologies approved by Municipal Designee.

- B. If the Soil-Cover-Complex Method is used, storm water runoff shall be based on the following 24-hour storm events published in "Urban Hydrology for Small Watersheds", by USDA NRCS Engineering Division, also known as TR55. The original source was the U. S. Department of Commerce, Weather Bureau Technical Paper No. 40 (TP-40), "Rainfall Frequency Atlas of the United States", May 1961.

Storm Event	Inches-of-Rainfall
2 years	3.1
5 years	4.1
10 years	5.0
25 years	5.5
50 years	6.2
100 years	7.0

If the NRCS method is used, Antecedent Moisture Condition 1 is to be used in areas of carbonate geology, and Antecedent Moisture Condition 2 is to be used in all other areas.

If the Rational Method is used, the Region 5, Pa DOT Storm Intensity - Duration - Frequency Chart (PDT-IDF), dated May 1986 shall be used to determine the rainfall intensity in inches per hour. See chart in Appendix B1.

Note: The Rational Method is not to be used for the design of Dams (as defined in Section II above).

- C. Runoff calculations shall include a hydrologic and hydraulic analysis indicating volume and velocities of flow and the grades, sizes, and capacities of water carrying structures, sediment basins, retention and detention structures and sufficient design information to construct such facilities. Runoff calculations shall also indicate both pre-development and post-development rates for peak discharge of storm water runoff from the Development Site.
- D. For the purpose of calculating pre-development peak discharges, all runoff coefficients, both on-site and off-site, shall be based on actual land use assuming summer or good land conditions. Runoff coefficients for off-site discharges used to design facilities shall be based on actual land use assuming winter or poor land conditions.
- E. Criteria and assumptions to be used in the determination of storm water runoff and design of management facilities are as follows:
 - (1) Runoff coefficients shall be based on the information contained in Appendix B2 and B3 if the actual land use is listed in those Appendices. If the actual land use is not listed in these Appendices, runoff coefficients shall be chosen

from other published documentation, and a copy of said documentation shall be submitted with the storm water management report.

(2) Times of concentration shall be based on the following design parameters:

(a) Sheet flow: The maximum length for each reach of sheet or overland flow before shallow concentrated or open channel flow develops is one hundred fifty (150) feet. Flow lengths greater than one hundred (100) feet shall be justified based on the actual conditions at each development site. Sheet flow may be determined using the nomograph in Appendix B4, or the Manning's kinematic solution shown in the Sheet Flow section of Worksheet No. 1 in Appendix B5.

(b) Shallow concentrated flow: Travel time for shallow concentrated flow shall be determined using Figure 3-1 from TR-55, Urban Hydrology for small watersheds, as shown in Appendix B6.

A sample worksheet for calculating times of concentration is provided in Appendix B5.

(c) Open Channel flows: At points where sheet and shallow concentrated flows concentrate in field depressions, swales, gutters, curbs, or pipe collection systems, the travel times and downstream end of the development site between these design points shall be based upon Manning's Equation and/or acceptable engineering design standards as determined by the municipal engineer.

F. Ground Water Recharge requirements: The Ground Water Recharge Volume (Re_v) is the volume of storm water runoff from a developed site which shall be required to maintain existing pre-development groundwater recharge at Development Sites. It may be part of the Water Quality volume, and is calculated on the basis of treatment and recharge by structural storm water management practices, as follows:

$$S(0.05+0.9I)A/12$$

Re_v = Recharge volume in acre-feet

A = Area of watershed in acres

$R_v = 0.05 + 0.9(I)$ where I = net increase in impervious area / Area of watershed (A)

S is the Soil Specific Recharge factor and varies according to soil type:

Hydrologic Soil Group	Soil Specific Recharge Factor (S)
A	0.32
B	0.22
C	0.10
D	0.05

Each specific recharge factor (S) is based on the USDA average annual recharge volume per soil type divided by the annual rainfall in Lancaster County (41 inches per year) and multiplied by 90% (to model a volume which captures 90% of the runoff). This keeps the recharge volume calculation consistent with the WQ methodology. The USDA average annual recharge volume per soil type is 18" for HSG "A", 12" for HSG "B", 6" for HSG "C", and 3" for HSG "D" (Rawls, Brakensiek & Saxton, 1982).

- (1) If more than one hydrologic soil group (HSG) is present at a development site, a composite recharge volume shall be computed based upon the proportion of total development site area within each HSG.
- (2) Infiltration BMPs intended to receive runoff from developed areas shall be selected based on suitability of soils and development site conditions and shall be constructed on soils that have the following characteristics:
 - (a) A minimum depth of 48 inches between the bottom of the facility and the seasonal high water table and/or bedrock (limiting zones)
 - (b) An infiltration and/or percolation rate sufficient to accept the additional storm water load and drain completely as determined by field tests conducted by the Owner's professional designer.
- (3) Infiltration BMPs receiving only roof runoff may be placed in soils having a minimum depth of 24 inches between the bottom of the facility and the limiting zone.
- (4) The recharge volume provided at the development site shall be directed to the most permeable HSG available.
- (5) Structural Storm water management facilities which provide treatment and recharge of the required Recharge Volume will be designed as part of a storm water management facility which incorporates groundwater recharge BMPs as a primary benefit of using that facility, in accordance with design specifications contained in "Pennsylvania Handbook of Best management Practices for Developing Areas", 1998, or the most recent version thereof.

- (6) The Groundwater Recharge volume shall be infiltrated within 48 hours after the end of the design storm.
- (7) Development sites where the post developed impervious area is equal to or less than the pre developed impervious area shall not be required to provide Ground Water Recharge volume.

G. Calculation of Water Quality Volume: The Water Quality Volume (WQ_v) is the storage capacity needed to treat storm water runoff equivalent to a minimum of the first 1.2" of runoff from the developed areas of the development site. The following calculation is used to determine the storage volume, WQ_v , in acre-feet of storage:

$$WQ_v = [(1.2) (R_v)(A)] / 12$$

WQ_v = Water Quality volume in acre-feet

A = Area of watershed in acres

$R_v = 0.05 + 0.9(I)$ where I = net increase in impervious area / Area of watershed (A)

WQ_v shall be designed as part of a storm water management facility which incorporates water quality BMPs as a primary benefit of using that facility, in accordance with design specifications contained in "Pennsylvania Handbook of Best Management Practices for Developing Areas", 1998. The Water Quality volume shall take a minimum of 24 hours to be discharged from the basin. Development sites where the post developed impervious area is equal to or less than the pre developed impervious area shall not be required to provide Water Quality volume, unless required by NPDES part II.

Section 305. Use of Performance Standards and Criteria

The methodology for determining required storm water controls for a regulated activity is shown in Figure III-1 in Section 304, and is outlined below.

A. Compute:

1. Pre-development hydrograph at the development site discharge point for the required design storm.
2. Post-development hydrograph at the development site discharge point incorporating Best Management Practices such as groundwater recharge volume and water quality volume, pervious areas, grass swales, infiltration trenches, etc.

Note: Hydrographs may be obtained from NRCS methods such as TR-55, TR20, or from use of the "modified" or "unit hydrograph" rational methods.

B. Compare:

Post-development hydrographs with pre-development hydrographs. If the peak rate of runoff does not exceed the pre-development runoff at all points in time, storm water management has been achieved. Detention will not be required. If not, proceed to Item C.

C. Design:

Detention/retention facilities, in conjunction with any non-detention techniques, such that post-development peak rates from the development site will not exceed permissible levels for required design storms.

ARTICLE IV

STORM WATER MANAGEMENT SITE PLAN REQUIREMENTS

Section 401. Exemptions

- A. Any Regulated Activity that meets the exemption criteria in Appendix A of this Ordinance is exempt from the Storm Water Management Site Plan preparation provisions of this Ordinance. This criteria shall apply to the total development even if development is to take place in phases. The date of any previously adopted storm water management ordinance or the date of municipal ordinance adoption, whichever is older, shall be the starting point from which to consider tracts in which future subdivision and respective impervious area computations shall be cumulatively considered. Exemption shall not relieve the applicant from providing adequate storm water management to meet the purpose of this Ordinance.
- B. Land disturbance associated with existing one and two family dwellings, subject to conditions described in Appendix A of this Ordinance.
- C. Agricultural Activities when operated in accordance with a conservation plan or erosion and sedimentation control plan found adequate by the Conservation District. The agricultural activities such as growing crops, rotating crops, tilling of soil and grazing animals and other such activities are specifically exempt from complying with the requirements of this Ordinance.
- D. Forest Management operations which are following the PaDEP 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 402. Storm Water Management Site Plan Contents

All activities regulated by Section 104 of this ordinance and governed by the Act 167 Plan shall prepare a Storm Water Management site Plan. The Storm Water Management Site Plan shall consist of all applicable calculations, maps and plans. A note on the maps shall refer to the associated computations and erosion and sedimentation control plan by title and date. The cover sheet of the computations and erosion and sedimentation control plan shall refer to the associated maps by title and date. All Storm Water Management Site Plan materials shall be submitted to the Municipality or its designee in a format that is clear, concise, legible, neat and well organized. 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. The applicant may appeal the Municipality's decision not to accept a particular application in accordance with Section 806 of this Ordinance.

The following items shall be included in the Storm Water Management Site Plan:

A. General

1. General description of project.
2. General description of permanent storm water management techniques, including construction specifications of the materials to be used for storm water management facilities.
3. Complete hydrologic, hydraulic, and structural computations for all storm water management facilities.
4. Plans shall be legible in every detail.

B. Drawings or map(s) of the project area shall be drawn at 1" = 50' or larger scale and shall be submitted on 24-inch x 36-inch sheets and shall be prepared in a form that meets the requirements for recording for the Office of the Recorder of Deeds of Berks County. These drawings shall be in conformance with the applicable Subdivision and Land Development regulations. The contents of the map(s) shall include, but not be limited to:

1. The location of the project relative to highways, municipalities or other identifiable landmarks.
2. Existing contours at intervals of one or two feet. In areas of steep slopes (greater than 20 percent), five-foot contour intervals may be used.

3. Existing streams, lakes, ponds, or other bodies of water within the project area.
4. Other physical features including flood hazard boundaries, wetlands, sinkholes, streams, existing drainage courses, areas of natural vegetation to be preserved, and the total extent of the upstream area draining through the development site.
5. The locations of all existing and proposed utilities, sanitary sewers, and water lines within 50 feet of property lines.
6. An overlay showing soil names and boundaries.
7. Proposed changes to the land surface and vegetative cover, including the type and amount of impervious area that would be added.
8. Proposed structures, roads, paved areas, and buildings.
9. Final proposed contours at intervals of one or two feet. In areas of steep slopes (greater than 20 percent), five-foot contour intervals may be used.
10. The name of the development, the name and address of the owner of the property, and the name of the individual or firm preparing the Plan.
11. The date of the plan submission.
12. A graphic and written scale of one inch equals no more than fifty feet.
13. A North arrow.
14. The total Development Site boundary and size with distances marked to the nearest foot and bearings to the nearest degree.
15. Existing and proposed land use(s).
16. A key map showing all existing man-made features two hundred (200) feet beyond the Development Site boundary that could be affected by the project.
17. Horizontal and vertical profiles of all open channels, including hydraulic capacity.
18. Overland drainage paths.

19. A minimum twenty (20) foot wide access easement around all storm water management facilities that would provide ingress from and egress to a public right-of-way.
20. For storm water management facilities that would be located off-site, a note on the Plan referencing a recorded Storm Water Maintenance Agreement which indicates the location and responsibility for maintenance of the offsite facilities. All off-site facilities shall meet the performance standards and design criteria specified in this Ordinance. See Section 703, "Maintenance Agreement for Privately Owned Storm Water Facilities", for maintenance of on-site facilities.
21. A statement, signed by the landowner, acknowledging the storm water management system to be a permanent fixture that can be altered or removed only after approval of a revised Plan by the Municipality or its designee.
22. The following signature block for the Municipality or its designee:

"I, [Municipality or its designee], on this date [date of signature], have reviewed and hereby certify that the Storm Water Management Site Plan meets all design standards and criteria of the Conestoga River Watershed Act 167 Storm Water Management Ordinance."
23. The location of all erosion and sedimentation control facilities.

C. Supplemental Information

1. A written description of the following information shall be submitted:
 - a. The overall storm water management concept for the project.
 - b. Storm water runoff computations as specified in this Ordinance.
 - c. Storm water management techniques and best management practices to be applied both during and after development.
 - d. Expected project time schedule.
2. A soil erosion and sedimentation control Plan, including all reviews and approvals, as required by PaDEP or the Berks County Conservation District.
3. In areas of carbonate geology, a geologic assessment of the effects of storm water runoff and infiltration on sinkholes as specified in this ordinance.

4. The effect of the project (in terms of runoff volumes and peak flows) on adjacent properties and on any existing municipal storm water collection system that may receive runoff from the Development Site.
5. A Declaration of Adequacy / Highway Occupancy Permit from the PaDOT District Office when utilization of a PaDOT storm water facility is proposed.

D. Storm Water Management Facilities

1. All storm water management facilities must be located on a map and described in detail.
2. Plans for groundwater recharge facilities must show the locations of existing and proposed septic tank infiltration areas and wells. A minimum fifty (50) foot separation from On Lot Disposal System (OLDS) infiltration areas is required. Infiltration rates shall be based upon perk and probe tests conducted at the site of the proposed facility.
3. All calculations, assumptions and criteria used in the design of the storm water management facilities must be shown. If multiple facilities are used in conjunction with each other, such as infiltration best management practices with vegetation based management practices, a summary narrative shall be included describing any sequencing and how the facilities are meant to function with each other to manage storm water runoff.

Section 403. Storm Water Management Site Plan Submission

For the purpose of complying with this Ordinance, the steps below shall be followed for Storm Water Management Site Plan submission. For any activities that require a PaDEP Joint Permit Application and regulated under Chapter 105 or Chapter 106 of PaDEP's Rules and Regulations, require a PaDOT Highway Occupancy Permit, or require any other permit under applicable state or federal regulations, the permit(s) shall be part of the Storm Water Management Site Plan.

- A. Any Developer proposing to engage in a Regulated Activity shall submit Four (4) copies of the Storm Water Management Site Plan to the Municipality or its designee.
- B. Distribution of the Storm Water Management Site Plan will be as follows:
 1. Two (2) copies to the Municipality accompanied by the requisite Municipal Review Fee, as specified in this Ordinance.
 2. One (1) copy to the Municipal Engineer.

3. One (1) copy to the Berks County Planning Commission.

Section 404. Storm Water Management Site Plan Review

- A. The Municipality or its designee shall review the Storm Water Management Site Plan for consistency with the adopted Act 167 Plan. The Municipality or its designee shall require receipt of a complete plan, as specified in this Ordinance.
- B. In the case of a Subdivision or Land Development, the Municipal Engineer shall review the Storm Water Management Site Plan for conformance with the Caernarvon Township Subdivision and Land Development Ordinance for all provisions not superseded by this Ordinance.
- C. For Regulated Activities requiring a PaDEP Joint Permit Application, the Municipality or its designee shall notify PaDEP whether the Storm Water Management Site Plan is consistent with the Act 167 Plan and forward a copy of the review letter to the Municipality and the Developer. PaDEP may consider the Municipality or its designee's review comments in determining whether to issue a permit.
- D. The Developer shall be responsible for completing an "As-Built Survey" of all storm water management facilities included in the approved Storm Water Management Site Plan. The As-Built Survey and an explanation of any discrepancies with the design plans shall be submitted to the Municipality or its designee for final approval. In no case shall the Municipality or its designee approve the As-Built Survey until the Municipality or its designee receives a copy of an approved Declaration of Adequacy / Highway Occupancy permit from the PaDOT District Office, and any applicable permits from PaDEP.
- E. The Municipality or its designee's approval of a Storm Water Management Site Plan shall be valid for a period not to exceed one (1) year unless a schedule is submitted and approved for a longer period of time as part of the approval process. This one-year time period shall commence on the date that the Municipality or its designee approves the Storm Water Management Site Plan. If storm water management facilities included in this approved Storm Water Management Site Plan have not been constructed, or if an As-Built Survey of these facilities has not been approved within this one-year time period, then the Municipality or its designee may consider the Storm Water Management Site Plan disapproved and may recommend that the Municipality revoke any and all permits. Storm Water Management Site Plans that are considered disapproved by the Municipality or its designee shall be resubmitted in accordance with Section 403 of this Ordinance.

Section 405. Modification of Plans

- A. Certain modifications to a Storm Water Management Site Plan after submission but before approval shall require a re-submission of the modified Storm Water Management Site Plan consistent with Section 403 of this Ordinance and be subject to review as specified in Section 404 of this Ordinance. The modifications which would require a re-submission includes, but is not limited to, the following:
1. A change in storm water management facilities or techniques.
 2. The relocation or re-design of storm water management facilities.
 3. Modifications that are necessary because soil or other conditions are not as stated on the Storm Water Management Site Plan (as determined by the Municipality or its designee or the Municipal Engineer),
- B. Any modification to a Storm Water Management Site Plan after approval shall be submitted to the Municipality or its designee, accompanied by the applicable Review Fee.

ARTICLE V

INSPECTIONS

Section 501. Schedule of Inspections

- A. The Municipality or its designee, in conformance with Section 801, shall inspect all phases of the installation of any temporary or permanent storm water management facilities.
- B. During any stage of the work, if the Municipality or its designee determines that any temporary or permanent storm water management facilities are not being installed in accordance with the approved Storm Water Management Site Plan, the Municipality shall revoke any existing permits until a revised Storm Water Management Site Plan is submitted and approved, as specified in this Ordinance.

ARTICLE VI

FEES AND EXPENSES

Section 601. General

The fees required by this Ordinance are the Municipal Review Fee. The Municipal Review Fee shall be established by the Municipality by separate resolution or by Ordinance to defray

review costs incurred directly or indirectly by the Municipality and the Municipal Engineer. All fees shall be paid by the Applicant.

Section 602. Expenses Covered by Fees

The fees required by this Ordinance shall at a minimum cover:

- A. The review of the Storm Water Management Site Plan by the Municipality or its designee.
- B. The development site inspection.
- C. The inspection of storm water management facilities and drainage improvements during construction.
- D. The final inspection upon completion of the storm water management facilities and drainage improvements presented in the Storm Water Management Site Plan.
- E. Any additional work required to enforce any permit provisions regulated by this Ordinance, correct violations, and assure proper completion of stipulated remedial actions.
- F. Defray administration and clerical costs.

Section 603. Improvement Security

An improvement security (bond or letter of credit) for storm water related improvements shall be supplied by the Developer in conjunction with the subdivision/land development approval, or in conjunction with the Storm Water Management Site Plan approval if no subdivision/land development plan is required.

The applicant shall provide an improvement security to the Municipality for the timely installation and proper construction of all storm water management facilities as required by the approved Storm Water Management Site Plan and this ordinance equal to 110% of the construction cost of the required controls.

ARTICLE VII

MAINTENANCE RESPONSIBILITIES

Section 701. Applicability

For the purposes of this Article, drainage courses, swales, storm water inlets, pipes, conduits, detention basins and other storm water management facilities, including Best Management Practices (BMPs), shall be included under the term "storm water management facilities".

Section 702. Maintenance Responsibilities

- A. The Storm Water Management Site Plan for the Development Site shall contain an operation and maintenance schedule prepared by the developer and approved by the Municipality providing for the necessary and proper operation and maintenance of the storm water management facility(ies). The maintenance schedule shall also be recorded with the Final Subdivision or Land Development Plan, if one is required.
- B. The Storm Water Management Site Plan for the Development Site shall establish responsibilities for the continuing operating and maintenance of all proposed storm water control facilities, including Best Management Practices (BMP's), consistent with the following principals:
1. If a development contains structures such as streets, sewers and other public improvements that will be dedicated to the Municipality, storm water control facilities may also be dedicated to and maintained by the Municipality. Even if the Municipality elects to accept dedication of streets, the Municipality is under no obligation to accept storm water management facilities located outside of the public right-of-way.
 2. If a Development Site is to be maintained in single ownership or if sewers and other public improvements are to be privately owned and maintained, then the ownership and maintenance of storm water control facilities shall be the responsibility of the owner, lessee, private management entity, or any other parties in interests.
- C. The governing body, upon recommendation of the municipal Engineer, shall make the final determination on the continuing maintenance responsibilities prior to final approval of the Subdivision / Land Development / Storm Water Management Site Plan. The acceptance of ownership and operating/maintenance responsibilities for any or all of the storm water management facilities is at the sole discretion of the Municipality.
- D. Maintenance of storm water management facilities shall include, but not be limited to, the following:
1. Liming and fertilizing vegetated channels and other areas according to the specifications in the "Erosion and Sedimentation Control Handbook of Berks County."
 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. Selection of seed mixtures shall be subject to approval by the Municipality.
4. Removal of silt from all permanent structures which trap silt or sediment in order to keep the material from building up in grass waterways, pipes, detention or retention basins, infiltration structures, or BMPs, and thus reducing their capacity to convey or store water.
5. Regular inspection of the areas in question to assure proper implementation of BMPS, maintenance and care.
6. All pipes, swales and detention facilities shall be kept free of any debris or other obstruction and in original design condition.

Section 703. Maintenance Agreement for Privately Owned Storm Water Management Facilities

- A. Prior to final approval of the development site's Storm Water Management Site Plan, the property owner shall sign and record a maintenance agreement covering all storm water control facilities that are to be privately owned. Said agreement, designated as Appendix F, is attached and made part hereto. The agreement shall stipulate that:
 1. The owner shall maintain all facilities in accordance with the approved maintenance schedule and shall keep all facilities in a safe and attractive manner.
 2. The owner shall convey to the Municipality easements and/or rights-of-way to assure access for periodic inspections by the Municipality and maintenance, if required.
 3. The owner shall keep in file with the Municipality the name, address and telephone number of the person or company responsible for maintenance activities; in the event of a change, new information will be submitted to the Municipality within ten (10) days of the change.
 4. If the owner fails to maintain the storm water control facilities following due notice by the Municipality to correct the problem(s), the Municipality may perform the necessary maintenance work or corrective work and the owner shall reimburse the Municipality for all reasonable costs. Failure to reimburse the Municipality may lead to a lien being placed against any or all properties which utilize the facility.

- B. Other items may be included in the agreement where determined necessary to guarantee the satisfactory maintenance of all facilities. The maintenance agreement shall be subject to the review and approval of the municipal solicitor and governing body.

Section 704. Maintenance of Facilities Accepted by the Municipality

- A. If storm water management facilities are accepted by the Municipality for dedication, the landowner/developer shall be required to pay a specified amount to the Municipal Storm water Maintenance Fund to defray costs of periodic inspections and maintenance expenses. The amount of the deposit shall be determined as follows:
 - 1. If the storm water facility is to be owned and maintained by the Municipality, the deposit shall cover the estimated costs for maintenance and inspections for ten (10) years. The municipal engineer will establish the estimated costs utilizing information submitted by the applicant.
 - 2. The amount of the deposit to the fund shall be converted to present worth of the annual series values. The municipal engineer shall determine the present worth equivalents, which shall be subject to the approval of the municipal governing body.
- B. If a storage facility is proposed that also serves as a recreation facility (e.g. ballfield, lake), the Municipality may reduce or waive the amount of the maintenance fund deposit based upon the value of the land for public recreation purpose.
- C. If at any time a dedicated storage facility is eliminated due to the installation of storm sewers or other storage facility such as a regional detention facility, the unused portion of the maintenance fund deposit will be applied to the cost of abandoning the facility and connecting to the storm sewer system or other facility. Any amount of the deposit remaining after the costs of abandonment are paid will be returned to the depositor.
- D. All dedicated facilities shall be inspected once every three (3) years and after all major storm events by the municipal engineer to ensure the continued functioning of the facility. Maintenance will be conducted, based on these inspections, as is necessary to provide for the continued functioning of the facility. Costs of inspections and repairs are recoverable from the Municipal Storm water Maintenance Fund.

Section 705. Maintenance of Existing Facilities / BMPs

- E. Storm water management facilities existing on the effective date of this Ordinance on individual lots which have not been accepted by the Municipality 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 702.E above. If the Municipality determines at any time that any permanent storm water management facility has been eliminated, altered, blocked through the erection of structures or the deposit of materials, or improperly maintained, the 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 Municipality 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 such bill is not paid by the property owner within 30 days, the Municipality may file a municipal claim against the property upon which the work was performed in accordance with the applicable laws.
- F. No person shall modify, remove, fill, landscape or alter stormwater management facilities which have been installed on a property unless a storm water management permit has been obtained 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.

ARTICLE VIII

ENFORCEMENT AND PENALTIES

Section 801. Right-of-Entry

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

Section 802. Notification

In the event that any person fails to comply with the requirements of this Ordinance, or fails to conform to the requirements of any permit issued hereunder, the Municipality shall provide written notification of the violation. Such notification shall set forth the nature of the

violation(s) and establish a reasonable 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 Municipality from pursuing any and all other remedies.

Section 803. Enforcement / Violations

The municipal governing body is hereby authorized and directed to enforce all of the provisions of this ordinance. All inspections regarding compliance with the Storm water Management Site Plan shall be the responsibility of the Municipal Engineer or other qualified persons designated by the Municipality.

- A. A set of design plans approved by the Municipality shall be on file at the development site throughout the duration of the construction activity. Periodic inspections may be made by the Municipality or designee during construction.
- B. It shall be unlawful for any person, firm, or corporation to undertake any activity under Section 104 on any property except as provided for in the approved storm water management site plan and pursuant to the requirements of this ordinance. It shall be unlawful to alter or remove any control structure required by the storm water management site plan pursuant to this ordinance or to allow the property to remain in a condition which does not conform to the approved storm water management site plan.
- C. At the completion of the project, and as prerequisite for the release of the performance guarantee, the owner or his representatives shall:
 - 1. 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.
 - 2. Provide a set of as built drawings.
- D. After receipt of the certification by the Municipality, a final inspection shall be conducted by the governing body or its designee to certify compliance with this ordinance.
- E. Prior to revocation or suspension of a permit, the governing body will schedule a hearing to discuss the non-compliance if there is no immediate danger to life, public health or property.
- F. Suspension and revocation of permits

Any permit issued under this ordinance may be suspended or revoked by the governing body for:

- a. Noncompliance with or failure to implement any provision of the permit.
- b. A violation of any provisions 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.

A suspended permit shall be reinstated by the governing body when:

- a. The municipal engineer or his designee has inspected and approved the corrections to the storm watermanagement and erosion and sediment pollution control measure(s), or the elimination of the hazard or nuisance, and/or;
- b. The governing body is satisfied that the violation of the ordinance, law, or rule and regulation has been corrected.
- c. A permit revoked by the governing body cannot be reinstated. The applicant may apply for a new permit under the procedures outlined in this ordinance.

An occupancy permit shall not be issued unless satisfactory inspection pursuant to Section 803.D has been secured. The occupancy permit shall be required for each lot owner and/or developer for all subdivisions and land development in the Municipality.

It shall be a violation of this Ordinance to commit any of the following acts:

1. To commence land disturbance activities for which an approved Storm Water Management Site Plan is required prior to approval of said plan.
2. To install, repair, modify or alter stormwater management facilities prior to obtaining an approved Storm Water Management Site Plan.
3. To misuse or fail to maintain any storm water management facility install upon a property.
4. To construct any improvements upon, grade, fill, or take any other action which will impair the proper functioning of any storm water management facility.
5. To place false information on or omit relevant information from a Storm Water Management Site Plan.
6. To fail to comply with any other provisions of this Ordinance.

Section 804. Public Nuisance

- A. Any violation of any provision of this Ordinance is deemed to be a public nuisance.
- B. Each day that a violation of any provision continues constitutes a separate violation.

Section 805. Penalties

A. Any person who or which has violated any provisions of this Ordinance, shall, upon a judicial determination thereof, be subject to civil judgment for each such violation of not more than One Thousand and no/100 (\$1,000.00) Dollars for each violation, recoverable with costs. Each day that a violation occurs shall constitute a separate offense. All fines shall be paid to the Township of Caernarvon

B. In addition, the Township of Caernarvon 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 806. Appeals

A. Any person aggrieved by any action of the Board of Supervisors of Caernarvon Township may appeal to the Board of Supervisors of Caernarvon Township within thirty days of that action.

B. Any person aggrieved by any decision of the Board of Supervisors of Caernarvon Township may appeal to the Court of Common Pleas of Berks County within thirty days of that decision.

Section 807. Modification of Facilities

A modification involves a change in storm water management methods, techniques, or facilities, or which involves the relocation or redesign of storm water management facilities, or which is necessary because soil or other conditions are not as stated on the approved plan, shall require a resubmission by the developer in accordance with the plan requirements as set forth in 403 of this Ordinance.

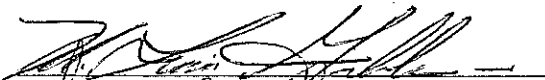
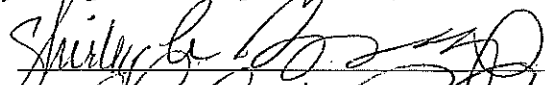
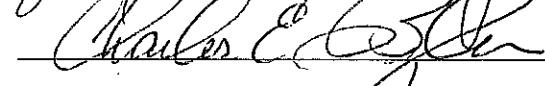



Section 808. Modification of Ordinance Provisions

A. The provisions of this Ordinance are intended as minimum standards for the protection of the public health, safety, and welfare. The Township/Borough reserves the right to modify or to extend them conditionally in individual cases as may be necessary in the public interest; provided, however, that such variation shall not have the effect of nullifying the intent and purpose of this Ordinance, and that the applicant shows that to the satisfaction of the Township/Borough that the applicable regulation is unreasonable, or will cause undue hardship, or that an alternative proposal will allow for equal or better results. The list of such modifications shall be listed on the plan.

B. In granting waivers/modifications, the Township may impose such conditions as will, in its judgement, secure substantially the objectives of the standards and requirements of this Ordinance.

ENACTED and ORDAINED at a regular meeting of the Board of Supervisors of the Township of Caernarvon on the 14th day of March, 2006.

CAERNARVON TOWNSHIP
BOARD OF SUPERVISORS

APPENDIX A

ACT 167 STORM WATER MANAGEMENT EXEMPTION CRITERIA

Existing Developed Properties:

Lands improved with existing structures may be exempted for an additional 1,000 square feet of impervious surface in all Zoning Districts provided that flows from the site after development leave the site in the same manner as the pre-development condition and there are no adverse effects to the adjacent property(ies).

Existing Properties in Effective Agricultural Zones and Conservation Zones:

The following criteria shall apply to all existing lots, whether vacant or with existing improvements, in conservation zones and effective agriculture** areas (1 lot per 20 acres or larger). This exemption applies to the parent tract of record and any lots subdivided from it. After the Cumulative New Impervious Areas Exempt from Ordinance has been used for a parent tract, there will be no additional exemptions. The criteria below apply to the parent tract.

Total Parcel Size	Minimum Distance* (Feet)	Cumulative New Impervious Areas Exempt from Ordinance
0-0.5 acre	10	500 sq. ft.
0.5-1 acre	50	2,500 sq. ft.
1-2 acres	100	10,000 sq. ft.
>2-5 acres	250	15,000 sq. ft.
>5 acres	500	20,000 sq. ft.

* The minimum distance between the proposed impervious area and/or storm water controls/structure discharge point to the downslope property line of the Parent Tract. In lieu of meeting the minimum distance criteria, the applicant may provide documentation from a Qualified Registered Professional in the state of Pennsylvania that the increased flows from the site leaves the site in the same manner as the pre-development condition and that there will be no adverse effects to adjacent property, or the increased flows reach a natural drainage way or existing storm water management structure before affecting adjacent property.

** All farms for which an exemption is requested shall have a Conservation Plan approved by the appropriate officials.

APPENDIX NO B-1

PA-DOT REGION 5 STORM IDF DATA BASE RAINFALL INTENSITY (Inches/Hour)

TIME (Min.)	STORM FREQUENCY (Years)					
	2	5	10	25	50	100
5.0	4.63	5.40	6.02	6.70	7.51	8.19
6.0	4.34	5.15	5.70	6.39	7.22	7.90
7.0	4.12	4.95	5.42	6.10	6.95	7.62
8.0	3.92	4.70	5.17	5.85	6.70	7.36
9.0	3.75	4.50	4.95	5.62	6.47	7.12
10.0	3.59	4.30	4.75	5.41	6.26	6.90
11.0	3.45	4.15	4.58	5.22	6.07	6.70
12.0	3.32	4.00	4.42	5.05	5.88	6.50
13.0	3.21	3.85	4.27	4.89	5.71	6.33
14.0	3.10	3.70	4.16	4.74	5.56	6.16
15.0	3.00	3.55	4.00	4.60	5.40	6.00
20.0	2.60	3.10	3.50	4.03	4.78	5.34
25.0	2.31	2.65	3.15	3.61	4.30	4.83
30.0	2.09	2.45	2.82	3.27	3.92	4.41
40.0	1.76	2.05	2.39	2.78	3.34	3.79
50.0	1.63	1.77	2.08	2.42	2.92	3.33
60.0	1.35	1.60	1.85	2.15	2.60	2.98

APPENDIX NO. B-2

RUNOFF COEFFICIENTS "C" FOR RATIONAL FORMULA

Runoff Coefficients "C" for Rational Formula												
Soil Group	A			B			C			D		
Slope	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
Land Use												
Cultivated Land winter conditions	.14	.23	.34	.21	.32	.41	.27	.37	.48	.34	.45	.56
summer conditions	.10	.16	.22	.14	.20	.28	.19	.26	.33	.23	.29	.38
Fallowed Fields poor conditions	.12	.19	.28	.17	.25	.34	.23	.33	.40	.27	.35	.45
good conditions	.08	.13	.16	.11	.15	.21	.14	.19	.26	.18	.23	.31
Forest/Woodland	.08	.11	.14	.10	.14	.18	.12	.16	.20	.15	.20	.25
Grass Areas good conditions	.10	.16	.20	.14	.19	.26	.18	.22	.30	.21	.25	.35
average conditions	.12	.18	.22	.16	.21	.28	.20	.25	.34	.24	.29	.41
poor conditions	.14	.21	.30	.18	.28	.37	.25	.35	.44	.30	.40	.50
Impervious Areas	.90	.91	.92	.91	.92	.93	.92	.93	.94	.93	.94	.95
Weighted Residential lot size 1/4 acre	.29	.33	.36	.31	.35	.40	.34	.38	.44	.36	.41	.48
lot size 1/2 acre	.26	.30	.34	.29	.33	.38	.32	.36	.42	.34	.38	.46
lot size 3/4 acre	.24	.28	.31	.26	.32	.35	.29	.35	.40	.32	.36	.45
lot size 1 acre	.21	.25	.28	.24	.27	.32	.27	.31	.37	.30	.34	.43
lot size 1 1/2 acre	.18	.23	.26	.21	.24	.30	.24	.29	.36	.28	.32	.41

APPENDIX NO. B-3

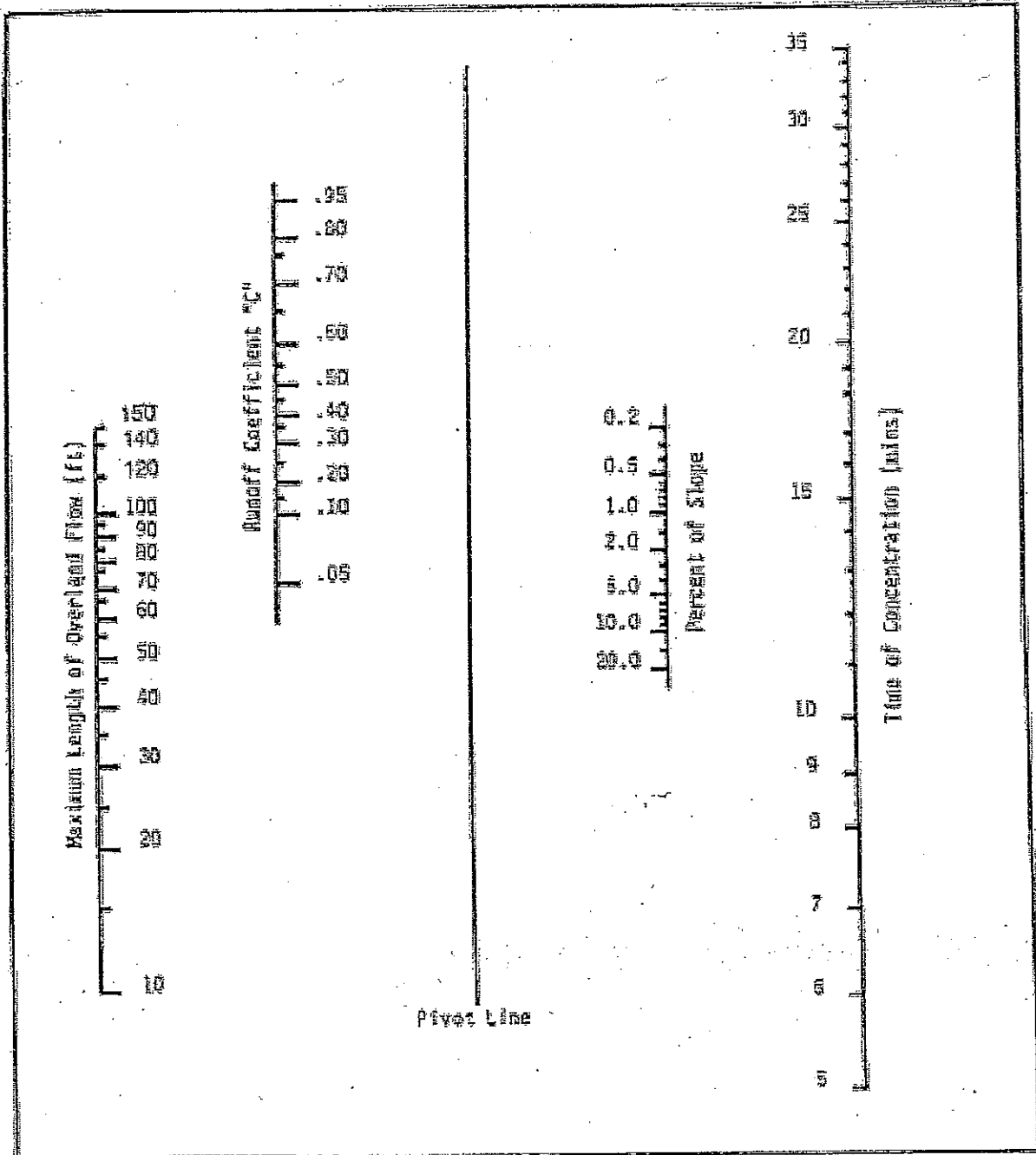
RUNOFF CURVE NUMBERS "CN" FOR SCS METHOD

Runoff Curve Numbers "CN" for SCS Method												
Soil Group	A			B			C			D		
Slope	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
Land Use												
Cultivated Land winter conditions summer conditions	48 35	60 51	65 61	62 48	73 55	73 70	68 57	78 65	79 77	77 64	81 69	88 80
Fallowed Fields poor conditions good conditions	45 30	54 44	76 74	56 43	63 48	85 83	64 48	74 54	90 88	69 56	77 60	93 90
Forest/Woodland	30	30	40	42	46	55	45	50	70	50	56	77
Grass Areas good conditions average conditions poor conditions	35 45 48	39 49 55	51 53 68	48 52 56	54 55 67	61 69 79	56 60 66	59 63 74	74 79 86	62 65 73	63 69 81	80 84 89
Impervious Areas	96	97	98	96	97	98	96	97	98	96	97	98
Weighted Residential lot size ¼ acre lot size ¼ acre lot size ¼ acre lot size ½ acre lot size 1 acre	71 61 57 54 51	75 62 59 57 55	77 67 65 63 62	74 66 64 62 61	76 69 66 64 63	85 75 72 70 68	78 67 65 63 61	80 69 66 65 64	90 83 81 80 79	81 75 74 72 71	83 78 77 76 75	92 87 86 85 84

APPENDIX NO. B-4

NOMOGRAPH FOR DETERMINING SHEET FLOW

(For use with the Rational Method)



APPENDIX NO. B-5

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

Project _____ By _____ Date _____

Location _____ Checked _____ Date _____

Circle one: Present Developed _____

Circle one: T_c T_t through subarea _____

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

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

Sheet flow (Applicable to T_c only) Segment ID

1. Surface description (table 3-1)
2. Manning's roughness coeff., n (table 3-1)
3. Flow length, L (total L ≤ **150 ft)..... ft
4. Two-yr 24-hr rainfall, P₂ in
5. Land slope, s ft/ft
6. $T_t = \frac{0.007 \text{ (in)}^{0.48}}{P_2^{0.48} s^{0.48}}$ Compute T_t hr

Shallow concentrated flow Segment ID

7. Surface description (paved or unpaved)
8. Flow length, L..... ft
9. Watercourse slope, s ft/ft
10. Average velocity, V (figure 3-1)..... ft/s
11. $T_t = \frac{L}{3600 V}$ Compute T_t hr

Channel flow Segment ID

12. Cross sectional flow area, a ft²
13. Wetted perimeter, P_w ft
14. Hydraulic radius, $r = \frac{a}{P_w}$ Compute r ft
15. Channel slope, s ft/ft
16. Manning's roughness coeff., n
17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V ft/s
18. Flow length, L..... ft
19. $T_t = \frac{L}{3600 V}$ Compute T_t hr

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)..... hr

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

APPENDIX NO. B-6

AVERAGE VELOCITIES FOR ESTIMATING TRAVEL TIME FOR SHALLOW CONCENTRATED FLOW

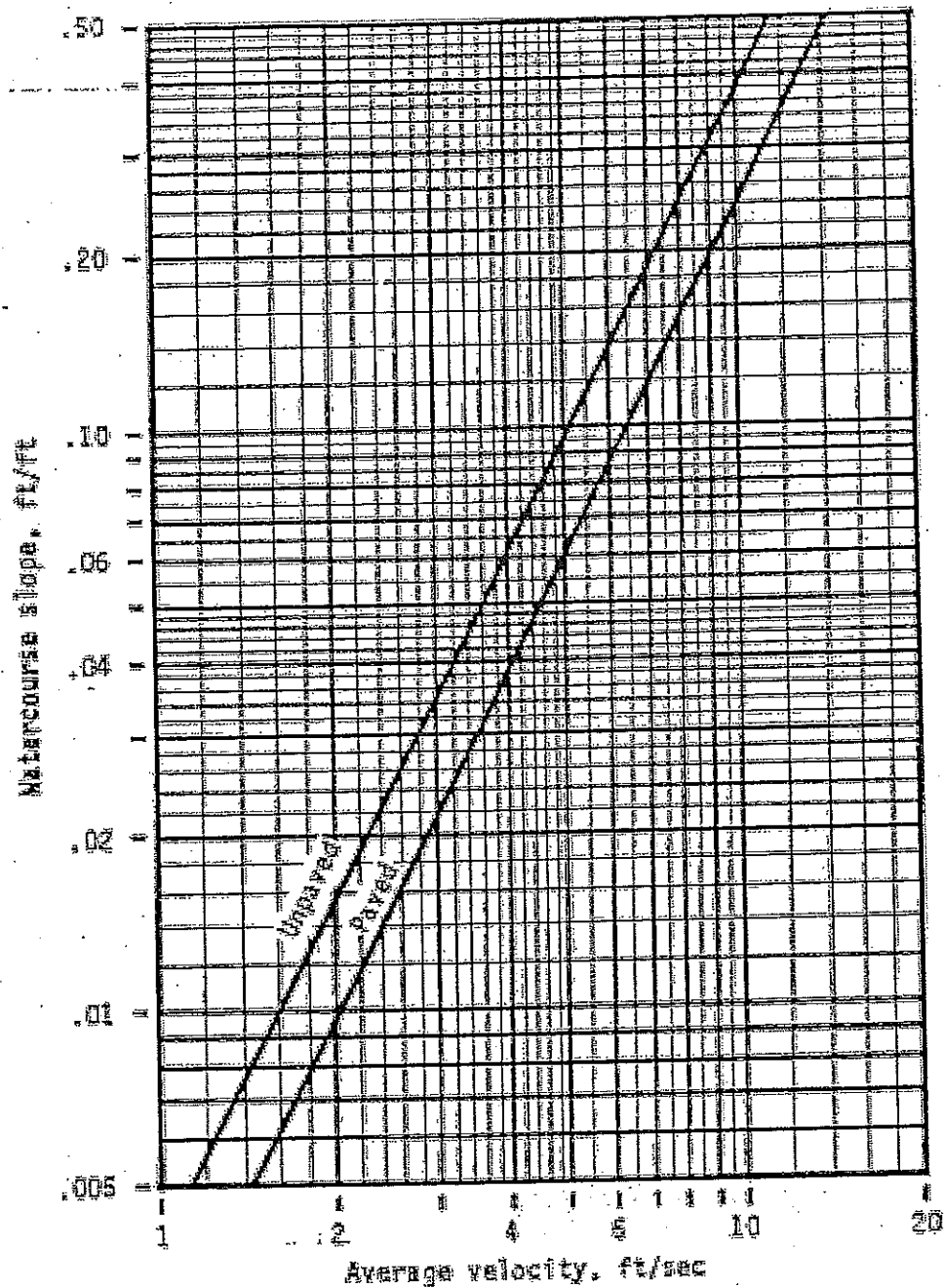


Figure 3-1.-Average velocities for estimating travel time for shallow concentrated flow.

APPENDIX NO. B-7

MANNING "n" VALUES FOR PIPES

Manning "n" Values for Pipes	
PIPE MATERIAL	MANNING "n"
Helical corrugated steel/aluminum 2 ² / ₃ x 1/3 corrugations diameter (inches)	
15	0.014
18	0.015
21	0.016
24	0.017
27	0.018
30	0.019
36	0.020
42	0.021
48	0.021
Reinforced Concrete All diameters	0.013
Corrugated Polyethylene Smooth lining All diameters	0.012

Note: Arch pipe shall have the Manning "n" of an equal periphery of circular pipe.

ORDINANCE APPENDIX C

SAMPLE STORM WATER MANAGEMENT SITE PLAN APPLICATION

SAMPLE STORM WATER MANAGEMENT SITE PLAN APPLICATION

(TO BE ATTACHED TO THE "LAND SUBDIVISION PLAN OR DEVELOPMENT PLAN REVIEW APPLICATION:
OR "MINOR LAND SUBDIVISION PLAN REVIEW APPLICATION")

APPLICATION IS HEREBY MADE FOR REVIEW OF THE STORM WATER MANAGEMENT AND EROSION
AND SEDIMENTATION CONTROL PLAN AND RELATED DATA AS SUBMITTED HERewith IN
ACCORDANCE WITH THE _____ TOWNSHIP STORM WATER MANAGEMENT AND
EARTH DISTURBANCE ORDINANCE.

_____ FINAL PLAN _____ PRELIMINARY PLAN _____ SKETCH PLAN

DATE OF SUBMISSION _____ SUBMISSION NO. _____

1. NAME OF SUBDIVISION OR DEVELOPMENT _____

2. NAME OF APPLICANT _____ TELEPHONE NO. _____

(IF CORPORATION, LIST THE CORPORATIONS NAME AND THE NAMES OF TWO OFFICERS OF
THE CORPORATION)

ADDRESS _____ ZIP _____

APPLICANT'S INTEREST IN SUBDIVISION OR DEVELOPMENT

(IF OTHER THAN PROPERTY OWNER GIVE OWNERS NAME AND ADDRESS

3. NAME OF PROPERTY OWNER _____ TELEPHONE NO. _____
ADDRESS _____ ZIP _____

4. NAME AND 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 LOTS	_____ MOBILE-HOME PARK	_____ INDUSTRIAL (MULTI-LOT)
_____ CLUSTER TYPE LOTS	_____ CAMPGROUND	_____ INDUSTRIAL (ONE-LOT)
_____ PLANNED RESIDENTIAL DEVELOPMENT	_____ OTHER (_____)	

6. LINEAL FEET OR NEW ROAD PROPOSES? _____ L.F.

7. AREA OF PROPOSED AND EXISTING IMPERVIOUS AREA ON ENTIRE TRACT.

A. EXISTING (TO REMAIN) _____ L.F.
B. PROPOSED _____ L.F.

8. STORM WATER

A. DOES THE PEAK RATE OF RUNOFF FROM PROPOSED CONDITIONS EXCEED THAT
FLOW WHICH OCCURRED FOR PREDEVELOPMENT CONDITIONS FOR THE DESIGNATED

DESIGN STORM? _____

- B. DESIGN STORM UTILIZED (ON-SITE CONVEYANCE SYSTEMS) (24 HR.)
(CHECK ONE)

____ NO. OF SUBAREA _____
____ WATERSHED NAME _____
____ OTHER _____

EXPLAIN: _____

- C. IS THE PROPOSED RUNOFF REDUCED TO THE ALLOWABLE RELEASE RATE FOR THE
SUBAREA IN WHICH THE SITE IS LOCATED FOR THE 2.33- AND 50- YEAR DESIGN
STORM? _____

- D. NUMBER OF SUBAREA FROM PLATE 1, VOLUME 1 TECHNICAL MANUAL OF THE MILL
CREEK WATERSHED STORM WATER MANAGEMENT PLAN. _____

- E. TYPE OF PROPOSED RUNOFF CONTROL _____

- F. DOES THE PROPOSED STORM WATER CONTROL CRITERIA MEET THE
REQUIREMENTS/GUIDELINES OF THE STORM WATER ORDINANCES? _____
- IF NOT, WHAT VARIANCES/WAIVERS ARE REQUESTED? _____

REASONS WHY _____

- G. DOES THE PLAN MEET THE REQUIREMENTS OF ARTICLE III OF THE STORM WATER
ORDINANCES? _____ - IF
NOT, WHAT VARIANCES/WAIVERS ARE REQUESTED _____ - REASONS
WHY _____

- H. WAS TR-55, JUNE 1986, UTILIZED IN DETERMINING THE TIME OF CONCENTRATION?

- I. IS A HYDRAULIC ROUTING THROUGH THE STORM WATER CONTROL STRUCTURE
SUBMITTED? _____

- J. IS A CONSTRUCTION SCHEDULE OR STAGING ATTACHED? _____

- K. IS A RECOMMENDED MAINTENANCE PROGRAM ATTACHED? _____

- L. WHO WILL HAVE ULTIMATE MAINTENANCE RESPONSIBILITY OF THE STORM WATER
CONTROL FACILITIES? _____

9. EROSION AND SEDIMENT POLLUTION CONTROL (E&S)

- A. HAS THE STORM WATER MANAGEMENT AND E&S PLAN, SUPPORTING
DOCUMENTATION AND NARRATIVE BEEN SUBMITTED TO THE LANCASTER 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 WHOM WILL BE MAKING THE INSPECTIONS _____

- D. GENERAL COMMENTS ABOUT STORM WATER MANAGEMENT AT DEVELOPMENT

CERTIFICATE OF OWNERSHIP AND ACKNOWLEDGMENT OF APPLICATION:

COMMONWEALTH OF PENNSYLVANIA

COUNTY OF LANCASTER SS

On this the _____ day of _____, 20____, before me, the undersigned officer, personally appeared _____

_____ who being duly sworn, according to law, desposes 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

Property Owner

My Commission Expires _____, 20____ Notary
Public or Officer

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

SIGNATURE OF APPLICANT _____

**

(INFORMATION BELOW THIS LINE TO BE COMPLETED BY THE TOWNSHIP)

_____ TOWNSHIP OFFICIAL SUBMISSION RECEIPT.

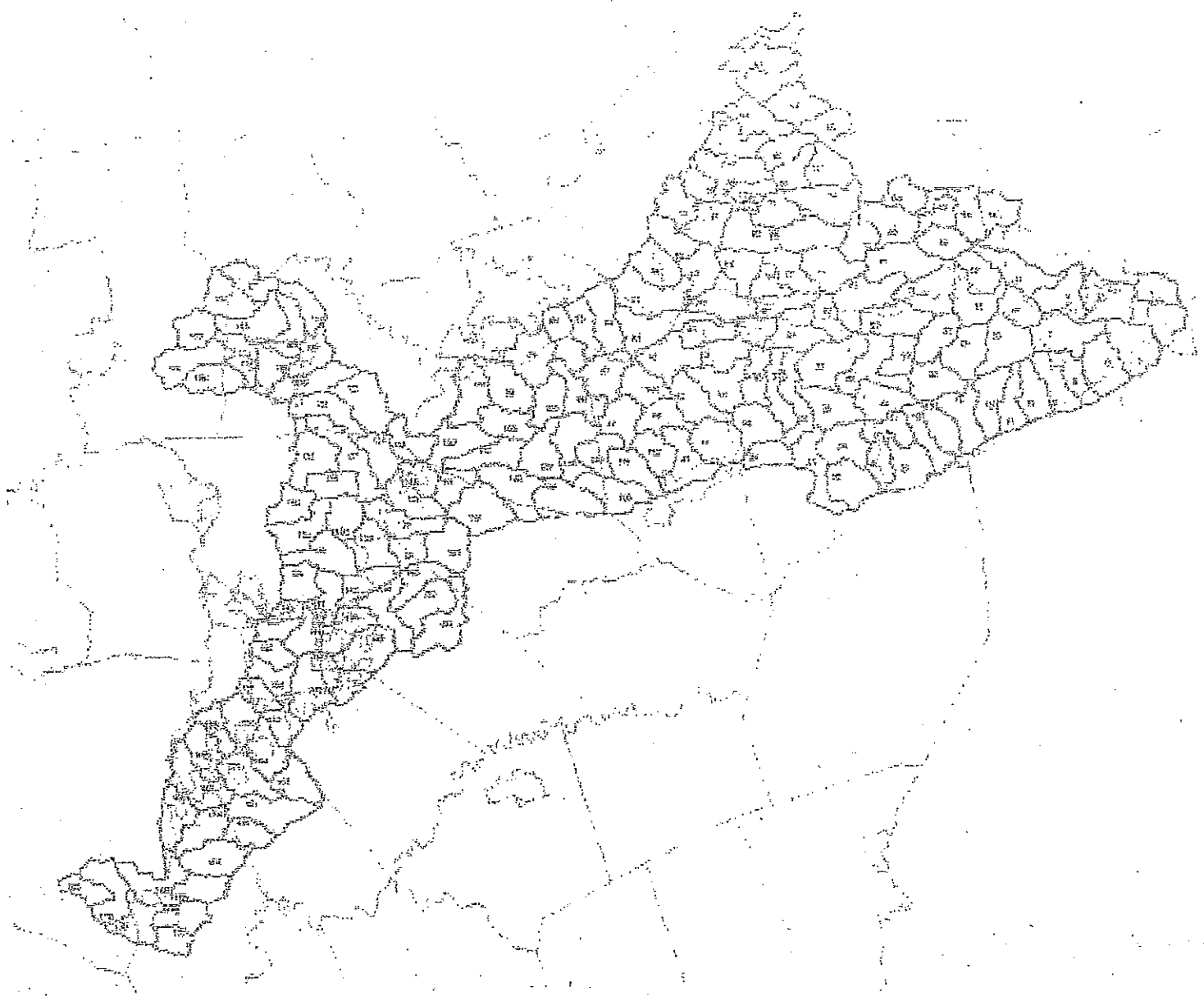
DATE COMPLETE APPLICATION RECEIVED _____ PLAN NUMBER _____

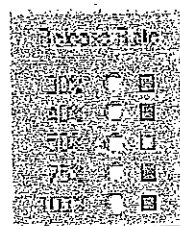
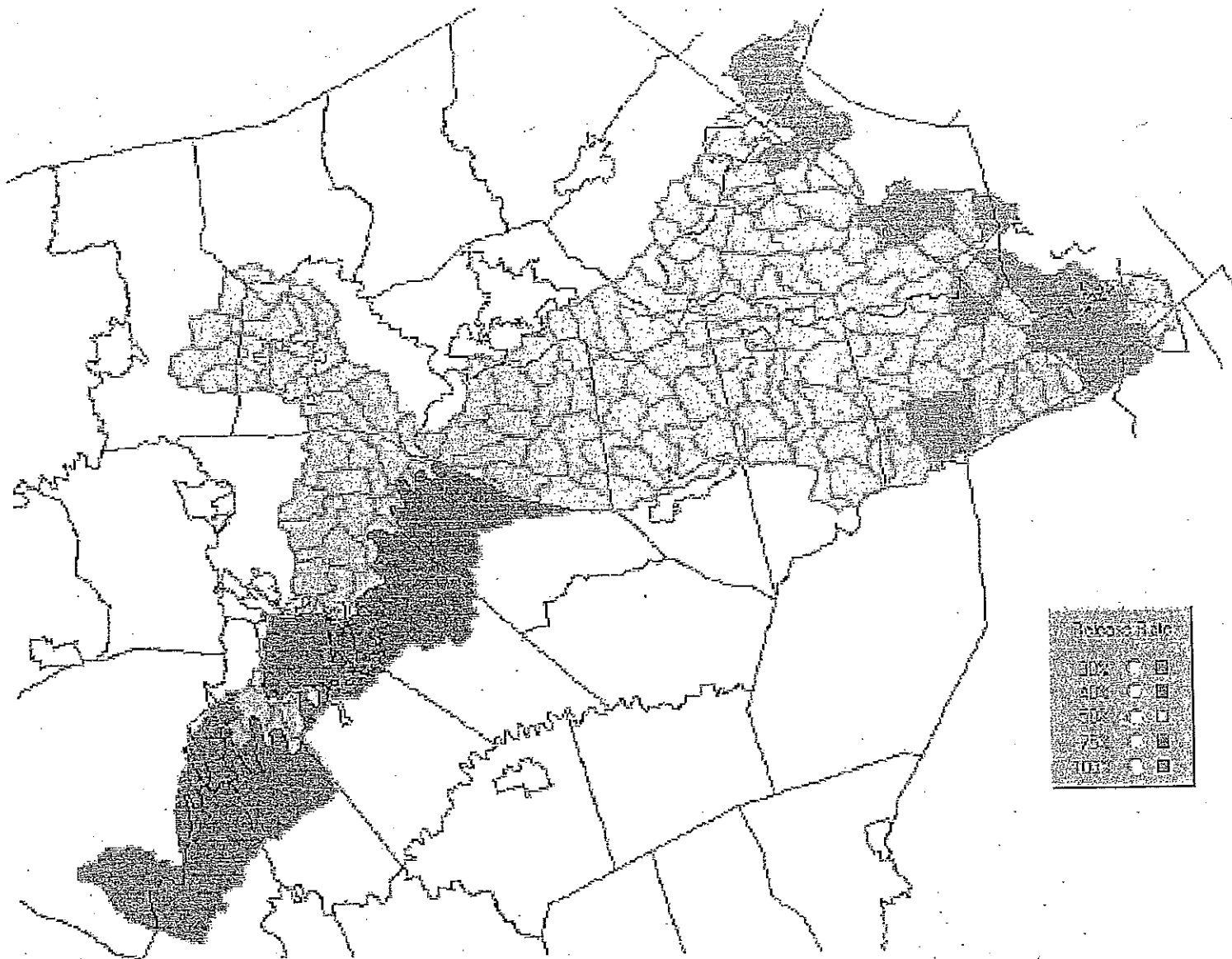
FEES _____ DATE FEES PAID _____ RECEIVED BY _____

OFFICIAL SUBMISSION RECEIPT DATE _____

RECEIVED BY _____

APPENDIX D
SUBWATERSHED BOUNDARY MAP





APPENDIX E

**SUGGESTED STORM WATER MANAGEMENT AGREEMENT
AND DECLARATION OF EASEMENT**

APPENDIX E

**SUGGESTED STORM WATER MANAGEMENT AGREEMENT
AND DECLARATION OF EASEMENT**

THIS AGREEMENT AND DECLARATION OF EASEMENT made as of this ____ day of _____, 2001, by and between the [Municipality], Lancaster/Berks/Chester County, Pennsylvania, a [Township/Borough] duly organized under the laws of the Commonwealth of Pennsylvania, with its municipal offices located at [location] Pennsylvania (hereinafter referred to as the [Municipality]) and _____, with offices located at _____ (hereinafter whether singular or plural referred to as the "Grantor").

BACKGROUND.

Grantor is the legal and/or beneficial owner of premises located at _____, in the [Municipality], Lancaster/Berks/Chester County, Pennsylvania, as more specifically described in a deed recorded in Record Book _____, Volume _____, Page _____, in the Office of the Recorder of Deeds in and for Lancaster/Berks/Chester County, Pennsylvania, and as shown on the plan for _____, prepared by _____, Drawing or Project No _____, dated _____, 200____, last revised _____, 200____, (hereinafter referred to as the "Premises").

Prior to the commencement of any development, Grantor is required under the [Municipality] Storm Water Management Ordinance (the "Ordinance"), as codified at Chapter 26, Part 2, of the [Municipality] Code of Ordinances, to submit a Storm Water Management Site Plan to the [Township/Borough] for approval. Sections 702 and 703 of the Ordinance require that the Grantor make provision for the ownership of, and the method of administering and maintaining, all permanent storm water management facilities. Drainage courses, swales, storm water inlets, pipes, conduits, detention basins and other storm water management facilities, including Best

Management Practices (BMPs) shall be included under the term "storm water management facilities".

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

NOW, THEREFORE, intending to be legally bound hereby and in consideration of receiving approval of its Storm Water Management Site Plan (hereinafter referred to as the "Plan") from the Board of Supervisors/Borough Council of [Municipality], and in consideration of receiving permits from the [Township/Borough] to develop the Premises, Grantor, for Grantor and the assigns and successors of Grantor, covenants and declares as follows:

1. The storm water facilities will be owned by Grantor, its successors and assigns.

2. All drainage courses, swales, storm water inlets, pipes, conduits, detention basins and other storm water management facilities, shall be installed, constructed and maintained by Grantor, its successors and assigns, in a first-class condition in conformance with the Plan, as approved by the Board of Supervisors/Borough Council of [Municipality], and in a manner sufficient to meet or exceed the design standards and specifications set forth on the Plan and the minimum design and maintenance standards and requirements set forth in Sections 303 and 304 of the Ordinance. These responsibilities shall include, but not be limited to, the following:

- (a) Liming and fertilizing vegetated channels and other areas according to the specifications in the "Erosion and Sedimentation Control Handbook of Lancaster/Berks/Chester County."

- (b) Reestablishment of vegetation by seeding and mulching or sodding of scoured

areas or areas where vegetation has not been successfully established.

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

(d) Removal of silt from all permanent structures which trap silt or sediment in order to keep the material from building up in grass waterways, pipes, detention or retention basins, infiltration structures, or BMPs, and thus reducing their capacity to convey or store water.

(e) Regular inspection of the areas in question to assure proper implementation of BMPs, maintenance and care.

(f) All pipes, swales and detention facilities shall be kept free of any debris or other obstruction.

Grantor, its successors and assigns, shall be responsible for performing the foregoing maintenance and for implementing BMPs and maintaining BMP facilities as required by the Ordinance.

3. Grantor, for itself, its successors and assigns, agrees that the failure to maintain all drainage courses, swales, storm water inlets, pipes, conduits, detention basins, BMPs, and other storm water management facilities in a first-class condition in conformance with this Agreement and the Plan shall constitute a nuisance and shall be abatable by the [Township/Borough] as such.

4. Grantor, for itself, its successors and assigns, authorizes the [Township/Borough], at any time and from time to time, by its authorized representatives, to enter upon the Premises

to inspect the storm water management facilities.

5. The [Township/Borough] may require that Grantor, its successors or assigns, or any future owner or occupier of the Premises, or any part thereof, take such corrective measures as the [Township/Borough] may deem reasonably necessary to bring the Premises into compliance with this Agreement and with the Plan, as approved by the Board of Supervisors/Borough Council of [Municipality].

6. Upon the failure of the owner or occupier of the Premises to comply with the terms of this Storm Water Management Agreement or to take corrective measures following thirty (30) days' notice from the [Township/Borough], the [Township/Borough], through its authorized representatives, may take such corrective measures as it deems reasonably necessary to bring the Premises into compliance with this Agreement and with the Plan, including, but not limited to, the removal of any blockage or obstruction from drainage pipes, swales and detention basins, and may charge the cost thereof to Grantor, its successors or assigns, or any owner of the Premises and, in default of such payment, may cause a municipal lien to be imposed upon the Premises or any part thereof.

7. If ownership or maintenance responsibility of the storm water management facilities is assigned to a homeowners' association, condominium unit owners' association, or similar entity, the [Township/Borough] shall be notified. In the event such an association or entity has already been formed, the association or entity shall consent to and join in this Agreement. If such association or entity fails to properly maintain the storm water management facilities, the [Township/Borough] shall have the same rights granted to municipalities with reference to maintenance of common open space under Section 705 of the Pennsylvania Municipalities Planning Code, Act of July 31, 1968, P.L. 805, No. 247, or any future amendment thereof, to

maintain the storm water management facilities. Any association or entity hereinafter formed shall enter into an agreement with the [Township/Borough] recognizing its duties and the [Township/Borough]'s rights under this Agreement.

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

9. Grantor shall include a specific reference to this Storm Water Management Agreement and Declaration of Easement and the requirement to implement BMPs and maintain BMP facilities in accordance with the minimum design standards and requirements for BMPs set forth in the Ordinance in any deed of conveyance for the Premises or any part thereof.

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

11. The [Township/Borough] may, in addition to the remedies prescribed herein, proceed with any action at law or in equity to bring about compliance with the [Municipality] Storm

Water Management Ordinance and this Agreement.

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

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

14. It is the intent of the parties to this Agreement that personal liability and maintenance obligations shall pass to subsequent title owners upon change in ownership of the Premises or any lot created from the Premises, and such subsequent owners shall assume all personal liability and maintenance obligations for the time period during which they hold title.

Personal liability shall remain for any violations of this Agreement and Declaration of Easement which occurred during the period in which an owner held title.

15. This Agreement and Declaration of Easement shall be binding upon Grantor, the successors and assigns of Grantor, and all present and future owners of the Premises, or any part thereof, and is intended to be recorded in order to give notice to future owners of the Premises, or any part thereof, of their duties and responsibilities with respect to the storm water management facilities.

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

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

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

[Municipality]

By: _____
(Vice) Chairman
Board of Supervisors/Borough Council

Attest: _____
(Assisfant) Secretary

[[Township/Borough] SEAL]

(Individual or Husband and Wife Developer)

Witness:

(Signature of Individual) _____ (SEAL)

(Signature of Spouse if Husband and
Wife are Co-Developers) _____ (SEAL)

(if individual or spouses operate a business
Trading and doing business as:

(Partnership Developer*)

(Name of Partnership)

Witness:

By: _____
Partner

By: _____
Partner

By: _____
Partner

*All Partners must execute this Agreement. Additional signature lines should be attached if
necessary.

(Corporation Developer)

(Name of Corporation)

ATTEST:

By: _____
(Assistant) Secretary

By: _____
(Vice) President

[CORPORATE SEAL]

([Township/Borough] ACKNOWLEDGMENT)

COMMONWEALTH OF PENNSYLVANIA)
) SS:)
COUNTY OF Lancaster/Berks/Chester)

On this __ day of _____, 200__, before me, the undersigned officer, a notary public in and for the aforesaid Commonwealth and County, personally appeared _____, who acknowledged himself/herself to be (Vice) Chairman of the Board of Supervisors/Borough Council of the [Municipality], Lancaster/Berks/Chester County, Pennsylvania, and that he/she, as such officer, being authorized to do so, executed the foregoing Storm Water Management Agreement and Declaration of Easement, for the purposes therein contained, by signing the name of such [Township/Borough] by himself/herself as such officer.

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

Notary Public

My commission expires:

(INDIVIDUAL OR HUSBAND AND WIFE ACKNOWLEDGMENT)

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF Lancaster/Berks/Chester)

On this ___ day of _____, 2001, before me, the subscriber, a notary public in and for the aforesaid Commonwealth and County, came the above named _____, known to me (or satisfactorily proven) to be the person(s) whose name(s) is/are subscribed on the within instrument, and acknowledged the foregoing Storm Water Management Agreement and Declaration of Easement to be his/her/their act and deed and desired the same to be recorded as such.

IN WITNESS WHEREOF, I have hereunto set my hand and notarial seal.

Notary Public

My commission expires:

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF Lancaster/Berks/Chester)

_____, who acknowledged themselves to be all of the partners of _____, a Pennsylvania general partnership, and that they, as such partners, being authorized to do so, executed the foregoing instrument for the purposes therein contained by signing the name of the partnership themselves as such partners.

My commission expires:

(CORPORATE DEVELOPER ACKNOWLEDGMENT)

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF Lancaster/Berks/Chester)

On this _____ day of _____, 200____, before me, a notary public, the undersigned officer, personally appeared _____, who acknowledged himself/herself to be the _____ of _____,
(title of officer) (name of corporation)

a corporation, and that as such officer, being authorized to do so, acknowledged the foregoing instrument for the purpose therein contained by signing the name of the corporation by himself/herself as _____.
(title of officer)

Notary Public

My commission expires:

JOINDER BY MORTGAGEE

_____ ("Mortgagee") as holder of a certain mortgage on the within-described Premises, which mortgage, in the amount \$_____, is dated _____, and is recorded or is about to be recorded in the Recorder of Deeds Office in and for Lancaster/Berks/Chester County, Pennsylvania, as well as any other mortgages which Mortgagee may now or hereafter hold on the Premises (all such mortgages hereinafter collectively referred to as the "Mortgages"), joins in, consents to, and expressly approves the grant of easements and other rights and privileges described in the attached Storm Water Management Agreement and Declaration of Easement (the "Agreement").

The Mortgagee, for itself, its successors and assigns (which shall include any assignee of the Mortgages and any purchaser of the Premises at a sale in foreclosure of the Mortgages or otherwise), hereby covenants and agrees that the rights and privileges herein granted with respect to the Premises shall not be terminated or disturbed by reason of any foreclosure or other action which may be instituted by the Mortgagee, its successors and assigns, as a result of any default under the Mortgages or the debt of instruments that such Mortgages secure. Mortgagee by consenting to the Agreement shall not by virtue of its interest as Mortgagee be deemed to have undertaken any of the obligations of the Grantor under the Agreement, including but not limited to construction, maintenance, inspection or indemnification.

IN WITNESS WHEREOF, Mortgagee hereby joins in the execution of the Agreement as of this _____ day of _____, 20____.

(Name of Mortgagee)

ATTEST: _____

By: _____

[SEAL]

(MORTGAGEE ACKNOWLEDGMENT)

COMMONWEALTH OF PENNSYLVANIA)

)SS:

COUNTY OF Lancaster/Berks/Chester)

On this, the _____ day of _____, 200__ before me, a notary public, the undersigned officer, personally appeared _____, who acknowledged (him/her) self to be the _____ of _____ a corporation, and that as such officer, being authorized to do so, acknowledged the foregoing instrument for the purpose therein contained by signing the name of the Bank by (him/her) self as _____.

Notary Public

My Commission Expires:

Representation and Warranty Concerning Mortgages
Affecting Proposed Development

I (We), _____ the undersigned, intending to be legally bound, represent and warrant to [Municipality] that there are not presently nor will there be prior to the recording of the Storm Water Management Agreement and Declaration of Easement Agreement any mortgages affecting the property which is being developed in accordance with the subdivision and/or land development plan titled _____, prepared by _____, drawing or project number _____, dated _____, last revised _____.

The undersigned understand(s) and agree(s) that [Municipality] will rely upon this statement when releasing the aforementioned subdivision and/or land development plan for recording.

Date

Signature

Signature

Signature

Signature