LOWER SAUCON TOWNSHIP
NORTHAMPTON COUNTY, PENNSYLVANIA

ORDINANCE NO. 2022-01

AMENDMENT TO THE CODE OF THE TOWNSHIP OF LOWER SAUCON

AN ORDINANCE OF THE TOWNSHIP OF LOWER SAUCON, COUNTY OF NORTHAMPTON, COMMONWEALTH OF PENNSYLVANIA REPEALING AND REPLACING, IN ITS ENTIRETY, CHAPTER 137 (STORMWATER MANAGEMENT) OF THE CODE OF THE TOWNSHIP OF LOWER SAUCON, ADOPTING AND ENACTING REGULATIONS DESIGNED TO MANAGE STORMWATER RUNOFF BY: MEETING LEGAL WATER QUALITY REQUIREMENTS UNDER STATE LAW TO PROTECT, MAINTAIN, RECLAIM, AND RESTORE EXISTING AND DESIGNATED USE OF THE WATERS OF THE COMMONWEALTH, MINIMIZING INCREASES IN STORMWATER VOLUME AND CONTROLLING PEAK FLOWS, MINIMIZING IMPERVIOUS SURFACES, PROVIDING REVIEW PROCEDURES AND PERFORMANCE STANDARDS FOR STORMWATER PLANNING AND MANAGEMENT, PRESERVING THE NATURAL DRAINAGE SYSTEMS TO THE EXTENT POSSIBLE, MANAGING STORMWATER IMPACTS CLOSE TO THE RUNOFF SOURCE, MAINTAINING GROUNDWATER RECHARGE TO PREVENT DEGRADATION OF SURFACE AND GROUNDWATER QUALITY, PRESERVING AND RESTORING THE FLOOD-CARRYING CAPACITY OF STREAMS, PREVENTING THE SCOUR AND EROSION OF STREAMBANKS AND STREAM BEDS, PROVIDING STANDARDS TO MEET NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIREMENTS, ADDRESSING CERTAIN REQUIREMENTS OF THE MUNICIPAL SEPARATE STORMWATER SEWER SYSTEM (MS4) NPDES PHASE II STORMWATER REGULATIONS, ADDRESSING THE REQUIREMENTS OF THE APPLICABLE ACT 167 STORMWATER MANAGEMENT PLANS, PROVIDING FOR PROPER OPERATION AND MAINTENANCE OF ALL STORMWATER MANAGEMENT FACILITIES AND BEST MANAGEMENT PRACTICES (BMPs) WITHIN LOWER SAUCON TOWNSHIP, PRESCRIBING PENALTIES FOR VIOLATIONS OF CHAPTER 137; AND BY REPEALING ALL OTHER ORDINANCES AND PARTS OF ORDINANCES IN CONFLICT WITH THE PROVISIONS CONTAINED HEREIN. THIS ORDINANCE CONTAINS SIGNIFICANT, SUBSTANTIVE CHANGES TO THE LOWER SAUCON TOWNSHIP STORMWATER REGULATIONS, AND SHOULD BE REVIEWED IN ITS

ENTIRETY FOR A COMPREHENSIVE UNDERSTANDING OF ITS PROVISIONS.

WHEREAS, Lower Saucon Township is a Township of the Second Class, Optional Plan of Government, located in Northampton County, Commonwealth of Pennsylvania; and

WHEREAS, the Township of Lower Saucon adopted Ordinance # 98-17 on May 20, 1998, enacting the Code of the Township of Lower Saucon (hereinafter referred to as the "Code"); and

WHEREAS, Lower Saucon Township is empowered to regulate land use activities that affect stormwater runoff by the authority of the Act of October 4, 1978, P.L. 864 (Act 167) 32 §680.1 et seq., as amended, the Stormwater Management Act; the Second Class Township Code, 53 P.S. §65101 et seq., as amended; and the Pennsylvania Municipalities Planning Code, 53 P.S. §10101 et seq., as amended; and;

WHEREAS, the Council of Lower Saucon Township desires to amend the Code of the Township of Lower Saucon to repeal and replace, in their entirety, the provisions of Chapter 137 relating to Stormwater Management within the Township, as further described in the Title above; and

WHEREAS, the Council of Lower Saucon Township has determined that the adoption of this Ordinance will be in the best interests of the Township and its residents, and will meet certain Federal and State requirements regarding the regulation of stormwater with the Township.

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NOW, THEREFORE, BE IT ENACTED AND ORDAINED by the Council of the Township of Lower Saucon, Northampton County, Commonwealth of Pennsylvania, that the provisions of the Code of the Township of Lower Saucon are hereby amended as follows:

Section 1. <u>Amendment to Chapter 137 (Stormwater Management).</u>

Chapter 137(Stormwater Management) is hereby deleted, in its entirety, and replaces as follows:

ARTICLE I

General Provisions

§ 137-1. Short title.

This chapter shall be known and may be cited as the "Lower Saucon Township Stormwater Management Ordinance."

§ 137-2. Statement of findings.

The Council of Lower Saucon Township, Northampton County, finds that:

A. Inadequate management of accelerated runoff of stormwater resulting from development throughout a watershed increases flood flows and velocities, contributes to erosion and sedimentation, changes the natural hydrologic patters, destroys aquatic habitat, elevates aquatic pollutant concentrations and loadings, overtaxes the carrying capacity of streams and storm sewers, greatly increases the cost of public facilities to carry and control stormwater, undermines floodplain management and flood control efforts in downstream communities, reduces groundwater recharge and threatens public health and safety.

B. A comprehensive program of stormwater management, including reasonable regulation of development and activities causing accelerated erosion and loss of natural infiltration, is fundamental to the public health, safety and welfare and the protection of the people of the municipality and all of the people of the commonwealth, their resources and the environment.

C. Stormwater can be an important resource by providing groundwater recharge for water supplies and base flow of streams.

D. Public education n the control of pollution from stormwater is an essential component in successfully curbing the pollution of the waters of the commonwealth.

E. Federal and state regulations require that Lower Saucon Township implement a program of stormwater controls. Pursuant to those regulations, Lower Saucon Township has obtained a permit for stormwater discharges from their separate storm sewer systems under the National Pollutant Discharge Elimination System (NPDES)

F. Nonstormwater discharges to municipal separate storm sewer systems can contribute to pollution of waters of the commonwealth.

§ 137-3. Purpose.

The purpose of this chapter is to promise the public health, safety and welfare in Lower Saucon Township, Northampton County by minimizing the damages and maximizing the benefits of stormwater management described in § 137-2 of this chapter by provisions designed to:

A. Manage stormwater runoff impacts at their source by regulating activities which cause such problems.

B. Utilize and preserve the desirable existing natural drainage system.

C. Encourage infiltration of stormwater, where appropriate, to maintain groundwater recharge, to prevent degradation of surface and groundwater quality and to otherwise protect water resources.

D. Maintain the existing flows and quality of streams and watercourses in the Township and the commonwealth.

E. Preserve and restore the flood-carrying capacity of streams.

F. Provide for proper maintenance of all permanent stormwater management facilities in the Township.

G. Provide review procedures and performance standards for stormwater management facilities planning, design and management.

H. Manage stormwater impacts close to the runoff source and maximize the use of natural processes to assist with stormwater management.

I. Meet legal water quality requirements under state law, including regulations at 25 Pa. Code

§ 93.4a to protect and maintain existing uses and maintain the level of water quality to support those uses in all streams and to protect and maintain water quality in special protection streams.

J. Prevent scour and erosion of stream banks and streambeds.

K. Provide standards to meet the NPDES permit requirements.

§ 137-4. Statutory authority.

Lower Saucon Township is empowered to regulate these activities by the authority of the Act of October 4, 1978, P.L. 864 (Act 167), known as the "Stormwater Management Act," as amended (32 P.S. § 680.1 et seq.), in addition to the Municipalities Planning Code.

§ 137-5. Applicability.

A. The requirements of this chapter shall apply to the entire Township. Watershed areas are available for inspection at the Municipal Office. Maps of several watersheds are provided in Appendix B for general reference. These requirements shall only apply to stormwater management facilities constructed as part of any of the activities listed in this section, except for those facilities that are constructed by the Township.

B. The following activities are defined as regulated activities and shall be governed by this chapter:

(1) Land development.

(2) Subdivision.

(3) Construction of new or additional semipervious or impervious surfaces (driveways, parking lots, etc.).

(4) Construction of new buildings or additions to existing buildings.

(5) Diversion or piping of any natural or man-made stream channel.

(6) Installation of stormwater systems or appurtenances thereto.

(7) Regulated earth disturbance activities.

§ 137-6. Exemptions.

A. Areas outside the Delaware River (North) Watershed. Any proposed regulated activity that is not within the Delaware River (North) Watershed which would create 10,000 square feet or less of additional semipervious or impervious cover would be exempt from meeting the runoff release rate control provisions of this chapter, except as outlines in § 137-17B. All other requirements of this chapter are still applicable.

B. Areas within the Delaware River (North) Watershed. Any proposed regulated activity within the Delaware River (North) Watershed that meets the following criteria is exempt from meeting the runoff release rate control provisions of this chapter, except as outlined in § 137-17B. All other requirements of this chapter are still applicable.

Stormwater Management Exemption Criteria for Delaware River North Watershed

Total Parcel Size (acres)	Minimum Setback Distance[1] (feet)	Semi-Impervious and Impervious Area Exemption (square feet) Less Than
0 to 0.5	10	1,200
0.51 to 1	50	2,500
1.01 to 2	100	4,000
2.01 to 5	250	5,000
Greater than 5.01	500	7,500

NOTES:

[1] The minimum setback distance is measured between the proposed impervious area and/or stormwater control/structure/discharge point to the downslope property boundary. In lieu of meeting the minimum distance criteria, the developer may provide documentation for the Township approval from any professional authorized to perform this work under the Engineer, Land Surveyor, and the Geologist Registration Law, May 23, 1945, P.L. 913 No. 367 (63 P.S. § 148 et seq., P.L. 913, as amended) that the increased flows from the site leaves the site in the same manner as the predevelopment condition, and that there will be no adverse effects to the properties along the path of the flow(s) or that increased flow(s) will reach a natural watercourse or an existing stormwater management structure before adversely affecting any property along the path of the flow(s).

C. General conditions of exemptions. For the exemptions outlined in Subsections A and B above, the following general conditions apply:

(1) For development taking place in stages, the entire development plan must be used in determining conformance with these criteria.

(2) All semi-impervious and impervious areas indicated in exemption calculations are to be cumulative such that the exemption applies only once to a tract, and if the exemption amount is exceeded, it is not applicable and all previously exempted semi-impervious and impervious areas must be managed. May 20, 1998, which is the date of Township's

adoption of Chapter 145, Subdivision and Land Development, Ordinance No. 98-8, also known, now or formerly, as the "Subdivision and Land Development Ordinance of 1998," containing provisions empowered by the Stormwater Management Act, Act 167, shall be the starting date from which to consider tracts as existing conditions. Additional semi-impervious and impervious cover constructed after that date shall be considered new semipervious or new impervious cover for the purposes of these regulations.

(3) Impervious cover shall include, but not limited to, indoor living spaces, impervious liners, patios, garages, driveways, storage sheds and similar structures, any roof, parking or driveway areas and any new streets and sidewalks. The water surface area of a pool and the area of decks made of non-continuous material shall not be considered impervious.

(4) Any areas which may be designed to initially be semipervious (e.g., gravel, crushed stone, porous pavement, etc.) shall be considered impervious areas for the purposes of exemption evaluation. Any semipervious areas existing prior to May 20, 1998, shall be considered previous areas for purposes of exemption evaluation.

(5) Any exemption from the runoff release rate requirement of this chapter shall not relieve the developer from implementing such measures as are necessary to protect health, safety, property and state water quality requirement (as hereinafter defined). These measures include adequate and safe conveyance of stormwater on the site and as it leaves the site. Further, these exemptions do not relieve the developer from the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act or ordinance.

(6) No exemptions shall be provided for regulated activities as defined in § 137-5B(5) through § 137-5B(7) and G.

(7) No exemptions shall be provided from § 137-23, Additional design requirements.

(8) Agricultural activity is exempt from the rate control and drainage plan preparation requirements of this chapter, provided the activities and performed according to the requirements of Pa. Code 102;

(9) Timber harvesting activities are exempt from the rate control and drainage plan preparation requirements of this chapter, provided the activities are performed according to the requirements of 25 Pa. Code 102; and

(10) The Township may deny or revoke any exemption pursuant to this section at any time for any project that Township believes may pose a threat to public health, safety, property or the environment.

D. Prior drainage plan approval. Any regulated activity for which a drainage plan was previously prepared as part of a subdivision or land development proposal that received preliminary plan approval from the Township prior to the effective date of this chapter is exempt from the drainage plan preparation provisions of this chapter, except as cited in Subsection C(5), provided that the approved drainage plan included design of stormwater facilities to control runoff from the site currently proposed for regulated activities consistent with ordinance provisions in effect at the time of approval and the approval has not lapsed under the Municipalities Planning Code. If significant revisions are made to the drainage plan after both the preliminary plan approval and the effective date of this chapter, preparation of a new drainage plan, subject to the provisions of this chapter,

shall be required. Significant revisions would include a change in control methods or techniques, relocation or redesign of control measures or changes necessary because soil or other conditions are not as stated on the original drainage plan. The project applicant must confirm that all proposed stormwater facilities within the project watershed were constructed or are currently financially secured, and that all design assumptions within the project watershed have been complied with for all development within the watershed.

§ 137-7. Effect on other provisions.

Approvals issued pursuant to this chapter do not relieve the developer of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act or ordinance.

§ 137-8. Duty of persons engaged in land development.

Notwithstanding any provisions of this chapter, including exemption and waiver provisions, any landowner and any person engaged in the alteration or development of land which may affect stormwater runoff characteristics shall implement such measures as are reasonably necessary to prevent injury to health, safety or other property. Such measures shall include such actions as are required to manage the rate, volume, direction and quality of resulting stormwater runoff in a manner which otherwise adequately protects health and property from possible injury.

ARTICLE II
Terminology

§ 137-9. Word Usage.

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

A. Words used in the singular include the plural, and those used in the plural include the singular.

B. Words used in the present tense include the future tense.

C. Words used in the masculine gender include the feminine gender; those used in the feminine gender include the masculine gender.

D. 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.

E. The words "person," "developer," "subdivider" and "owner" include a corporation, unincorporated association, partnership or other legal entity, as well as an individual.

F. The word "building" includes a structure and shall be construed as if followed by the phrase "or part thereof."

G. The words "should" and "may" are permissive; the words "shall," "must" and "will" are mandatory and directive.

H. The words "ordinance," "chapter" and "regulation" shall mean the same thing. These regulations will be adopted by ordinance, but they will be incorporated as a chapter in the Codified Ordinance Book.

§ 137-10. Definitions.

The following terms shall have, throughout this chapter, the meanings given herein. Where a term is not defined below but is defined by Chapter 145, Subdivision and Land Development, of the Code of Lower

Saucon Township, the definition from Chapter 145, Subdivision and Land Development, of the Code of Lower Saucon Township shall apply.

ACCELERATED EROSION – The removal of the surface of the land through the combined action of human activities and natural processes, at a rate greater than would occur because of the natural processes alone.

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

BEST MANAGEMENT PRACTICE (BMP) – Activities, facilities, measures or procedures used to manage stormwater quantity and quality impacts from the regulated activities listed in § 137-5, to meet state water quality requirements, to promote groundwater recharge and to otherwise meet the purposes of this chapter.

BEST MANAGEMENT PRACTICE OPERATIONS AND MAINTENANCE PLAN – Documentation, included as part of a drainage plan, detailing the proposed BMPs, how they will be operated and maintained and who will be responsible.

BIORETENTION – Densely vegetated, depressed features that store stormwater and filter it through vegetation, mulch, planting soil, etc. Ultimately, stormwater is evapotranspirated, infiltrated or discharged. Optimal bioretention areas mimic natural forest ecosystems in terms of species diversity, density, distribution, use of native plants, etc.

BUFFER –

A. STREAMSIDE BUFFER – A zone of variable width located along a stream that is vegetated and is designed to filter pollutants from runoff.

B. SPECIAL GEOLOGIC FEATURE BUFFER – A required isolation distance from a special geologic feature to a proposed BMP needed to reduce the risk of sinkhole formation due to stormwater management activities.

CAPTURE/REUSE – Stormwater management techniques such as cisterns and rain barrels which direct runoff into storage devices, surface or subsurface, for later reuse, such as for irrigation of gardens and other planted areas. Because this stormwater is utilized and no pollutant discharge results, water quality performance is superior to other noninfiltration BMPs.

CARBONATE BEDROCK – Rock consisting chiefly of carbonate minerals, such as limestone and dolomite; specifically a sedimentary rock composed of more than 50% by weight of carbonate minerals that underlies soil or other unconsolidated, superficial material.

CISTERN – A reservoir or tank for storing rainwater.

CLOSED DEPRESSION – A distinctive bowl-shaped depression in the land surface. It is characterized by internal drainage, varying magnitude and an unbroken ground surface.

COLLECTOR – Any watercourse, swale, pipe, culvert or other stormwater control structure receiving runoff from an upstream watershed of 40 acres or less.

CONCENTRATED DRAINAGE DISCHARGE – Stormwater runoff leaving a property via a point source.

CONSERVATION DISTRICT – The Northampton County Conservation District.

CONSTRUCTED WETLANDS – Constructed wetlands are similar to wet ponds (see below) and consist of a basin which provides for necessary stormwater storage as well as a permanent pool or water level, planted with wetland vegetation. To be successful, constructed wetlands must have adequate natural hydrology (both runoff inputs as well as soils and water table which allow for maintenance of a permanent pool of water). In these cases, the permanent pool must be designed carefully, usually with shallow edge benches, so that water levels are appropriate to support carefully selected wetland vegetation.

CULVERT – A pipe, conduit or similar structure including appurtenant works which carries surface water.

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

DEP – The Pennsylvania Department of Environmental Protection (formerly the Pennsylvania Department of Environmental Resources).

DESIGN STORM – The depth and time distribution of precipitation from a storm event measured in probability of occurrence (e.g., one-hundred-year storm) and duration (e.g., twenty-four-hour) and used in computing stormwater management control systems.

DETENTION BASIN – A basin designed to retard stormwater runoff by temporarily storing the runoff and releasing it at a predetermined rate.

DEVELOPER – A person, partnership, association, corporation or other entity, or any responsible person therein or agent thereof, that undertakes any regulated activity of this chapter.

DEVELOPMENT SITE (SITE) – The specific tract of land for which a regulated activity is proposed.

DIFFUSED DRAINAGE – See "sheet flow."

DIRECT RECHARGE/SUBSURFACE BMP – A BMP designed to direct runoff to groundwater recharge without providing for vegetative uptake. Examples include infiltration trenches, seepage beds, drywells and stormwater drainage wells such that nearly all runoff becomes recharge to groundwater.

DRAINAGE EASEMENT – A right granted by a landowner to a grantee, allowing the use of private land for stormwater management purposes.

DRAINAGE PLAN – The documentation of the proposed stormwater quantity and quality management controls to be used for a given development site, including a BMP operations and maintenance plan, the contents of which are established in § 137-26.

EARTH DISTURBANCE ACTIVITY – A construction or other human activity which disturbs the surface of the land, including but not limited to clearing and grubbing, grading, excavations, embankments, road

maintenance, building construction and the moving, depositing, stockpiling or storing of soil, rock or earth materials.

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

EXISTING USES – Those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards. (25 Pa. Code § 93.1).

FILL – Man-made deposits of natural soils or rock products and waste materials.

FILTER STRIPS – See "vegetated buffers."

FREEBOARD – The incremental depth in a stormwater management structure, provided as a safety factor of design, above that required to convey or control the design runoff event.

GROUNDWATER RECHARGE – Replenishment of existing natural underground water supplies.

HARDSHIP WAIVER REQUEST – A written request for a waiver alleging that the provisions of this chapter inflict unnecessary hardship upon the developer. A hardship waiver does not apply to and is not available from the water quality provisions of this chapter and should not be granted.

HOT SPOT LAND USES – A land use or activity that generates higher concentrations of hydrocarbons, trace metals or other toxic substances than typically found in stormwater runoff. These land uses are listed in § 137-15K. [Amended 6-3-2009 by Ord. No. 2009-03]

HYDROLOGIC SOIL GROUP (HSG) – Soils are classified into four HSGs (A, B, C and D) to indicate the minimum infiltration rates, which are obtained for bare soil after prolonged wetting. The Natural Resources Conservation Service (NRCS) of the U.S. Department of Agriculture defines the four groups and provides a list of most of the soils in the United States and their group classification. The soils in the area of the development site may be identified from a soil survey report that can be obtained from local NRCS offices or conservation district offices. Soils become less permeable as the HSG varies from A to D.

IMPERVIOUS SURFACE (IMPERVIOUS COVER) – A surface which prevents the percolation of water into the ground. [(See also § 137-6C(3).]

INFILTRATION PRACTICE – A practice designed to direct runoff into the ground, i.e., French drain, seepage pit, seepage trench or bioretention area.

INTERCEPTOR – Any watercourse swale, pipe, culvert or other stormwater control structure receiving stormwater runoff from an upstream watershed of over 40 acres.

KARST – A type of topography or landscape characterized by surface depressions, sinkholes, rock pinnacles and an uneven bedrock structure, underground drainage and caves. Karst is usually formed on carbonate rocks, such as limestones or dolomites and sometimes gypsum.

LAND DEVELOPMENT – Any of the following activities:

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

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

(2) The division or allocation of land or space, whether initially or cumulatively, between or among two or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups or other features.

B. A subdivision of land.

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

LOADING RATE – The ratio of the land area draining to the system, as modified by the weighting factors in § 137-17B, compared to the base area of the infiltration system.

LOCAL RUNOFF CONVEYANCE FACILITIES – Any natural channel or man-made conveyance system which has the purpose of transporting runoff from the site to the mainstem.

LOW IMPACT DEVELOPMENT – A development approach that promotes practices that will minimize postdevelopment runoff rates and volumes thereby minimizing needs for artificial conveyance and storage facilities. Site design practices include preserving natural drainage features, minimizing impervious surface area, reducing the hydraulic connectivity of impervious surfaces and protecting natural depression storage.

MAINSTEM (MAIN CHANNEL) – Any stream segment or other conveyance in a Dual Release Rate or Condition No Detention I subarea used as a reach in the Catasauqua Creek study area hydrologic model. In Conditional No Detention II subareas, the main channel is the Lehigh River.

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.

MARYLAND STORMWATER DESIGN MANUAL – A stormwater design manual written by the Maryland Department of the Environment and the Center for Watershed Protection. As of November 2006, the Manual can be obtained through the following Web site: www.mde.state.md.us.

MINIMUM DISTURBANCE/MINIMUM MAINTENANCE PRACTICES (MD/MM) – Site design practices in which careful limits are placed on site clearance prior to development allowing for maximum retention of existing vegetation (woodlands and other), minimum disturbance and compaction of existing soil mantle and minimum site application of chemicals postdevelopment. Typically, MD/MM includes disturbance setback criteria from buildings as well as related site improvements such as walkways, driveways, roadways and any other improvements. These criteria may vary by community context as well as by type of development being proposed. Additionally, MD/MM also shall include provisions (e.g., deed restrictions, conservation easements) to protect these areas from future disturbance and from application of fertilizers, pesticides and herbicides.

NO-HARM RUNOFF QUANTITY OPTION – The option of using a less restrictive runoff quantity control if it can be shown that adequate and safe runoff conveyance exists and that the less restrictive control would not adversely affect health, safety and property.

NPDES – National Pollutant Discharge Elimination System.

NRCS – Natural Resource Conservation Service, U.S. Department of Agriculture (formerly the Soil Conservation Service).

OIL/WATER SEPARATOR – A structural mechanism designed to remove free oil and grease (and possibly solids) from stormwater runoff.

OUTFALL – "Point source" as described in 40 CFR 122.2 at the point where the municipality's storm sewer system discharges to surface waters of the commonwealth.

OWNER – One with an interest in and often dominion over a property.

PEAK DISCHARGE – The maximum rate of flow of stormwater runoff at a given location and time resulting from a specified storm event.

PENN STATE RUNOFF MODEL (PSRM) – The computer-based hydrologic modeling technique adapted to each watershed for the Act 167 Plans. The model was calibrated to reflect actual flow values by adjusting key model input parameters.

PERSON – An individual, partnership, public or private association or corporation, firm, trust, estate, municipality, governmental unit, public utility or any other legal entity whatsoever which is recognized by law as the subject of rights and duties.

POINT SOURCE – Any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel or conduit from which stormwater is or may be discharged, as defined in state regulations at 25 Pa. Code § 92.1.

PRELIMINARY SITE INVESTIGATION – The determination of the depth to bedrock, the depth to the seasonal high water table and the soil permeability for a possible infiltration location on a site through the use of published data and on-site surveys. In carbonate bedrock areas, the location of special geologic features must also be determined along with the associated buffer distance to the possible infiltration practice. See Appendix G.

PRE-TREATMENT – Measures implemented for Hot Spot Land Uses designed to reduce the concentration of hydrocarbons, trace metals and other toxic substances to level s typically found in stormwater runoff.

PUBLIC WATER SUPPLIER – A person who owns or operates a public water system.

PUBLIC WATER SYSTEM – A system which provides water to the public for human consumption which has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year (See 25 Pa. Code Chapter 109).

QUALIFIED GEOTECHNICAL PROFESSIONAL – A licensed professional geologist or a licensed professional engineer who has a background or expertise in geology or hydrogeology.

RATIONAL METHOD – A method of peak runoff calculation using a standardized runoff coefficient (rational "c," acreage of tract and rainfall intensity determined by return period and by the time necessary for the entire tract to contribute runoff. The Rational Method formula is stated as follows: Q = ciA, where "Q" is the calculated peak flow rate in cubic feet per second, "c" is the dimensionless runoff coefficient (see Appendix C), "i" is the rainfall intensity in inches per hour, and "A" is the area of the tract in acres.

REACH – Any of the natural or man-made runoff conveyance channels used for watershed runoff modeling purposes to connect the subareas and transport flows downstream.

RECHARGE VOLUME (REV) – The portion of the water quality volume (WQv) used to maintain groundwater recharge rates at development sites. (See § 137-14J).

REGULATED ACTIVITIES – All activities that may affect stormwater runoff, including land development and earth disturbance activity, which are subject to regulation by this chapter.

REGULATED EARTH DISTURBANCE ACTIVITIES – Activity involving earth disturbance, other than agricultural activity, subject to regulation under 25 Pa. Code 92.25, Pa Code 102, or the clean streams law.

RELEASE RATE – The percentage of the predevelopment peak rate of runoff for a development site to which the postdevelopment peak rate of runoff must be controlled to avoid peak flow increases throughout the watershed.

RETURN PERIOD – An expression of the intensity of an event based on its statistical chance of being equaled or exceeded in any given year. An event with a 1% chance in any given year is stated to have a 100-year return period. An event with a 50% chance is stated to have a 2-year return period. Over a very long period of record, events might be expected to recur on average in accordance with their return period.

ROAD MAINTENANCE – Earth disturbance activities within the existing road cross section such as grading and repairing existing unpaved road surfaces, cutting road banks, cleaning or clearing drainage ditches and other similar activities.

RUNOFF – That part of precipitation which flows over the land.

RUNOFF BMP – A BMP designed for essentially the full volume of runoff entering the BMP to be discharged off-site.

SALDO – The current (or otherwise applicable) version of Chapter 145, Subdivision and Land Development, of the Code of Lower Saucon Township.

SCS – The former Soil Conservation Service, U.S. Department of Agriculture, now known as the "NRCS."

SEDIMENT TRAPS/CATCH BASIN SUMPS – Chambers which provide storage below the outlet in a storm inlet to collect sediment, debris and associated pollutants, typically requiring periodic cleanout.

SEEPAGE PIT/SEEPAGE TRENCH – An area of excavated earth filled with loose stone or similar material and into which surface water is directed for infiltration into the ground.

SEPARATE STORM SEWER SYSTEM – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels or storm drains) primarily used for collecting and conveying stormwater runoff.

SHEET FLOW – Stormwater runoff flowing in a thin layer over the ground surface.

SOIL-COVER-COMPLEX METHOD – A method of runoff computation developed by NRCS which is based upon relating soil type and land use/cover to a runoff parameter called a "curve number."

SPECIAL GEOLOGIC FEATURES – Carbonate bedrock features, including, but not limited to, closed depressions, existing sinkholes, fracture traces, lineaments, joints, faults, caves, pinnacles and geologic contacts between carbonate and noncarbonate bedrock which may exist and must be identified on a site when stormwater management BMPs are being considered.

STATE WATER QUALITY REQUIREMENTS – As defined under state regulations protection of designated and existing uses (See 25 Pa. Code Chapters 93 and 96), including:

A. Each stream segment in Pennsylvania has a designated use, such as cold water fish or potable water supply, which is listed in Chapter 93. These uses must be protected and maintained under state regulations.

B. “Existing uses" are those attained as of November 1975, regardless whether they have been designated in Chapter 93. Regulated earth disturbance activities must be designed to protect and maintain existing uses and maintain the level of water quality necessary to protect those uses in all streams, and to protect and maintain water quality in special protection streams.

C. Water quality involves the chemical, biological and physical characteristics of surface water bodies. After regulated earth disturbance activities are complete, these characteristics can be impacted by addition of pollutants such as sediment, and changes in habitat through increased flow volumes and/or rates as a result of changes in land surface area from those activities. Therefore, permanent discharges to surface waters must be managed to protect the stream bank, streambed and structural integrity of the waterway to prevent these impacts.

STORAGE INDICATION METHOD – A method of routing or moving inflow hydrograph through a reservoir or detention structure. The method solves the mass conservation equation to determine an outflow hydrograph as it leaves the storage facility.

STORM DRAINAGE PROBLEM AREAS – Areas which lack adequate stormwater collection and/or conveyance facilities and which present a hazard to persons or property. These areas are either documented in Appendix B of this chapter or identified by the Township or Township Engineer.

STORM SEWER – A system of pipes or other conduits which carries intercepted surface runoff, street water and other wash waters, or drainage, but excludes domestic sewage and industrial wastes.

STORMWATER – The surface runoff generated by precipitation reaching the ground surface.

STORMWATER DRAINAGE WELLS – Wells for injection of stormwater to the subsurface that are regulated by the U.S. Environmental Protection Agency to protect underground sources of drinking water.

STORMWATER FILTERS – Any number of structural mechanisms such as multichamber catch basins, sand/peat filters, sand filters, and so forth which are installed to intercept stormwater flow and remove pollutants prior to discharge. Typically, these systems require periodic maintenance and cleanout.

STORMWATER MANAGEMENT FACILITIES – All facilities and features such as infiltration practices, pipes, catch basins, inlets, culverts, open channels, ditches, swales, stormwater detention facilities, etc., used to transmit, infiltrate, or temporarily store surface water runoff.

STORMWATER MANAGEMENT PLAN – Any plan for managing stormwater runoff adopted by Northampton County for a watershed as required by the Act of October 4, 1978, P.L. 864 (Act 167), and known as the "Storm Water Management Act."

STREAM – A watercourse.

SUBAREA – The smallest unit of watershed breakdown for hydrologic modeling purposes for which the runoff control criteria have been established in the stormwater management plan.

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

SWALE – A low-lying stretch of natural or man-made land which gathers or carries surface water runoff. See also "vegetated swale."

TECHNICAL BEST MANAGEMENT PRACTICE MANUAL AND INFILTRATION FEASIBILITY REPORT, NOVEMBER 2002 – The report written by Cahill Associates that addresses the feasibility of infiltration in carbonate bedrock areas in the Little Lehigh Creek Watershed. The report is available at the Lehigh Valley Planning Commission offices.

TIMBER HARVESTING ACTIVITIES – Earth disturbance activities, including the construction of skid trails, logging roads, landing areas and other similar logging or silvicultural practices.

TOWNSHIP – Lower Saucon Township, Northampton County, Pennsylvania.

TRASH/DEBRIS COLLECTORS – Racks, screens or other similar devices installed in a storm drainage system to capture coarse pollutants trash, leaves, etc.

VEGETATED BUFFERS – Gently sloping areas that convey stormwater as sheet flow over a broad, densely vegetated earthen area, possibly coupled with the use of level spreading devices. As water quality BMPs, Vegetated buffers serve to filter pollutants from runoff and promote infiltration. Vegetated buffers should be situated on minimally disturbed soils, have low-flow velocities and extended residence times. Vegetated buffers may be, but are not restricted to, use in riparian (streamside) conditions.

VEGETATED ROOFS – Vegetated systems installed on roofs that generally consist of a waterproof layer, a root-barrier, drainage layer (optional), growth media, and suitable vegetation. Vegetated roofs store and eventually evapotranspirate the collected rooftop rainfall; overflows may be provided for larger storms.

VEGETATED SWALES – Vegetated earthen channels designed to convey and possibly treat stormwater. As water quality BMPs, these are broad, shallow, densely vegetated, earthen channels designed to treat stormwater through infiltration, evapotranspiration and sedimentation. Swales should be gently sloping with low=flow velocities to prevent erosion. Check dams may be added to enhance performance.

VEGETATED/SURFACE BMP – A BMP designed to provide vegetative uptake and soil renovation or surface infiltration of runoff. Capture/reuse BMPs are included if the captured runoff is applied to vegetated areas. Examples include bioretention and surface infiltration basins.

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

WATERS OF THE COMMONWEALTH – Any and all rivers, streams, creeks, rivulets, impoundments, ditches, watercourses, storm sewers, lakes, dammed water, wetlands, ponds, springs and all other bodies or channels of conveyance of surface water, or parts thereof, whether natural or artificial, within or on the boundaries of this Commonwealth.

WATER QUALITY INSERTS – Any number of commercially available devices that are inserted into storm inlets to capture sediment, oil, grease, metals, trash, debris, etc.

WATER QUALITY VOLUME (WQv) – The increase in runoff volume on a development site associated with a two-year, twenty-four-hour storm event.

WATERSHED – The entire region or area drained by a river or other body of water, whether natural or artificial.

WET DETENTION PONDS – A basin that provides for necessary stormwater storage as well as a permanent pool of water. To be successful, wet ponds must have adequate natural hydrology (both runoff inputs as well as soils and water table which allow for maintenance of a permanent pool of water) and must be able to support a healthy aquatic community so as to avoid creation of mosquito and other health and nuisance problems.

ARTICLE III
Stormwater Management

§ 137-11. General requirements.

A. All regulated activities in the Township shall be subject to the stormwater management requirements of this chapter.

B. Storm drainage systems shall be provided to permit unobstructed flow in natural watercourses except as modified by stormwater detention facilities, recharge facilities, water quality facilities, pipe systems or open channels consistent with this chapter.

C. The existing locations of concentrated drainage discharge onto adjacent property shall not be altered without prior written approval of the affected property owner(s).

D. Areas of existing diffused drainage discharge onto adjacent property shall be managed such that, at minimum, the peak diffused flow does not increase in the general direction of discharge, except as otherwise provided in this chapter. If diffused flow is proposed to be concentrated and discharged onto adjacent property, the developer must document that there are adequate downstream conveyance facilities to safely transport the concentrated discharge to the point of pre-development flow concentration, to the stream reach or otherwise prove that no harm will result from the concentrated discharge. Areas of existing diffused drainage discharge shall be subject to any applicable release rate criteria in the general direction of existing discharge, whether they are proposed to be concentrated or maintained as diffused drainage areas.

E. Where a site is traversed by watercourses other than those for which a 100-year floodplain is defined by the Township, there shall be provided drainage easements conforming substantially with the line of such watercourses. The width of any easement shall be adequate to provide for unimpeded flow of storm runoff based on calculations made in conformance with §137-14 of this Ordinance for the 100-year return period runoff and to provide a freeboard allowance of one-half (0.5) foot above the design water surface level. The terms of the easement shall prohibit excavation, the placing of fill or structures, and any alterations which may adversely affect the flow of stormwater within any portion of the easement. Also, periodic maintenance of the easement to ensure proper runoff conveyance shall be required. Watercourses for which the 100-year floodplain is formally defined are subject to the applicable Township floodplain regulations.

F. Post-construction BMPs shall be designed, installed, operated and maintained to meet the requirements of the Clean Streams Law and implementing regulations, including the established practices in 25 Pa. Code Chapter 102 and the specifications of this chapter.

G. No earth disturbance activities associated with any regulated activities shall commence until approval by the Township of a plan which demonstrates compliance with the requirements of this chapter.

H. Techniques described in Appendix F (Low-Impact Development) of this chapter are encouraged because they reduce the costs of complying with the requirements of this chapter and the commonwealth water quality requirements.

I. Infiltration for stormwater management is encouraged where soils and geology permit, consistent with the provisions of this chapter and, where appropriate, the Recommendation Chart for Infiltration Stormwater Management BMPs in Carbonate Bedrock in Appendix D of this chapter.

§ 137-12. Stormwater management districts.

A. To implement the provisions of the several DEP approved Act 167 stormwater management plans that include areas of the Township, the Township is hereby divided into stormwater management districts consistent with the release rate maps presented in the plans. The boundaries of the stormwater management districts are shown on official maps which are available for inspection at the Township office. Any areas of the Township which lie outside of a DEP approved stormwater management plan area are subject to one-hundred-percent release rate criteria.

B. Description of stormwater management districts not within the Delaware River (North) Watershed. In all stormwater management districts not within the Delaware River North Watershed, the two-year postdevelopment peak discharge must be controlled to 30% of the predevelopment two-year runoff peak. Two types of stormwater management districts are applicable, namely Conditional/Provisional No Detention Districts and Dual Release Rate Districts, which are further regulated as described below.

(1) Conditional/Provisional No Detention Districts. Within these districts, the capacity of the local runoff conveyance facilities (as defined in Article II) must be calculated to determine if adequate capacity exists. For this determination, the developer must calculate peak flows assuming that the site is developed as proposed and that the remainder of the local watershed is in the existing condition. The developer must also calculate peak flows assuming that the entire local watershed is developed per current zoning and that all new development would use the runoff controls specified by this chapter. The larger of the two peak flows calculated will be used in determining if adequate capacity exists. If the site is found unsuitable for infiltration (and only to the extent that it is found unsuitable) per § 137-17 and adequate capacity exists to safely transport runoff from the site to the main channel (as defined in Article II), these watershed areas may discharge postdevelopment peak runoff without peak rate control for any storms greater than the two-year storm. If the capacity calculations show that the local runoff conveyance facilities lack adequate capacity, the developer shall either use a one-hundred-percent release rate control or provide increased capacity of downstream elements to convey increased peak flows consistent with § 137-13S. Any capacity improvements must be designed to convey runoff from development of all areas tributary to the improvement consistent with the capacity criteria specified in § 137-13D. By definition, a storm drainage problem area associated with the local runoff conveyance facilities indicates that adequate capacity does not exist. Sites in these districts are still required to meet all of the water quality requirements of this chapter.

(2) Dual Release Rate Districts. Within these districts, the ten-, twenty-five-, and one-hundred-year postdevelopment peak runoff must be controlled to the stated percentage of the predevelopment peak. Release rates associated with the ten- through one-hundred-year events vary from 50% to 100%, depending upon location in the watershed.

C. Description of stormwater management districts within the Delaware River (North) Watershed. Two types of stormwater management districts are applicable to the areas of the Township within this watershed. These are the One-Hundred-Percent Release Rate District and the Seventy-Five-Percent Release Rate District as described below.

(1) One-Hundred-Percent Release Rate Districts. These subareas are not expected to incur a great deal of development growth due to location, topography, soils or a combination of all three factors. Also, the location in the watershed of these subareas is of minor importance in supporting the overall watershed level runoff control. Therefore, these areas are allowed to release development runoff at a rate that does not exceed the existing rates of runoff.

(2) Seventy-Five-Percent Release Rate Districts. Certain subareas require the control of stormwater runoff to a portion of the existing runoff equal to 75%. These areas are located in upper reaches of the watershed. In order to ensure uniform watershed-level

runoff control, the assignment of this release rate on a widespread basis will uniformly restrict the future runoff in a fashion that favors no particular subwatershed.

§ 137-13. Stormwater management district implementation.

A. Applicants shall provide a comparative pre- and post-construction stormwater management hydrograph analysis for each direction of discharge and for the site overall to demonstrate compliance with the provisions of this chapter.

B. Any stormwater management controls required by this chapter and subject to a dual release rate criteria shall meet the applicable release rate criteria for each of the two-, ten-, twenty-five-, and one-hundred-year return period runoff events consistent with the calculation methodology specified in §137-14 of this chapter.

C. The exact location of the stormwater management district boundaries as they apply to a given development site shall be determined by mapping the boundaries using the two-foot topographic contours provided as part of the drainage plan. The district boundaries as originally drawn coincide with topographic divides or, in certain instances, are drawn from the intersection of the watercourse and a physical feature such as the confluence with another watercourse or a potential flow obstruction (e.g., road, culvert, bridge, etc.). The physical feature is the downstream limit of the subarea, and the subarea boundary is drawn from that point up slope to each topographic divide along the path perpendicular to the contour lines.

D. Any downstream capacity analysis conducted in accordance with this chapter shall use the greater of §137-19E or the following criteria for determining adequacy for accepting increased peak flow rates:

(1) Natural or man-made channels or swales must be able to convey the increased runoff associated with a two-year return period event within their banks at velocities consistent with protection of the channels from erosion.

(2) Natural or man-made channels or swales must be able to convey the increased twenty-five-year return period runoff without creating any hazard to persons or property.

(3) Culverts, bridges, storm sewers or any other facilities which must pass or convey flows from the tributary area must be designed in accordance with the Pennsylvania Department of Environmental Protection (DEP) Chapter 105 regulations (if applicable) and, at minimum, pass the increased twenty-five-year return period runoff.

E. For a proposed development site located within one release rate category subarea, the total runoff from the site shall meet the applicable release rate criteria. For development sites with multiple directions of runoff discharge, individual drainage directions may be designed for up to a one-hundred-percent release rate so long as the total runoff from the site is controlled to the applicable release rate.

F. For a proposed development site located within two or more release category subareas, the peak discharge rate from any subarea shall be the pre-development peak discharge for that subarea multiplied by the applicable release rate. The calculated peak discharges shall apply regardless of whether the grading plan changes the drainage area by subarea. An exception to the above may be granted if discharges from multiple subareas recombine in proximity to the site. In this case, peak discharge in any direction may be a one-hundred-percent release rate, provided that the overall site discharge meets the weighted average release rate.

G. For sites straddling major watershed divides (e.g., Monocacy Creek and Bushkill Creek), runoff volumes shall be managed to prevent diversion of runoff between watersheds, as practicable;

H. Within a release rate category area, for a proposed development site which has areas which drain to a closed depression(s), the design release from the site will be the lesser of (a) the applicable release rate flow assuming no closed depression(s) or (b) the existing peak flow actually leaving the site. In cases where (b) would result in an unreasonably small design release, the design discharge of less than or equal to the release rate will be determined by the available downstream conveyance capacity to the main channel calculated using Chapter §137-13D of this Ordinance and the minimum orifice criteria;

I. Off-site areas which drain through a proposed development site are not subject to release rate criteria when determining allowable peak runoff rates. However, on-site drainage facilities shall be designed to safely convey off-site flows through the development site using the capacity criteria in Chapter §137-13D of this Ordinance and the detention criteria in this chapter. In addition to the criteria in Chapter §137-13D of this Ordinance, on-site conveyance systems designed to carry runoff to a detention basin must be able to transport the basin's 100-year tributary flow either in-system, in-gutter or overland;

J. For development sites proposed to take place in phases, all detention ponds shall be designed to meet the applicable release rate(s) applied to all site areas tributary to the proposed pond discharge direction. All site tributary areas will be assumed as developed, regardless of whether all site tributary areas are proposed for development at that time. An exception shall be sites with multiple detention ponds in series where only the downstream pond must be designed to the stated release rate.

K. Where the site area to be impacted by a proposed development activity differs significantly from the total site area, only the proposed impact area shall be subject to the release rate criteria. The impact area includes any proposed cover or grading changes.

L. Development proposals which, through groundwater recharge or other means, do not increase either the rate or volume of runoff discharged from the site compared to pre-development are not subject to the release rate provisions of this chapter.

M. "No Harm" Water Quantity Option - For any proposed development site, the developer has the option of using a less restrictive runoff control if the developer can prove that special circumstances exist for the proposed development site and that "no harm" would be caused by discharging at a higher runoff rate than that specified by this Ordinance. Special circumstances are defined as any hydrologic or hydraulic aspects of the development itself not accommodated by the runoff control standards of this Ordinance. Proof of "no harm" would have to be shown from the development site through the remainder of the downstream drainage network to the confluence with the Lehigh River. Proof of "no harm" must be shown using the capacity criteria specified in Section §137-13D. of this Ordinance 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) Any available capacity in the downstream conveyance system as documented by a developer may be used by the developer only in proportion to his development site acreage relative to the total upstream undeveloped acreage from the identified capacity (i.e. if his site is 10% of the upstream undeveloped acreage, he may use up to 10% of the documented downstream available capacity);

(2) Developer-proposed runoff controls which would generate increased peak flow rates at storm drainage problem areas would, by definition, be precluded from successful attempts to prove "no harm" and

(3) Any downstream capacity improvements proposed by the developer as part of a "no harm" justification would be designed using the capacity criteria specified in Section §137-13D of this Ordinance. Peak flow contributions to the proposed improvements shall be calculated as the larger of: (1) assuming the local watershed is in the existing condition, or (2) assuming that the local watershed is developed per current zoning and using the specified runoff controls.

Any "no harm" justifications shall be submitted by the developer as part of the Drainage Plan submission per Article 4 of this Ordinance. Developers submitting "no harm" justifications must still meet all of the water quality requirements of this Ordinance. The Township will process all eligible "no harm" requests in accordance with §137-14.1(O) of this Ordinance

N. Capacity improvements.

(1) In certain instances, primarily within the Conditional/Provisional No Detention areas, local drainage conditions may dictate more stringent levels of runoff control than those based upon protection of the entire watershed. In these instances, if the developer could prove that it would be feasible to provide capacity improvements to relieve the capacity deficiency in the local drainage network, then the capacity improvements could be provided by the Developer in lieu of runoff controls on the development site. Peak flow calculations shall be done assuming that the local watershed is in the existing condition and then assuming that the local watershed is developed per current zoning and using the specified runoff controls. Any capacity improvements would be designed using the larger of the above peak flows and the capacity criteria specified in Subsection 137-13D of this section. All new development in the entire subarea(s) within which the proposed development site is located shall be assumed to implement the developer's proposed discharge control, if any.

O. Release Rates need to be met year round. Designs involving BMPs that function differently in winter versus non-winter conditions (e.g., capture/reuse with spray irrigation shut off for the winter) must still meet release rates during the winter.

§ 137-14. Calculation methodology.

A. Stormwater runoff from all development sites shall be calculated using either the Rational Method or the Soil-Cover-Complex Methodology.

B. Infiltration BMP loading rate percentages.

(1) Infiltration BMP loading rate percentages in the Recommendation Chart for Infiltration Stormwater Management BMPs in Carbonate Bedrock in Appendix D[1] shall be calculated as follows:

$$\left(\frac{\text{Area Tributary to infiltration BMP}}{\text{Base area of infiltration BMP}}\right) * 100\%$$

(1) The area tributary to the infiltration BMP shall be weighted as follows:
(a) All disturbed areas to be made impervious: weight at 100%.
(b) All disturbed areas to be made pervious: weight at 50%.
(c) All undisturbed pervious areas: weight at 0%.
(d) All existing impervious areas: weight at 100%.

C. Soil thickness.

(1) Soil thickness is to be measured from the bottom of any proposed infiltration system. The effective soil thickness in the Recommendation Chart for Infiltration Stormwater Management BMPs in Carbonate Bedrock in Appendix D is the measured soil thickness multiplied by the thickness factor based on soil permeability (as measured by the adapted 25 PA Code § 73.15 percolation test in Appendix G), as follows:

Permeability Range[1] **(inches per hour)**	**Thickness Factor**
6.0 to 12.0	0.8
2.0 to 6.0	1.0
1.0 to 2.0	1.4
0.75 to 1.0	1.2
0.5 to 0.75	1.0

NOTES:

If the permeability rate (as measured by the adopted 25 PA Code §73.15. percolation test in Appendix G) falls on a break between two thickness factors, the smaller thickness factor shall be used.

(2) Sites with soil permeability greater than 12.0 inches per hour or less than 0.5 inch per hour, as measured by the adapted 25 PA Code §73.15. percolation test in Appendix G, are not recommended for infiltration.

D. The design of any detention basin intended to meet the requirements of this Ordinance shall be verified by routing the design storm hydrograph through the proposed basin using the storage indication method or other methodology demonstrated to be more appropriate. For basins designed using the Rational Method technique, the design hydrograph for routing shall be either the Universal Rational Hydrograph or another Rational hydrograph that closely approximates the volume of the Universal Rational Hydrograph.

E. BMPs designed to store or infiltrate runoff and discharge to surface runoff or pipe flow shall be routed using the storage indication method.

F. BMPs designed to store or infiltrate runoff and discharge to surface runoff or pipe flow shall provide storage volume for the full WQv below the lowest outlet invert.

G. Wet detention ponds designed to have a permanent pool for the WQv shall assume that the permanent pool volume below the primary outlet is full at the beginning of design event routing for the purposes of evaluating peak outflows.

H. All above-ground stormwater detention facilities shall provide a minimum 0.5 feet of freeboard above the maximum pool elevation associated with the 2- through 100-year runoff events, or an additional ten percent of the 100-year storage volume as freeboard volume, whichever is greater. All below-ground stormwater detention and infiltration facilities shall have an additional ten percent of the 100-year storage volume available within the storage medium, as well as a minimum of 0.5 feet of freeboard. The freeboard shall be measured from the maximum pool elevation to the invert of the emergency spillway for above-ground facilities, and from the maximum pool elevation to the lowest overflow elevation for below-ground facilities. The 2- through 100-year storm events shall be controlled by the primary outlet structure. An emergency spillway for each above-ground basin shall be designed to pass the 100-year return frequency storm peak basin inflow rate with a minimum 0.5 foot freeboard measured to the top of basin. The freeboard criteria shall be met considering any off-site areas tributary to the basin as developed, as applicable. Exceptions to the freeboard requirements are as follows:

(1) Bioretention BMPs with a ponded depth less than or equal to 0.5 feet are exempt from the freeboard requirements;

(2) Small detention basins, with a ponded depth less than or equal to 1.5 feet or having a depth to the top of the berm less than or equal to 2.5 feet, may provide twenty percent additional storage volume measured from the maximum ponded depth to the invert of the emergency spillway in lieu of the above requirements. The depth of the emergency spillway must be sufficient to pass either two times the 100-year peak or the 100-year peak with 0.2’ of freeboard to the top of berm, whichever is greater; and

(3) Small infiltration basins, with a ponded depth less than or equal to 1.5 feet or having a depth to the top of the berm less than or equal to 2.5 feet, may provide twenty percent additional storage volume measured from the maximum ponded depth to the top of the berm in lieu of the above requirements. In this case, an emergency spillway is only necessary if runoff in excess of the basin volume would cause harm to downstream owners. If a spillway is necessary, it must be sufficiently sized to pass the 100-year peak inflow.

If this detention facility is considered to be a dam as per DEP Chapter 105, the design of the facility must be consistent with the Chapter 105 regulations, and may be required to pass a storm greater than the 100-year event.

I. The minimum circular orifice diameter for controlling discharge rates from detention facilities shall be three inches. Designs where a lesser size orifice would be required to fully meet release rates shall be acceptable with a three-inch orifice, provided that as much of the site runoff as practical is directed to the detention facilities. The minimum three-inch diameter does not apply to the control of the WQv.

I. Runoff calculations using the Soil-Cover-Complex method shall use the Natural Resources Conservation Service Type II 24-hour rainfall distribution. The 24-hour rainfall depths for the various return periods to be used consistent with this Ordinance may be taken from NOAA Atlas 14, Precipitation Frequency Atlas of the United States, current volume, or the Pennsylvania Department of Transportation Drainage Manual, 2015 Edition for Region 4. The following values are taken from the Drainage Manual:

Return Period	24-Hour Rainfall Depth
1-year	2.64 inches
2-year	3.16 inches
5-year	3.91 inches
10-year	4.57 inches
25-year	5.60 inches
50-year	6.53 inches
100-year	7.63 inches

A graphical and tabular presentation of the Type II-24 hour distribution is included in Appendix C of this Ordinance;

K. Runoff calculations using the Rational Method shall use rainfall intensities consistent with appropriate times of concentration and return periods and NOAA Atlas 14, Volume 2 Version 2.1, 2004 or the Intensity-Duration-Frequency Curves as presented in Appendix C of this chapter.

L. Runoff curve numbers (CNs) to be used in the Soil-Cover-Complex Method shall be based upon the matrix presented in Appendix C of this chapter.

M. Runoff coefficients for use in the Rational Method shall be based upon the table presented in Appendix C of this chapter.

N. All time of concentration calculations shall use a segmental approach which may include one or all of the flow types below:

(1) Sheet flow (overland flow) calculations shall use either the NRCS average velocity chart (Figure 3-1, Technical Release-55, 1975) or the modified kinematic wave travel time equation (Equation 3-3, NRCS TR-55, June 1986). If using the modified kinematic wave travel time equation, the sheet flow length shall be limited to 50 feet for designs using the Rational Method and limited to 150 feet for designs using the Soil-Cover-Complex Method.

(2) Shallow concentrated flow travel times shall be determined from the watercourse slope, type of surface and the velocity from Figure 3-1 of TR-55, June 1986.

(3) Open channel flow travel times shall be determined from velocities calculated by the Manning Equation. Bank-full flows shall be used for determining velocities. Manning 'n' values shall be based on the table presented in Appendix C of this chapter.

(4) Pipe flow travel times shall be determined from velocities calculated using the Manning Equation assuming full flow and the Manning 'n' values from Appendix C of this chapter.

O. If using the Rational Method, all pre-development calculations for a given discharge direction shall be based on a common time of concentration considering both on-site and any off-site drainage areas. If using the Rational Method, all post-development calculations for a given discharge direction shall be based on a common time of concentration considering both on-site and any off-site drainage areas.

P. The Manning Equation shall be used to calculate the capacity of watercourses. Manning 'n' values used in the calculations shall be consistent with the table presented in Appendix C of this chapter or other appropriate standard engineering 'n' value resources. Pipe capacities shall be determined by methods acceptable to the Township Engineer.

Q. The DEP, Chapter 105, Rules and Regulations, apply to the construction, modification, operation

or maintenance of both existing and proposed dams, water obstructions and encroachments throughout the watershed. Criteria for design and construction of stormwater management facilities according to this chapter may differ from the criteria that are used in the permitting of dams under the Dam Safety Program.

R. When conditions exist such that a proposed detention facility may experience a tailwater effect, the basin shall be analyzed without any tailwater effect for all storm events for comparison against the required Release Rates. An additional routing of the 100-year storm with the full tailwater effect shall be performed to check that the basin has sufficient storage to contain the 100-year tributary flow and meet freeboard requirements.

§ 137-14.1. Post construction water quality criteria.

A. No Regulated Earth Disturbance Activities within the Township shall commence until approval by the Township of a Drainage Plan which demonstrates compliance with this Ordinance;

B. The Water Quality Volume (WQv) shall be captured and treated with Vegetated/Surface and/or Direct Recharge/Subsurface BMPs. The WQv shall be calculated as the difference in runoff volume from pre-development to post-development for the 24-hour, 2-year return period storm. This may be calculated using either the Soil-Cover-Complex Method or Rational Method using the 2-year rainfall depth as noted in §137-14J of this Ordinance. The effect of closed depressions on the site shall be considered in this calculation. The WQv shall be captured and treated in a manner consistent with the standards outlined in §137-14.2 of this Chapter;

C. The WQv shall be calculated for each post-development drainage direction on a site for sizing BMPs. Site areas having no impervious cover and no proposed disturbance during development may be excluded from the WQv calculations and do not require treatment;

D. The applicant shall document the bedrock type(s) present on the site from published sources. Any apparent boundaries between carbonate and non-carbonate bedrock shall be verified through more detailed site evaluations by a qualified geotechnical professional;

E. For each proposed Regulated Activity in the watershed where an applicant intends to use infiltration BMPs, the applicant shall conduct a Preliminary Site Investigation, including gathering data from published sources, a field inspection of the site, a minimum of one test pit and a minimum of two percolation tests, as outlined in Appendix G of this Ordinance. This investigation will determine depth to bedrock, depth to the seasonal high water table, soil permeability and location of special geologic features, if applicable. This investigation may be done by a certified Sewage Enforcement Officer (SEO) except that the location(s) of special geologic features shall be verified by a qualified geotechnical professional;

F. Sites where applicants intend to use infiltration BMPs must meet the following criteria:

- Depth to existing bedrock below the invert of the BMP greater than or equal to 2 feet.
- Depth to seasonal high water table below the invert of the BMP greater than or equal to 2 feet; except for infiltration of residential roof runoff where the seasonal high water table must be below the invert of the BMP.
- Soil permeability (as measured using the standards listed in Appendix C of the Pennsylvania Stormwater Best Practices Manual) greater than or equal to 0.1 inches/hour and less than or equal to 10 inches per hour.

- Setback distances or buffers as follows:

  – 100 feet from water supply wells, or 50 feet in residential development.

  – 10 feet downgradient or 100 feet upgradient from building foundations.

- 50 feet from septic system drainfields.
- 50 feet from a geologic contact with carbonate bedrock unless a Preliminary Site Investigation is done in the carbonate bedrock to show the absence of special geologic features within 50 feet of the proposed infiltration area;

G. In entirely carbonate areas, where the applicant intends to use infiltration BMPs, the Preliminary Site Investigation described in Appendix G of this Ordinance shall be conducted. For infiltration areas that appear feasible based on the Preliminary Site Investigation, the applicant shall conduct the Additional Site Investigation and Testing as outlined in Appendix G of this Ordinance. The soil depth, percolation rate and proposed loading rate, each weighted as described in §137-14J of this Chapter, along with the buffer from special geologic features shall be compared to the Recommendation Chart for Infiltration Stormwater Management BMPs in Carbonate Bedrock in Appendix D of this Ordinance to determine if the site is recommended for infiltration. In addition to the recommendation from Appendix D of this Ordinance, the conditions listed in §137-14.1(F) of this Ordinance are required for infiltration in carbonate areas;

H. Site areas proposed for infiltration shall be protected from disturbance and compaction except as necessary for construction of infiltration BMPs;

I. If infiltration of the entire WQv is not proposed, the remainder of the WQv shall be treated by acceptable BMPs for each discharge location. Acceptable BMPs are listed in Appendix H of this Ordinance;

J. Stormwater runoff from Hot Spot land uses shall be pre-treated. Suggested methods of pre-treatment are listed in Appendix H of this Ordinance;

K. The use of infiltration BMPs is prohibited on Hot Spot land use areas unless the applicant can demonstrate that existing and proposed site conditions, including any proposed runoff pre-treatment, create conditions suitable for runoff infiltration under this Ordinance;

L. Stormwater infiltration BMPs shall not be placed in or on a special geologic feature(s). Additionally, stormwater runoff shall not be discharged into existing on-site sinkholes;

M. Stormwater drainage wells may only be used for runoff from roof areas;

N. Applicants shall request, in writing, Public Water Suppliers to provide the Zone I Wellhead Protection radius, as calculated by the method outlined in the Pennsylvania Department of Environmental Protection Wellhead Protection regulations, for any public water supply well within 400 feet of the site. In addition to the setback distances specified in §152-9.1(F) of this Ordinance, infiltration is prohibited in the Zone I radius as defined and substantiated by the Public Water Supplier in writing. If the applicant does not receive a response from the Public Water Supplier, the Zone I radius is assumed to be 100 feet; and

O. The municipality may, after consultation with DEP, approve alternative methods for meeting the State Water Quality Requirements other than those in this Ordinance, provided that they meet the minimum requirements of, and do not conflict with, State law including but not limited to the Clean Streams Law.

§ 137-14.2. Green infrastructure and existing water balance preservation standards.

A. The entire WQv as calculated in §152-9.1(B) of this Chapter shall be captured and treated by either Direct Recharge/Subsurface and/or Vegetated/Surface BMPs;

B. As much proposed impervious area as practical shall be directed to water quality BMPs;

C. Existing impervious area that is not proposed to be treated by Direct Recharge/Subsurface BMPs should be excluded from all water balance calculations;

D. Vegetated/Surface BMPs shall be employed "first" for the site to capture the equivalent of a minimum of 0.38 inches of runoff for each square foot of impervious area, unless proven not feasible by the applicant. For proposed impervious cover directed to multiple BMPs, the Vegetated/Surface BMP capture volume chart in Appendix C shall be used to determine overall site compliance. Direct Recharge/Subsurface BMPs may be used "first" for portions of the impervious cover provided the overall Vegetated/Surface BMP "first" standard is met;

E. A maximum of 30% of the total annual rainfall for a site may be directly recharged to groundwater using Direct Recharge/Subsurface BMPs, for runoff from impervious areas.

(1) For development sites with greater than 33% proposed impervious cover:

(a) If all impervious cover is directed to Vegetated/Surface BMPs to capture the entire 2-year, 24-hour event, the Direct Recharge standard is met;

(b) up to 33% of the site as impervious cover may be directed to Direct Recharge/Subsurface BMPs designed to capture the entire 2-year, 24-hour event provided the overall Vegetated/Surface BMP "first" standard is met. All remaining impervious cover shall be directed to Vegetated/Surface BMPs designed to capture the remainder of the WQv; and

(c) For Vegetated/Surface and/or Direct Recharge/Subsurface BMPs designed for runoff from impervious areas designed to capture less than the entire 2-year, 24-hour event, Appendix C shall be used to assure that the maximum Direct Recharge standard is met.

(2) The maximum 30% Direct Recharge standard applies on an overall site basis, rather than in each drainage direction.

§ 137-15. Retained for future use.

§ 137-16. Retained for future use.

§ 137-17. Stormwater infiltration.

A. Infiltration practices shall be designed and constructed in accordance with the standards in Appendix A.

B. All stormwater runoff from residential (principal and accessory) structures which have a cumulative square footage of 1,200 square feet or greater shall be infiltrated in an infiltration practice with a void volume equal to three inches over the impervious surface, with a minimum cover of one foot, and which has a footprint area of at least 1/5 the size of the proposed impervious area. Probes shall be performed to determine the required vertical separations from limiting zones; however, no percolation testing is required. Where geologic or soil evaluations do not support infiltration, the stormwater flow rate shall be regulated so as to not exceed 0.25 cubic

foot per second greater than predevelopment rates during the two-, ten-, twenty-five-, and one-hundred-year storms.

§ 137-18. Detention basins.

Detention facilities shall be permitted only where the geology of the tract being developed precludes the use of infiltration volume control and only to the extent that geology precludes infiltration, or as may be allowed by the Township only where unique physical circumstances of the development property exist. Permission to use detention facilities shall not be granted for economic reasons. Where the Township allows detention facilities, such detention facilities shall be designed in accordance with the following requirements:

A. The detention facilities shall be designed to retard stormwater runoff rates after development to the peak runoff rate established by this chapter.

B. Detention facility spillways shall be protected from erosion.

C. Detention facility pipe outlet arrangements shall provide complete outletting of all detained water, unless provisions for permanent ponding have been approved by the Township Council. Basin forebay infiltration areas may be allowed on a case-by-case basis if it is deemed the most suitable BMP applicable to the site.

D. Detention pond lining and carbonate geology requirements.

(1) A detention facility, if utilized, shall be lined with an impervious lining in areas of carbonate geology. This liner shall be constructed to meet the following minimum requirements:

(a) The minimum liner required is 30 mil PVC and must be UV resistant. Actual individual liner specifications shall be provided by the manufacturer for each individual facility.

(b) The liner must be placed on a layer of fine-grained soil that has been rolled with a smooth drum roller in both directions to produce a smooth level base for the liner. The soil may not contain sharp angular rock or other debris that could puncture the liner, and must meet all manufacturers' specifications for a liner bedding. All vegetation, roots and grass must be removed and any cracks or voids shall be filled.

(c) If rock is encountered in the bedding area, this rock must be excavated to a depth of six inches below the liner and backfilled with a fine-grained soil. This area should then be covered with geotextile fabric extending three feet beyond the limits of the rock outcrop before placing the facility liner.

(d) Installation of the liner may only take place when the ambient temperature is within the manufacturer's specifications. The number of field seams shall be minimized by requiring factory fabrication of large panels. Any field seams performed must be in accordance with the manufacturer's specifications.

(e) All structures (i.e., headwalls, pipes, outlet structures) which come in contact with the liner must have a waterproof seal installed to prevent leaks around the structure. These seals shall be installed per manufacturer's recommendations.

(f) A minimum of 12 inches of earth cover shall be placed over the lining. Soil containing sharp jagged rocks, roots, debris or any other material that may puncture the liner shall not be used as cover material

(g) The liner must be installed to a minimum height of the one-hundred-year floodwater elevation in the facility

(2) If a detention facility is proposed without lining, the developer's engineer/surveyor must sign and seal the following note which shall be attached to all drainage plans, subdivision plans, and land development plans: "I, [*name*], certify that the proposed facility(ies) is/are not underlain by carbonate geology."

(3) Basins shall not be placed where prohibited by the carbonate geology area requirements of Chapter **180**, Zoning, of the Code of the Township of Lower Saucon.

E. The minimum circular orifice diameter for controlling discharge rates from detention facilities shall be three inches. Designs where a lesser size orifice would be required to fully meet release rates shall be acceptable with a three-inch orifice provided that as much of the site runoff as practical is directed to the detention facilities.

F. The detention facility shall be planted with wet-tolerant, wildflower or low-maintenance grass satisfactory to the Township. Detention basins shall be planted with ground cover in accordance with Township standards.

G. An access ramp of 10 to 1, 10 feet wide, shall be provided to allow maintenance equipment to reach the basin floor.

H. Where allowed by waiver of Council, fencing for detention basins shall provide a suitable barrier, at least four feet in height, of material approved by the Township, such as 0.4 retention pressure-treated wooden post-and-rail fence (three-rail) with black vinyl-coated metal hardware fabric. Access to the basin shall be provided by a locking gate or gates, having a total opening of at least 10 feet, at such a location as to provide ready access to the detention basin by maintenance forces with maintenance equipment or suitable equivalent approved by the Township during the plan review. The fence shall be at least three feet from the inside edge of the berm (or top of slope) or five feet from the outside top of the berm.

I. Landscaping, subject to approval of the Township, shall be provided adjacent to the detention facility so as to provide a buffer between the facility and the adjacent development. If a fence is required, the detention basin fence shall be screened in accordance with improvements construction standards, as outlined in SALDO.

J. Where no fence is included, detention basin berms shall have a minimum width of six feet.

K. In all cases, the outside slope of a berm shall not be steeper than a ratio of 3:1, horizontal to vertical.

L. To minimize the visual impact of detention basins, basins shall be designed to avoid the need for safety fencing. To meet this requirement, basins shall be designed to the following specifications:

(1) The maximum depth of detained runoff shall be 24 inches for a two-year or ten-year storm event.

(2) The maximum depth of detained runoff shall be 36 inches for a one-hundred-year storm event.

(3) Interior slopes shall not be steeper then a ratio of 5 to 1 horizontal to vertical.

(4) The basin shall never exceed a depth of 24 inches for more than four hours.

(5) Basins shall drain completely within eight hours of the end of the rainfall.

(6) These depths and slopes may be exceeded by permission of the Township on a case-by-case basis for detention basin areas having a natural slope greater than 5% and/or having substantial woodland ground cover. In such a case, fence and landscape screens will be required. These requirements shall not be waived for economic reasons.

M. If fencing is allowed by waiver of Council, and a basin is proposed to be dedicated to the Township, the basin design shall provide a level area (two-percent slope), 12 feet in width, on both the inside and outside of the fence, along the entire length of the fence for proper access by Township maintenance equipment. The total width of this generally level area shall be at least 24 feet.

N. The minimum slope of the bottom of a detention facility shall be 1% toward the outlet structure, except for approved BMP areas.

O. All stormwater detention facilities shall provide a minimum 1.0 foot freeboard above the maximum pool elevation associated with the two-year through twenty-five-year runoff events. A 0.5 foot freeboard shall be provided above the maximum pool elevation of the one-hundred-year runoff event. The freeboard shall be measured from the maximum pool elevation to the elevation of the emergency spillway. The two-year through one-hundred-year storm events shall be controlled by the primary outlet structure. An emergency spillway for each basin shall be designed to pass the one-hundred-year return frequency storm peak basin inflow rate, as if the basin were full prior to the storm, with a minimum 0.5 foot freeboard measured to the top of basin. The freeboard criteria shall be met considering any off-site areas tributary to the basin as developed, as applicable. If this detention facility is considered to be a dam as per DEP Chapter 105, the design of the facility must be consistent with the Chapter 105 regulations, and may be required to pass a storm greater than the one-hundred-year event.

P. The detention basin one-hundred-year water storage surface elevation perimeter shall be shown on all plans. Principal residential structures shall be set back 100 feet from any detention basin one-hundred-year water storage surface elevation perimeter. Where this setback is more restrictive than the zoning setback, the new setback line shall be shown on the plan with a dimension to the one-hundred-year water storage surface elevation perimeter provided. Accessory residential structures and all nonresidential structures shall be set back 25 feet from any detention basin one-hundred-year water storage surface elevation perimeter.

Q. Soils used for the construction of basins shall have low-erodability factors ("K" factors).

R. All detention facility outflows, including emergency spillways, shall comply with §§ 137-11F, 137-19D and 137-23K.

S. The top of slope or toe of outside slope of any detention or retention basin shall be no closer than 50 feet from any property line, or ultimate right-of-way line.

§ 137-19. Collection systems.

A. Fixed pipe collection system. The Township may require a fixed pipe collection system with inlets. Such fixed pipe collection system with inlets shall be used in all areas with street curbs and gutters, when required.

B. Low-point drainage. The developer shall grade and install all necessary stormwater management facilities to ensure the drainage of all low points on subdivided lots or within the subdivision or developed land areas (except in areas of protected lakes, ponds, or wetlands, vernal ponds and in approved infiltration practices). Underdrains are required at a minimum of 50 feet upward from a road low point along each side of each approach road to the low point.

C. Street drainage. All streets shall be designed so as to provide for the discharge of surface water from their rights-of-way. Concentrated discharges of stormwater from rights-of-way shall be directed to an acceptable watercourse, pipe, culvert or swale.

D. Stormwater discharge.

(1) Concentrated stormwater runoff to downstream properties, including piped storm sewer system outlets, detention facility discharge structures and swales shall discharge into an adequately sized watercourse or storm sewer system after meeting all required release rate criteria. (See also § 137-23K.) If a level spreader is incorporated within the design of the outlet system, the postdevelopment peak rate of discharge across the width of the level spreader shall not exceed the predevelopment peak flow across the same width at the same location. Level spreaders shall be located a minimum of 100 feet from the downstream limit of any drainage easement boundary under the control of the developer and no closer than 100 feet to an existing or ultimate public road right-of-way.

(2) Level spreaders shall be designed to remain level and to resist frost-related movement.

E. Capacity for design storms:

(1) Unless a more conservative design is required by another regulation or is required because of conditions particular to an individual development, the following storm criteria shall be used to design storm collection and conveyance systems:

Area	Design Storm Return (years)
Residential areas	
Fixed pipe	10
Total conveyance	100
Nonresidential areas	
Fixed pipe	25
Total conveyance	100
Culvert crossings of any road	
In culvert	25
Total conveyance	100

(2) Adequate overland conveyance of the one-hundred-year storm must be provided to any detention basin or other stormwater management facility designed to manage runoff from the one-hundred-year storm assuming all stormwater inlets are clogged. Conveyance of the one-hundred-year storm to infiltration practices must be assured.

F. Open swales and gutters. Open swales shall be designed on the basis of Manning Formula, as indicated for collection systems, with the following considerations:

(1) Roughness coefficient. The roughness coefficient shall be 0.040 for vegetated swales.

(2) Bank slopes. Slopes for swale banks shall not be steeper than one vertical for three horizontal.

(3) Flow velocity. Design velocity in grass or vegetated swales shall not exceed four feet per second.

(4) Swale right-of-way and easement width. Swale right-of-way or easements shall be sufficiently wide to include a ten-foot access strip in addition to the width of the swale from the bank top. The Township may, under unusual conditions, require a wider swale right-of-way.

(5) Swales adjacent to road paving which meet the Township standards for roadside swales shall be permitted to carry a maximum flow of five cubic feet per second for the ten-year design storm return in residential areas and the twenty-five-year design storm return in nonresidential area prior to discharge away from the street surface, unless it is proven to the satisfaction of the Township by engineering calculations that the road slopes or other factors would allow higher swale capacity. Gutter flow along a curb shall not be permitted to exceed 1/2 of a travel lane in width, for the twenty-five-year design storm return.

(6) Flows larger than those permitted in gutters and roadside swales may be carried in swales outside the required road right-of-way in separate drainage easements or may be carried in pipes or culverts inside or outside the required road right-of-way.

(7) Swales shall be stabilized with vegetation or other materials approved by the Township to prevent erosion.

(8) Paved swales are not permitted.

G. Fixed pipe collection system standards. Culverts, drainage structures and other parts of the stormwater drainage system that are not open swales or gutters shall be designed on the basis of Manning Formula, as indicated for collection systems, with the following considerations:

(1) Inlets. Curb inlets shall be located at curb tangents on the uphill side of street intersections. The design and location of curb inlets shall be approved by the Township. The collection capacity of curbed inlets is to be determined using PennDOT standard efficiency charts for the capture capacity of Type C inlets.

(a) Gutter flows shall not be permitted across street intersections.

(b) All inlets shall be labeled with an embedded plastic disk indicating a prohibition against pollutants.

(2) State approvals. Drainage structures that are located on state highway rights-of-way shall be approved by the Pennsylvania Department of Transportation, and a copy of the highway occupancy permit shall be submitted to the Township.

(3) Pipe materials. Existing storm piping shall be extended using the same pipe materials to the next connected stormwater structure. Otherwise, all storm piping shall be new Class III reinforced concrete piping with O-ring joints, or smooth-lined HDPE pipe, with watertight joints. All storm piping shall meet all requirements of PennDOT. Piping shall be saw cut at the ends, as needed, and not hammered or broken.

(4) Minimum pipe size. Minimum pipe size shall be 15 inches.

(5) Minimum pipe slope. The minimum pipe slope shall be 0.5%.

(6) Minimum ground cover. The minimum cover shall be 12 inches from finished grade to the top of the pipe. A minimum cover shall be 18 inches from the top of the cartway to the top of the pipe.

(7) Maximum pipe length. Storm sewer piping shall have a maximum length of 300 feet between junction boxes, manholes or inlets which would allow access and cleaning from the surface of the ground.

(8) Inlet and manhole construction. Inlet and manhole castings and concrete construction shall be equivalent to Pennsylvania Department of Transportation design standards. A cover of at least four inches shall be provided above any pipe in any proposed concrete structure which is subject to vehicular traffic.

(9) Roof drainage. Stormwater roof drains and pipes shall not discharge water over impervious areas.

(10) Open-end pipes must be fitted with concrete end walls or wing walls in accordance with PennDOT standards. Flared end sections are not permitted. In addition, all end walls, wing walls and detention facility outlet control structures shall be provided with a concrete footings that extend below the frost line for scour and frost protection. This concrete footing shall be a minimum depth of 30 inches below ground level.

(11) Upstream open culvert headwalls or wing walls for pipes shall be fitted with slanted durable protective grates.

(12) No end of a storm sewer pipe shall be permitted inside the ultimate road right-of-way. An exception to this requirement is in cases where new driveways must cross existing deep roadside swales adjacent to existing roads. In the case of this exception to the standard, the pipe shall be located as far off the edge of pavement as possible (at least 16 feet from the road center line) and shall be adequately sized by a professional engineer per this chapter.

(13) Flow velocity. Storm drains shall be designed to produce a minimum velocity of 3.0 feet per second when flowing full. The maximum permissible velocity shall be 15.0 feet per second.

(14) Fixed pipe conveyance of stormwater must be to the same destination (detention basin, off-site point of study, etc.) as stormwater would be conveyed overland if the fixed pipe conveyance system were to fail.

(15) All concentrated stormwater discharge directed toward public right-of-way shall be captured into the fixed pipe collection system.

(16) Inlets and manholes shall be spaced at intervals not exceeding 300 feet and shall be located wherever branches are connected or sizes are changed and wherever there is a change in alignment or grade.

(17) Inlets shall have sufficient capacity to accept design flows.

(18) Carbonate geology. In areas of carbonate bedrock and in carbonate geologic areas as defined in Chapter 180, Zoning, of the Code of the Township of Lower Saucon, mortar joint and metal-banded sewer piping is prohibited.

(19) Storm drainage system discharges shall not be directed toward any of the carbonate features.

(20) All nonsumped structures shall have its lowest invert out at least 0.1 foot lower than its lowest invert in. All sumped structures shall have its lowest invert "out" at least as high as the highest invert "in" unless an oil/water separator is utilized.

H. Bridges and culverts. Bridges and culverts shall be designed to support expected loads, to carry expected flows and to be constructed to the full width of the right-of-way. Such bridges or culverts shall be designed in accordance with Pennsylvania Department of Transportation construction standards. Separate design plans and specifications shall be required for each bridge and culvert, which plans and specifications shall be subject to review and approval of the Township.

I. Design conditions. All storm drainage systems shall be designed in accordance with PennDOT Design Manual 2 Chapter 10 requirements. For storm drainage systems which are not proposed within PennDOT right-of-way, an exception shall apply such that any requirement contained in a Township chapter shall supersede any directly conflicting requirement of PennDOT Design Manual 2 Chapter 10.

J. Flood protection. All storm drainage calculations for facility sizing and for flood conveyance and flood protection shall be provided using the assumption that the contributing undeveloped upstream watershed is developed in conformance with regulations of the current Chapter 180, Zoning.

§ 137-20. Permanent erosion and sediment control.

A. Special structures, such as check dams, drop outlets or other energy-dissipating structures or riprap may be required to prevent scour or erosion in locations with large runoff quantities or steep slopes. In no case may a change be made in the existing topography which would result in a slope exceeding the normal angle of slippage of the material involved. No paved swales will be allowed without the approval of the Township.

B. Energy dissipaters shall be placed at the outlets of all pipes.

C. Erosion and sedimentation control measures shall be in accordance with the applicable state and county standards and specifications.

§ 137-21. Erosion and sediment control during regulated earth disturbance activities.

A. No regulated earth disturbance activities within the Township shall commence until approval by the Township of an erosion and sediment control plan for construction activities. Written approval by DEP or a delegated county conservation district shall satisfy this requirement.

B. An erosion and sediment control plan is required by DEP regulations for any earth disturbance activity under Pa. Code § 102.4(b).

C. A DEP NPDES stormwater discharges associated with construction activities permit is required for regulated earth disturbance activities under Pa. Code Chapter 92.

D. Evidence of any necessary permit(s) for regulated earth disturbance activities from the appropriate

DEP regional office or county conservation district must be provided to the Township before the commencement of an earth disturbance activity.

E. A copy of the erosion and sediment control plan and any permit, as required by DEP regulations, shall be available at the project site at all times.

F. All construction shall be done in accordance with the approved erosion and sedimentation control plan.

§ 137-22. Permit requirements by other government entities.

A. The following permit requirements apply to certain regulated and earth disturbance activities and must be met prior to commencement of regulated and earth disturbance activities, as applicable:

(1) All regulated and earth disturbance activities subject to permit requirements by DEP under regulations at 25 Pa. Code Chapter 102.

(2) Work within natural drainageways subject to permit by DEP under 25 Pa. Code Chapter 102 and Chapter 105.

(3) Any stormwater management facility that would be located in or adjacent to surface waters of the commonwealth, including wetlands, subject to permit by DEP under 25 Pa. Code Chapter 105.

(4) Any stormwater management facility that would be located on a state highway right-of-way or require access from a state highway or discharge onto a state highway right-of-way shall be subject to approval by the Pennsylvania Department of Transportation (PennDOT).

(5) Culverts, bridges, storm sewers or any other facilities which must pass or convey flows from the tributary area and any facility which may constitute a dam subject to permit by DEP under 25 Pa. Code Chapter 105.

B. All plans with all supporting calculations submitted to government agency for review to receive permits shall have substantially the same design as the drainage plan submitted for review by the Township; a copy of all plans, with supporting calculations, which have received a government agency permit, shall be provided to the Township and Township Engineer.

§ 137-23. Additional design requirements.

A. All stormwater management facilities proposed shall be designed in accordance with Chapter **145**, Subdivision and Land Development, of the Code of Lower Saucon Township, and the general design and construction standards of this chapter.

B. Lots shall be graded to secure proper drainage away from buildings and, to the extent possible, away from street areas, except streets where curbs, storm sewer piping system or roadside swales exist.

C. (Reserved)

D. The developer shall construct and/or install such drainage structures and/or pipes which are necessary to prevent erosion damage and to satisfactorily manage surface waters in accordance with Title 25, Rules and Regulations, Part I, Commonwealth of Pennsylvania Department of Environmental Protection, Subpart C, Protection of Natural Resources, Article **II**, Water Resources, Chapter 102, Erosion Control. Any drainage system not operating as planned or which

causes downstream damage shall be corrected at the expense of the developer.

E. No person, firm, or corporation shall modify, fill, excavate or regrade the land in any manner as to endanger or damage any adjoining public street, sidewalk, alley or any other public or private property without supporting and protecting such property from settling, cracking, erosion, sediment, stormwater ponding (except in those cases where ponding is approved) or other physical damage or personal injury which might result. Such activity without the required support or protection will constitute a nuisance punishable by the provisions of this chapter.

F. No person, firm or corporation shall deposit or place any debris or other material whatsoever, or cause such to be thrown or placed, in any drainage ditch or drainage structure in such a manner as to reduce the ability of the stormwater management facility to operate.

G. Stockpiling of topsoil shall be protected from erosion.

H. All disturbed areas shall be seeded, sodded and/or planted or otherwise protected from erosion within 60 days of ground breaking, and shall be watered, tendered and maintained until growth is well established. If state regulations require a shorter time, the shorter time shall be required

I. All permanent grading shall be designed and undertaken to meet the following criteria:

(1) Provide positive surface drainage away from on-site sewage disposal systems; and

(2) Provide positive surface drainage away from buildings and structures; and

(3) Provide that no cutting or filling, either temporarily or permanently, shall be allowed to occur within two feet of any side or rear property line, except at locations where specific grading and/or drainage easements exist for the purposes of such grading.

J. The developer shall limit stormwater runoff rate and concentration from the subject lot to other lands in a manner that will minimize risk of damage to downstream property owners.

K. Stormwater discharge facilities outletting water to the surface of the ground shall be designed and constructed to meet the following criteria in addition to other regulations:

(1) Stormwater roof drains and any sump pump drains shall not discharge water directly onto a sidewalk, a lane, or a street, or within the street, or within the street right-of-way and shall not direct water toward improved portions of adjacent lots (i.e., buildings, driveways, on-lot sewer facilities, etc.).

(2) Stormwater roof drains and sump pump drains shall be constructed to disperse the discharge on the lot which is the subject of the application or to an approved stormwater system.

(3) Any stormwater outlet pipe (including detention basin outlet pipe) or structure (including detention basin spillway) that discharges water to the surface of the ground shall be located no closer than 100 feet from an adjacent property line or right-of-way line and shall discharge into a drainage channel, swale or pipe within a drainage easement that has been designed, constructed and/or analyzed to receive the water discharge from that outlet. Emergency overflow pipes from sub-surface infiltration facilities may be located within 20 feet of a property or right of way line if the pipe is designed to provide for emergency relief only. Downspout pipes discharging stormwater runoff from portions of a roof of less than 500 square feet of roof area shall be exempt from this regulation if the following criteria are met:

(a) The outlet shall be located no closer than five feet from a property line; and

(b) A standard splash pad or apron shall be provided to spread the flow; and

(c) A swale or ground slope shall be provided or available to protect the immediate adjacent downstream property.

(4) If a stormwater outlet pipe discharges in the direction of a public right-of-way, the alignment of that discharging stormwater shall be within an angle of 20° or less to a line parallel to the roadside swale or gutter, unless inlet facilities are provided to relieve that flow.

L. All persons, firms or corporations shall adequately operate, maintain, repair, restore and/or replace (if necessary) any stormwater management facility on its premises to keep them in good operating condition. For example, all watercourses, drainage ditches, culverts, drainpipes, infiltration facilities, detention basins and structures shall be kept open and operating at all times.

M. No ground may be proposed or altered to exceed a slope steeper than 1 vertical for 3 horizontal.

ARTICLE IV
Drainage Plans

§ 137-24. General requirements.

For any of the regulated activities of this chapter, prior to the final approval of subdivision and/or land development plans, or the issuance of any permit, or the commencement of any regulated earth disturbance activity, the owner, subdivider, developer or his agent shall submit a drainage plan and receive Township approval of the plan.

The plan shall be prepared by an engineer registered in the Commonwealth of Pennsylvania, except such plan may be prepared by a surveyor registered in the Commonwealth of Pennsylvania (if permitted by law).

§ 137-25. Exemptions.

Exemptions from the drainage plan requirements are as specified in § 137-6.

§ 137-26. Drainage plan contents.

A. General.

(1) General description of project.

(2) General description of proposed permanent stormwater controls.

(3) The name and address of the project site, the name and address of the owner of the property and the name of the individual or firm preparing the drainage plan.

B. Map(s) of the project area showing:

(1) The location of the project relative to highways, municipalities or other identifiable landmarks.

(2) Existing contours at intervals of two feet. In areas of steep slopes (greater than 15%), five-foot contour intervals may be used. Off-site drainage areas impacting the project including topographic detail.

(3) Streams, lakes, ponds or other bodies of water within the project area.

(4) Other features including flood hazard boundaries, existing drainage swales, wetlands, closed depressions, vernal ponds, sinkholes, rock outcrops, cliffs and areas of natural vegetation to be preserved.

(5) Locations of proposed underground utilities, sewers and water lines. The locations of all existing and proposed utilities, sanitary sewers and water lines within 50 feet of property lines of the project site.

(6) An overlay showing soil types and boundaries based on the Northampton County Soil Survey, latest edition. Any hydric soils present on the site should be identified as such.

(7) An overlay showing geologic types, boundaries and any special geologic features present on the site.

(8) Proposed changes to land surface and vegetative cover.

(9) Proposed structures, roads, paved areas and buildings.

(10) Final contours at intervals of two feet. In areas of steep slopes (greater than 15%), five-foot contour intervals may be used.

(11) Stormwater Management District boundaries applicable to the site.

(12) Clear identification of the location and nature of permanent stormwater BMPs.

(13) An adequate access area around all stormwater BMPs that would provide equipment ingress to and egress from a public right-of-way.

(14) A schematic showing all tributaries contributing flow to the site and all existing man-made features beyond the property boundary that would be affected by the project.

(15) The location of all public water supply wells within 400 feet of the project and all private water supply wells within 100 feet of the project.

(16) Fencing (if required) and landscaping screens.

(17) Existing and proposed on-lot sewage disposal facilities and backup areas to be preserved for replacement on-lot sewage disposal facilities (if applicable).

(18) A tabulation of impervious cover and type (building, driveway, etc.) and identify if impervious cover is controlled by stormwater management:

(a) Existing prior to May 20, 1998.

(b) Existing since May 20, 1998.

(c) Existing since January 17, 2007.

(d) Proposed new.

(19) A listing of impervious cover allowed for each lot based on zoning and the cover assumptions in the storm water management calculations.

C. Stormwater management controls and BMPs.

(1) All stormwater management controls and BMPs shall be shown on a map and described, including:

(a) Groundwater recharge methods such as seepage pits, beds or trenches.

(b) Other stormwater control devices or methods such as rooftop storage,

semipervious paving materials, grass swales, parking lot ponding, vegetated strips, detention or retention facilities, storm sewers, etc.

(2) All calculations, assumptions and criteria used in the design of the stormwater management facilities and BMPs shall be shown.

(3) All site testing data used to determine the feasibility of infiltration on a site.

(4) All details and specifications for the construction of the stormwater management control and BMPs.

(5) Staging or implementation schedule for constructing the proposed stormwater control system.

D. The BMP operations and management plan, as required in Article VII, describing how each permanent stormwater BMP will be operated and maintained and the identity of the person(s) responsible for operations and maintenance. A statement must be included, signed by the owner, acknowledging that the stormwater BMPs are fixtures that cannot be altered or removed without approval by the Township.

E. For the subdivision and land development maintenance program, a separate document outlining the maintenance program for all stormwater management control facilities must be included. This program must include the proposed ownership of the control facilities, the maintenance requirements for the facilities and the financial responsibilities for the required maintenance. Prior to final plan approval and recording, the owner's responsibility for facility ownership, maintenance, repair and replacement described in this plan or program shall be described in a legal agreement between the owner and the Township. Such legal agreement shall be prepared to the satisfaction of the Township Solicitor. Such agreement shall be binding on the owner and future owners and shall be recorded so as to become a covenant running with the land.

F. Environmental resources site design assessment.

(1) An environmental resources site design assessment that describes the following:

(a) The extent to which the proposed grading and impervious cover avoid disturbance of significant environmental resources and preserve existing site hydrology.

(b) An assessment of whether alternative grading and impervious cover site design could lessen the disturbance of significant environmental resources and/or make better use of the site hydrologic resources.

(c) A description of how the proposed stormwater management controls and BMPs serve to mitigate any adverse impacts on environmental resources on the site.

(2) Significant environmental resources considered in the site design assessment include, but are not limited to, steep slopes, ponds, lakes, streams, wetlands, vernal ponds, hydric soils, floodplains, riparian vegetation, native vegetation and special geologic features.

§ 137-27. Plan submission.

A. For regulated activities specified in §137-5B(1) and (2):

(1) The drainage plan shall be submitted by the developer to the Township Secretary-Treasurer as part of the preliminary plan application (or final plan application or earth-moving permit application if no preliminary plan submission is made) submission for the subdivision or land development.

(2) Seven copies of the drainage plan and supporting documents shall be submitted. All copies shall be signed and sealed by the registered engineer and/or surveyor that prepared the plan and calculations.

(3) Distribution of the drainage plan will be as per the requirements of Chapter **145**, Subdivision and Land Development.

(4) Drainage Plans involving more than 10,000 square feet of additional impervious cover shall be submitted by the developer to the Township and to the LVPC as part of the Preliminary Plan submission. The LVPC will conduct an advisory review of the Drainage Plan for consistency with the Model Watershed Stormwater Management Plan. The LVPC will not review details of the Erosion and Sedimentation Plan or the BMP Operations and Maintenance Plan;

(a) Two (2) copies of the Drainage Plan shall be submitted and

(b) The LVPC will provide written comments to the developer and the Township, within a time frame consistent with established procedures under the Municipalities Planning Code, as to whether the Drainage Plan has been found to be consistent with the Stormwater Management Plan.

B. For regulated activities specified in §137-5B(3) and (4), the drainage plan shall be submitted by the developer to the Township Zoning Administrator as part of the building permit application or to the Township Secretary-Treasurer as part of the required site plan (Chapter 180) as appropriate.

C. For Regulated Activities specified in §137-B(5), (6), (7) and (8) of this Chapter:

(1) The Drainage Plan shall be submitted by the developer to the Lehigh Valley Planning Commission for coordination with the DEP permit application process, as needed, under Chapter 105 (Dam Safety and Waterway Management), Chapter 106 (Flood Plain Management) of DEP's Rules and Regulations and the NPDES regulations and

(2) One (1) copy of the Drainage Plan shall be submitted.

D. Earthmoving for all Regulated Activities under §137-5 of this Ordinance shall be conducted in accordance with the current Federal and State regulations relative to the NPDES and DEP Chapter 102 regulations.

§ 137-28. Drainage plan review.

A. The Township Engineer shall review the drainage plan, including the BMP operations and maintenance plan, for consistency with this chapter, any permits issued by DEP, and any additional provisions in Chapter 145, Subdivision and Land Development, as applicable.

B. The Lehigh Valley Planning Commission shall provide an advisory review of the drainage plan for consistency with the Lehigh Valley Planning Commission Model Stormwater Management Plans.

C. For regulated activities specified in this chapter, the Lehigh Valley Planning Commission shall provide written comments to the Township, within a time frame consistent with established procedures under the Municipalities Planning Code, as amended, as to whether the drainage plan has been found to be consistent with the stormwater management plan.

D. For DEP-regulated activities, the Lehigh Valley Planning Commission shall notify the DEP whether the drainage plan is consistent with the stormwater management plan and forward a copy of the review letter to the Township and developer.

E. The Township shall not approve any subdivision or land development or building permit application if the drainage plan has been found to be inconsistent with the stormwater management plan as determined by the Township Engineer.

F. The Township shall require an as-built survey of all stormwater BMPs and an explanation of any discrepancies with the drainage plan prior to issuance of a certificate of occupancy or prior to release of developer improvement security, if applicable.

§ 137-29. Modification of plans.

A modification to a submitted drainage plan for a proposed development site which involves a change in control methods or techniques, or which involves the relocation or redesign of control measures, or which is necessary because soil or other conditions are not as stated on the drainage plan (as determined by the Township Engineer) shall require a resubmission of the modified drainage plan consistent with and subject to review per the provisions of this chapter.

§ 137-30. Hardship waiver procedure.

A. The Township Council may hear requests for waivers where it is alleged that the provisions of this chapter inflict unnecessary hardship upon the owner. For all regulated activities, the Council of Lower Saucon shall hear requests for and decide on hardship waiver requests on behalf of the Township. The waiver request shall be in writing and accompanied by the requisite fee based upon a fee schedule adopted by the Township. A copy of the waiver request shall be provided to each of the following: Township, Township Engineer and Township Solicitor. The request shall fully document the nature of the alleged hardship and address, at a minimum, the requirements listed below:

(1) That there are unique physical circumstances or conditions, including irregularity of lot size or shape, or exceptional topographical or other physical conditions peculiar to the particular property, and that the unnecessary hardship is due to such conditions, and not the circumstances or conditions generally created by the provisions of this chapter in the Stormwater Management District in which the property is located;

(2) That because of such physical circumstances or conditions, there is no possibility that the property can be developed in strict conformity with the provisions of this chapter, including the no harm provisions, and that the authorization of a waiver is therefore necessary to enable the reasonable use of the property;

(3) That such unnecessary hardship has not been created by the owner;

(4) That the waiver, if authorized, will represent the minimum waiver that will afford relief and will represent the least modification possible of the regulation in issue; and

(5) That financial hardship is not the criteria for granting of a hardship waiver.

B. In granting any waiver, the Township Council may attach such conditions and safeguards as it may deem necessary to implement the purposes of Act 167 and this chapter. If a hardship waiver is granted, the owner must still manage the quantity, rate, velocity, direction and quality of resulting storm runoff as is necessary to prevent injury to health, safety or other property.

C. No waivers may be granted by Council for any provisions of this Ordinance which may be covered under any required NPDES permit without prior approval from DEP.

ARTICLE V
Inspections

§ 137-31. Schedule of inspections

A. DEP or its designees (e.g., County Conservation District) normally ensure compliance with any DEP permits issued, including those for stormwater management. In addition to DEP compliance programs, the Township or its designee may inspect all phases of the construction, operations, maintenance, repair and/or replacement of stormwater facilities including BMPs.

B. During any stage of the regulated earth disturbance activities, if the Township or its designee determines that any portion of the storm drainage system is not being constructed or operated in accordance with this chapter, the Township may suspend or revoke any existing permits issued by the Township or other approvals issued by the Township until the deficiencies are corrected.

C. For all regulated earth disturbance activities, the qualified professional shall certify that all permanent storm water management BMP's have been constructed according to the approved plans and specifications.

D. As-built plans of all storm water management BMP's shall be submitted to the Township along with an explanation of any discrepancies with the construction plans.

ARTICLE VI
Fees and Expenses

§ 137-32. Review of drainage plan.

The Township shall charge a fee for review of the drainage plan, including the BMP operations and maintenance plan, to defray review costs incurred by the Township. The owner shall pay all such fees prior to permit issuance. Such fees shall be established and/or revised by a resolution of the Township Council.

ARTICLE VII
Stormwater Management Facility Operations and Maintenance Plans and Easements

§ 137-33. General requirements.

No regulated earth disturbance activities within the Township shall commence until approval by the Township of a BMP operations and maintenance plan which describes how the permanent (e.g., post construction) stormwater BMPs will be properly operated and maintained.

§ 137-34. Responsibilities for operations and maintenance of facilities, including BMPs, infiltration practices and detention facilities.

A. The maintenance of permanent stormwater management facilities shall be provided in accordance with the requirements of this chapter and Chapter 145, Subdivision and Land Development, except as may otherwise be approved by way of a specific agreement with the Township Council. The stormwater management facilities operations and maintenance plan for the project site shall establish responsibilities for the continuing operation and maintenance of all permanent portions of the storm-drainage system, as follows:

(1) Single-entity watershed.

(a) In all cases where the stormwater management facilities are designed to manage runoff from property in an ownership, as defined below, the maintenance responsibility for these facilities shall be with the single-entity owner. For subdivision and land developments, the owner shall enter into an agreement with the Township which specifies that the owner will properly maintain, repair and reconstruct the stormwater management facilities consistent with accepted practice, as determined by the Township Engineer. The agreement shall provide for regular inspections by the Township or its designee and contain such provisions, as necessary, to ensure timely correction of any maintenance deficiencies by the single-entity owner. A "single entity" shall be defined as an individual, association, public or private corporation, partnership firm, trust, estate or any other legal entity empowered to own real estate.

(b) Stormwater management facilities, including but not limited to infiltration practices and stormwater runoff collection and conveyance systems, as described herein, shall be continually maintained, repaired, reconstructed, and used by the property owner for the purpose intended. The property owner shall not discharge any substance into these facilities other than stormwater. Disconnection, improper use, improper maintenance or abandonment and nonuse of these facilities shall be considered and is, in fact, a violation of this chapter.

(2) Multiple property watershed.

(a) In cases where the watershed contributing stormwater runoff to a stormwater management facility is or will be in multiple ownership (i.e., separate owners of various portions of the watershed), the owner shall dedicate the permanent stormwater management facilities to the property owner who will own and maintain these facilities, consistent with the ownership and maintenance provision of the drainage plan. For subdivision and land developments, the owner shall enter into an agreement with the Township which specifies that the owner will properly maintain, repair, and reconstruct the stormwater management facilities consistent

with accepted practice, as determined by the Township Engineer. The agreement shall provide for regular inspections by the Township or its designee and contain such provisions, as necessary, to ensure timely correction of any maintenance deficiencies by the owner. An owner shall be defined as an individual, association, public or private corporation, partnership firm, trust, estate or any other legal entity empowered to own real estate.

(b) Stormwater management facilities, including but not limited to infiltration practices and stormwater runoff collection and conveyance systems, as described herein, shall be continually maintained, repaired, reconstructed, and used by the property owner for the purpose intended. The property owner shall not discharge any substance into these facilities other than stormwater. Disconnection, improper use, improper maintenance or abandonment and nonuse of these facilities shall be considered and is, in fact, a violation of this chapter.

(3) For stormwater management facilities, including infiltration practices constructed in an existing or proposed public road or immediately adjacent thereto, as described in this

chapter and/or Chapter 145, Subdivision and Land Development, the Township may, at the sole and absolute discretion of the Township Council, assume responsibility for all or a portion of the stormwater management facility. If specific stormwater management facilities are considered for dedication to the Township, or acceptance by the Township, for long-term maintenance, the following regulations shall apply:

(a) Stormwater runoff collection and conveyance facilities such as inlets, manholes, piping and headwalls shall be considered for acceptance if they accept and/or convey stormwater runoff from public land, such as public roads or public parks. Such stormwater management facilities must be located within lands dedicated in fee simple to the Township, or in drainage easements specifically dedicated to the Township.

(b) Detention facilities and infiltration practices including necessary outlet control structures, fencing, landscaping and/or subsurface improvements shall be considered for acceptance if they accept and/or manage and/or infiltrate stormwater runoff from public land such as public roads or public parks. Such facilities must be located within lands dedicated in fee simple to the Township and on land parcels that meet the following minimum criteria:

[1] The property dedicated must front on a public road and be provided with an access driveway and off-street parking for two vehicles. Such driveway and parking area shall be improved to meet minimum Township standards and Chapter 145, Subdivision and Land Development.

[2] The property dedicated must meet the minimum lot size and dimensional criteria of Chapter 180, Zoning, of the Code of Lower Saucon Township for the zoning district in which the property is located.

[3] The property dedicated must be provided with sufficient buffer and setback to meet the regulations of this chapter and provide a minimum setback of 20 feet between any property boundary line and any earthmoving that is required for the construction and/or maintenance of any proposed detention basin and/or infiltration practice.

[4] The property dedicated must be improved with the driveway and parking area and with topsoil, raking, seeding and grass meeting the minimum standards of Pennsylvania Department of Transportation Publication Form 408 for roadside restorations with grass. This criteria may be waived to the extent that portions of the property may be already stabilized in a wooded condition and that such wooded condition is undisturbed as part of the construction of the facilities for improvements.

[5] The owner proposing the dedication of these facilities shall provide financial resources to the Township to compensate for all or a portion of the cost that the Township would be incurring in the long-term operation and maintenance of the dedicated property and stormwater management facilities thereon. This financial resource shall be in the form of a cash payment in the minimum amount of $69,800 per acre of dedicated land. This minimum amount is established by this chapter, but can be modified by resolution of the Council, as necessary, to reflect actual long-term costs of maintenance of the detention basin facilities and properties.

[6] The owner proposing the dedication of infiltration practices shall provide financial resources to the Township to compensate for all or a portion of the cost that the Township would be incurring in the long-term operation and maintenance of said structures. This financial resource shall be in the form of a cash payment in the minimum amount of $9,665 per structure. This minimum amount is established by this chapter, but can be modified by resolution of the Council, as necessary, to reflect actual long-term costs infiltration practice facilities and properties.

B. The Township shall make the final determination on the continuing operations and maintenance responsibilities. The Township reserves the right to accept or reject the operations and maintenance responsibility for any or all of the storm drainage system.

C. Operation and Maintenance Fund.

(1) Persons installing stormwater BMPs shall be required to pay a specified amount to the Township Stormwater BMP Operations and Maintenance Fund to help defray costs of operations and maintenance activities. The amount may be determined as follows:

(a) If the BMP is to be privately-owned and maintained, the amount shall cover the cost of periodic inspections by the municipality in perpetuity, as determined by the Township;

(b) If the BMP is to be owned and maintained by the Township, the amount shall cover the estimated costs for operation and maintenance in perpetuity, as determined by the Township; and

(c) The amount shall then be converted to present worth of the annual series values.

(2) If a BMP is proposed that also serves as a recreation facility (e.g., ball field, lake), the Township may adjust the amount due accordingly.

§ 137-35. Adherence to plan.

It shall be unlawful to alter or remove any permanent stormwater management facilities required by an approved stormwater management facilities operations and maintenance plan or to allow the property to remain in a condition which does not conform to an approved stormwater management facility operations and maintenance plan unless an exception is granted in writing by the Township.

§ 137-36. Operations and maintenance agreement for privately owned stormwater BMPs.

A. The property owner shall sign an operations and maintenance agreement with the Township covering all portions of the storm drainage system that are to be privately owned. The agreement shall be substantially the same as the agreement in Appendix E[1] of this chapter.

B. Other items may be included in the agreement where determined by the Township to be reasonable or necessary to guarantee the satisfactory operation and maintenance of all permanent stormwater management facilities. The agreement shall be subject to the review and approval of the Township.

C. The property owner is required to provide an annual written inspection report for all BMPs to the Township.

§ 137-37. Stormwater easements.

A. Private stormwater easements shall be provided by the owner if the operation, maintenance, repair, restoration and replacement responsibilities have been assigned to a person other than the owner. The purpose of the easement shall be specified in any agreement in accordance with § 137-36.

B. An easement shall be dedicated to the Township on and a minimum 10 feet wide around any proposed stormwater management facility with the exception of individual household infiltration practices.

C. Stormwater easements shall be dedicated to the Township along all natural or man-made streams and watercourses within a subdivision or land development. These easements should be of sufficient width to convey a one-hundred-year design storm, assuming the upstream drainage basin to be fully developed. Easements shall also be provided where storm drainage swales, culverts or other structures traverse, enter or discharge onto private property. On private property, the entire easement area and fencing and landscaping (if any) shall be operated, maintained, repaired, restored and, if necessary, replaced by the owner. All easements shall be of sufficient width to reconstruct the stormwater management facilities contained within the easement. The Township shall not operate, maintain, repair, restore or replace any improvements within that easement unless such responsibility is specifically accepted by resolution.

(1) If stormwater runoff from public roads or public lands crosses through the easement, the Township may, at its sole discretion, upon satisfactory installation of improvements as specified in a developer's improvement agreement and maintenance agreement, and/or separate easement agreement, operate, maintain, repair, restore, and (if necessary) replace only the specific structural stormwater management improvements within the easement listed below:

(a) Piping.

(b) Inlets, manholes and junction boxes.

(c) Outlets and headwalls.

(d) Energy dissipation structures.

(e) Detention basin outlet control structures.

(f) Infiltration system.

(2) The landowner shall be responsible for all other operation, maintenance, repairs, restoration and replacements within this easement. For example, the landowner must:

(a) Mow the lawn.

(b) Officially maintain, repair, restore or replace detention and/or retention areas, and detention and/or retention facilities.

(c) Repair or replace fencing.

(d) Repair or replace landscaping, including special wetland plants or other vegetation specifically approved for the plan.

(e) Keep the area free of obstructions, structures, vegetation or accumulated sediment that may block or hinder the function and purpose of the stormwater management facility and the easement.

(f) Keep the area free of litter or garbage.

(g) Repair erosion and restore vegetation as necessary to keep the easement in good repair.

(h) Repair sinkholes that may develop.

D. Any drainage easement proposed for dedication to the Township must be separately recorded in a deed of easement.

§ 137-38. Recording of approved plan and related agreements.

A. For regulated activities specified in§ 137-5B(1) and (2) the owner of any land upon which permanent stormwater management facilities will be placed, constructed or implemented, as described in the stormwater management facility operations and maintenance plan, shall record the following documents in the Office of the Recorder of Deeds Northampton County, as applicable, within 90 days of approval of the stormwater management facility operations and maintenance plan by the Township:

(1) The operations and maintenance plan or a summary thereof.

(2) Operations and maintenance agreements under § 137-36.

(3) Easements under § 137-37.

B. The Township may suspend or revoke any approvals granted for the drainage plan upon discovery of the failure of the owner to comply with this section.

ARTICLE VIII

Prohibitions

§ 137-39. Prohibited discharges; exceptions.

A. No person in the Township shall allow or cause to allow stormwater discharges into the Township's separate storm sewer system which are not composed entirely of stormwater except as provided in Subsection B below or as allowed under a state or federal permit.

B. Discharges that are allowed, unless the Township finds that the discharge(s) does/do significantly contribute pollution to surface waters of the commonwealth, are listed below:

(1) Discharges or flows from firefighting activities.

(2) Discharges from potable water sources including water line flushing and fire hydrant flushing, if such discharges do not contain detectable concentrations of Total Residual Chlorine (TRC).

(3) Non-contaminated irrigation water, water from lawn maintenance, landscape drainage and flows from riparian habitats and wetlands.

(4) Diverted stream flows and springs.

(5) Non-contaminated pumped ground water and water from foundation and footing drains and crawl space pumps.

(6) Non-contaminated HVAC condensation and water from geothermal systems.

(7) Residential (i.e., not commercial) vehicle wash water where cleaning agents are not utilized.

(8) Non-contaminated hydrostatic test water discharges, if such discharges do not contain detectable concentrations of TRC.

C. In the event that the Township determines that any of the discharges identified in Subsection B significantly contribute to pollution of waters of the commonwealth or is so notified by DEP, the Township will notify the responsible person to cease the discharge.

D. Upon notice provided by the Township under Subsection C, the discharger will have a reasonable time, as determined by the Township, to cease the discharge consistent with the degree of pollution caused by the discharge.

E. Nothing in this section shall affect a discharger's responsibilities under state law.

§ 137-40. Prohibited connections.

A. Any drain or conveyance, whether on the surface or subsurface, which allows any nonstormwater discharge, including sewage, process wastewater and wash water to enter the separate storm sewer system and any connections to the storm drain system from indoor drains and sinks.

B. Any drain or conveyance connected from a commercial or industrial land use to the separate storm sewer system which has not been documented in plans, maps or equivalent records and approved by the Township.

§ 137-41. Roof drains and sump pumps.

A. Roof drains shall not be connected to streets, sanitary or storm sewers or roadside ditches, except as provided in Subsection B.

B. When it is more advantageous to connect directly to streets or storm sewers, connections of roof drains to streets or roadside ditches may be permitted by the Township.

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

§ 137-42. Alteration of stormwater management facilities.

A. No person shall modify, remove, fill, landscape or alter any existing stormwater management facilities without the written approval of the Township unless it is part of an approved maintenance program.

B. No person shall place any structure, fill, landscaping or vegetation into stormwater management facilities or within a drainage easement which would limit or alter the functioning of the stormwater management facilities without the written approval of the Township.

ARTICLE IX
Right of Entry; Notification; Enforcement

§ 137-43. Right of entry.

A. Upon presentation of proper credentials and with the consent of the owner, duly authorized representatives of the Township may enter at reasonable times upon any property within the Township to inspect the implementation, condition or operation and maintenance of the stormwater BMPs or to investigate or ascertain the condition of the subject property in regard to any aspect regulated by this chapter.

B. In the event that the owner refuses admission to the property, duly authorized representatives of the Township may seek an administrative search warrant issued by a District Justice to gain access to the property.

§ 137-44. Notification.

A. Whenever the Township finds that a person has violated a prohibition or failed to meet a requirement of this chapter, the Township may order compliance by written notice to the responsible person. Such notice may require, without limitation:

(1) The name of the owner of record and any other person against whom the Township intends to take action.

(2) The location of the property in violation.

(3) The performance of monitoring, analyses and reporting.

(4) The elimination of prohibited connections or discharges.

(5) Cessation of any violating discharges, practices or operations.

(6) The abatement or remediation of stormwater pollution or contamination hazards and the restoration of any affected property.

(7) Payment of a fine to cover administrative and remediation costs.

(8) The implementation of stormwater management facilities.

B. Such notification shall set forth the nature of the violation(s) and establish a time limit for correction of the violation(s). Said notice may further advise that should the violator fail to take the required action within the established deadline, the work will be done by the Township or its designee and the expense thereof, together with all related lien and enforcement fees, charges and expenses, shall be charged to the violator.

C. Failure to comply within the time specified shall also subject such person to the penalty provisions of this chapter. All such penalties shall be deemed cumulative and shall not prevent the Township from pursuing any and all other remedies available in law or equity.

§ 137-45. Violations deemed nuisance.

A. The violation of any provision of this chapter is hereby deemed a nuisance.

B. Each day that an offense continues shall constitute a separate violation.

§ 137-46. Suspension and revocation of permits and approvals.

A. Any building, land development or other permit or approval issued by the municipality may be suspended or revoked by the municipality for:

(1) Noncompliance with or failure to implement any provision of the permit.

(2) A violation of any provision of this chapter.

(3) 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.

B. A suspended permit or approval shall be reinstated by the Township when:

(1) The Township or its designee has inspected and approved the corrections to the stormwater management facilities or the elimination of the hazard or nuisance.

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

(3) Payment of all municipal fees, costs and expenses related to or arising from the violation has been made.

C. A permit or approval which has been revoked by the Township cannot be reinstated. The developer may apply for a new permit under the procedures outlined in this chapter.

§ 137-47. Violations and penalties.

A. Any person, partnership or corporation who or which has violated the provisions of this chapter shall, upon being found liable therefor in a civil enforcement proceeding commenced by the municipality, pay a judgment of not more than $500 plus all court costs, including reasonable attorney's fees incurred by the municipality as a result thereof. No judgment shall commence or be imposed, levied or payable until the date of the determination of a violation by the District Justice. If the defendant neither pays nor timely appeals the judgment, the municipality may enforce the judgment pursuant to a separate violation, unless the District Justice, determining that there has been a violation, further determines that there was a good faith basis for the person, partnership or corporation violating this chapter to have believed that there was no such violation, in which event

there shall be deemed to have been only one such violation until the fifth day following the date of the determination of a violation by the District Justice and thereafter each day that a violation continues shall constitute a separate violation.

B. The Court of Common Pleas, upon petition, may grant an order of stay upon cause shown, tolling the per diem judgment pending a final adjudication of the violation and judgment.

C. Nothing contained in this section shall be construed or interpreted to grant to any person or entity other than the Township the right to commence any action for enforcement pursuant to this section.

D. District Justices shall have initial jurisdiction in proceedings brought under this section.

E. In addition, the Township, through its Solicitor, may institute injunctive, mandamus or any other appropriate action or proceeding at law or in equity for the enforcement of this chapter. 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.

§ 137-48. Appeals.

Any person aggrieved by any action of the Township or its designee relevant to the provisions of this chapter may appeal using the appeal procedures established by law.

Appendix A
Storm Sewer Facilities Improvements Design and Construction Standards

All storm sewer facilities, including piping, inlets, manholes, endwalls and other facilities, shall be constructed in accordance with the following standards:

A. Storm sewer piping. All storm sewer pipe shall be either Class III reinforced concrete pipe or HDPE pipe. Pipe shall comply with the requirements of PennDOT Publication 408, Section 601. Bedding shall comply with the requirements of PennDOT Publication 408, Section 703.1, for Class B fine aggregate. Existing suitable material may be utilized with the approval of the Engineer.

B. Inlets, manholes and endwalls.

(1) All inlets, manholes and endwalls shall be either precast or cast in place concrete and shall comply with the requirements of PennDOT Publication 408, Section 605, and PennDOT R.C. Series, Standards for Roadway Construction except where "water quality inlets" are required.

(2) Bicycle-safe grates shall be provided for inlets within curbed roadway sections and any area subject to bicycle traffic. Steps shall be provided in inlets and manholes that exceed four feet in depth.

(3) For manholes less than seven feet in depth, a flat slab top shall be provided.

(4) Manhole covers shall have the words "Storm" or "Storm Sewer" lettered thereon.

(5) All endwalls shall have a footing that extends below the frost line

C. Special structures, such as culverts, inlet boxes, junction boxes or detention basin outlet structures, shall be detailed completely on approved development plans and shall be constructed in accordance with those plans.

D. All water quality facilities shall be designed and constructed in accordance with § 137- 15, Postconstruction water quality criteria.

E. The capture and conveyance of stormwater to an infiltration practice shall meet the minimum standards of this section. Infiltration practices shall be designed, constructed and inspected in accordance with the following standards:

1. Design of infiltration practices:
   a. For stormwater runoff from a single lot and infiltrated on the same lot:
      a.1. From buildings: gutters, downspouts, four-inch minimum diameter PVC pipe. (Schedule 40 PVC, or equal, under driveways.)
      a.2. From driveways: trench grate (PolyDrain®, Manufactured by ABT, Inc.®, or equal) or a yard catch basin may be utilized to capture driveway runoff and four-inch diameter PVC conveyance pipe. (Schedule 40 PVC, or equal, under driveway.) Both trench grates and yard inlets must be located beyond the ultimate road rights-of-way.

a.3. Underground conveyance pipe shall have a minimum pitch of 1/4-inch per foot.

b. For stormwater runoff from a public road and/or from one lot and being infiltrated on another lot:

b.1. Capture stormwater by way of standard Type C or Type M inlets or by way of manholes designed and constructed in accordance with PennDOT Specifications and Standard Drawings, with bicycle-safe grates.

b.2. Each inlet shall be provided with a removable hood (also known as an oil/water separator) designed to help retain floatables. This hood-andslide rail system shall be constructed of stainless steel or cast iron, or an alternate material, if approved by the Township, shall have an antisiphon feature and shall be installed in accordance with the manufacturer's specifications.

b.3. Each inlet shall be provided with a sump under the bottom of the removable hood (or bottom of inflow pipe, if lower) of 24 inches or more in depth, depending on the solids capacity required.

b.4. Stormwater shall be discharged into the infiltration practice aggregate from a perforated HDPE pipe constructed at a 0% slope with a capped end located two feet from the end of the infiltration practice aggregate.

c. For stormwater runoff from a public road and/or from adjacent private property, for facilities that will be dedicated to and accepted by the Township:

c.1. All requirements for stormwater runoff from a public road and/or from one lot and being infiltrated on another lot shall be met.

c.2. The capture inlets (with sump and oil/water separator) shall be connected to one or more infiltration manholes with standard cast iron manhole frames and covers located five feet outside the public road right-of-way in a designated drainage easement. The infiltration manholes shall be designed and constructed in accordance with PennDOT specifications and standard drawings. These manholes shall not be perforated but shall be connected to storm sewer piping which is perforated. Each manhole shall be provided with a sump (under the lowest outlet pipe invert) of 24 inches or more in depth, depending on the solids capacity required.

c.3. The required design layout is shown in Appendix H-1 and Appendix H2, as attached hereto and made a part thereof. [1]

2. Construction of infiltration practices:

a. The Township Engineer and Zoning Officer shall be notified 72 hours prior to the excavation of an infiltration practice so the Engineer (or his or her designee) can schedule an on-site visit to verify the size of the excavation in accordance with the plan and calculations.

[1] Editor's Note: Appendix H-1 and H-2 are included at the end of this chapter.

b. Excavation of the infiltration practice shall be the size and depth as shown on the approved lot grading plan.

c. The drainage portion of the excavation shall be filled with AASHTO No. 3 Crushed Aggregate (equivalent to 40% voids volume). Slag shall not be permitted as aggregate for infiltration practices.

d. A four-inch perforated vertical inspection standpipe shall be installed in the drainage aggregate for the full depth of the pit and connected to the inlet pipe(s). A cap shall be placed on the standpipe at finished grade.

e. For single-family detached lot infiltration practices, precast seepage pit rings with the Department of Environmental Protection (DEP) approved precast lids may be utilized to obtain required storage volume. A vertical inspection standpipe shall be installed full depth in the aggregate outside the seepage ring or from the precast lid if the inlet pipe penetrates the seepage ring. The area between the precast seepage ring and the excavated sidewalls shall be backfilled with AASHTO No. 3 Crushed Aggregate.

f. All infiltration practice aggregate shall be encapsulated in a layer of geotextile fabric meeting the requirements of the PennDOT Publication 408, Section 735, Construction Class 1.

g. All infiltration practices shall be covered with at least one foot of cover material, except for those components of the structure that extend to the surface of the ground.

h. No water shall be allowed to enter an infiltration area until all sediment has been removed from the upstream storm sewer.

3. Inspection and certification for infiltration practices receiving runoff from one lot and infiltrating stormwater on the same lot:

a. The Township may perform the inspection of the infiltration practice excavation for size, depth, and location requirements.

The lot owner shall provide the Township with a certification of completion stating the infiltration practice and stormwater collection system(s) was installed in accordance with the approved lot grading plan and this chapter. The certification shall be signed by the owner and the contractor who installed the infiltration practice(s) and collection and conveyance system. A copy of the delivery receipt for the crushed aggregate and seepage ring(s) or other type of structure shall be attached to the certification.

4. Inspection for infiltration practices receiving stormwater runoff from a public road and/or from one lot and being infiltrated on another lot:

a. The Township Engineer shall inspect these structures and their associated capture and conveyance system in accordance with the requirements of a developer's improvements agreement and procedures established for land development improvements.

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Appendix B
Watersheds and Release Rates

B-1 Map of Catasauqua Watershed Storm Drainage Problem Areas

B-2 Description of Catasauqua Watershed Storm Drainage Problem Areas

B-3 Map of Fry's Run Watershed Storm Drainage Problem Areas

B-4 Description of Fry's Run Watershed Storm Drainage Problem Areas

B-5 Map of Saucon Creek Watershed Storm Drainage Problem Areas

B-6 Description of Saucon Creek Watershed Storm Drainage Problem Areas

B-7 Release Rates Map: Catasauqua Creek, Monocacy Creek and Nancy Run Watersheds

B-8 Release Rates Map: Saucon Creek Watershed

B-9 Release Rates Map: Fry's Run Watershed

B-10 Release Rates Map: Delaware River (North) Watershed

Release rate maps for adopted Act 167 stormwater management plans are available at the Township Office. Release rates maps for stormwater management plans for watershed other than those with the Delaware River (North) watershed are also available at the Lehigh Valley Planning Commission Office.

The Delaware River (North) Watershed Act 167 Stormwater Management Plan dated February 28, 2002 notes one storm drainage problem area in Lower Saucon Township: rare street flooding at Orchard Road and Moyer Lane.

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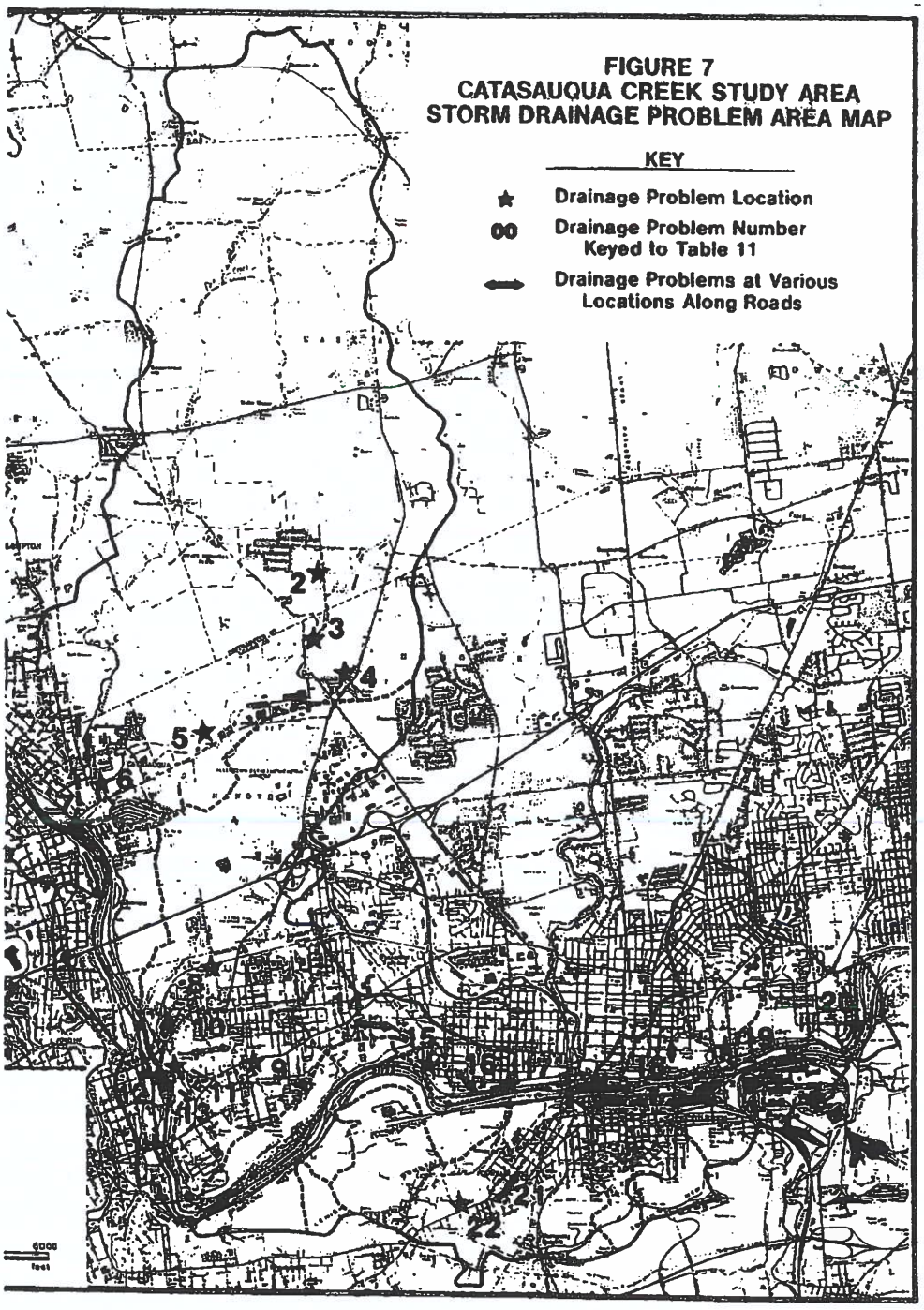
Township of Lower Saucon

Appendix B-1
Map of Catasauqua Watershed Storm Drainage Problem Areas



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Township of Lower Saucon

Appendix B-2
Table 11
Description of Catasauqua Watershed Storm Drainage Problem Areas

No.	Location	Municipality	Problem Description	Subarea No.	Reach No.	Proposed Solution
1	Catasauqua Borough Park	Borough of Catasauqua	Property flooding	23	12	None proposed
2	East Allen Manor	East Allen Township	Street flooding	17	16	Sewers proposed
3	Hanover Street	Hanover Township (N)	Street flooding	17/19	17	None proposed
4	Village View Development	Hanover Township (N)	Property flooding	18	—	None proposed
5	Willow Brook Road	Hanover Township (L)	Property flooding	22	21	None proposed
6	Race Street	Borough of Catasauqua	Street and property flooding	24	24	None proposed
7	Lehigh Street	Borough of Catasauqua	Street and property flooding	24	23	None proposed
8	Irving Street @ abandoned L&NE crossing	City of Allentown	Street flooding	32	—	Provide additional drainage collection
9	Kearney Street and Hanover Avenue	City of Allentown	Street flooding	38	—	Improve upstream collection system
10	East Green Street (Between Irving Street and Fenwick Street)	City of Allentown	Street flooding	39	38	Provide new relief collection system
11	Abandoned L&NE Railroad Culvert	City of Allentown	Property flooding	39	38	Upsize culvert and remove sanitary sewer from within culvert
12	North Bradford Street and East Allen Street	City of Allentown	Street and property flooding	39	38	Installation of relief culvert across railroad and street right-of-way
13	Adams Island	City of Allentown	Street flooding	40	—	None proposed
14	Ritter Street	City of Bethlehem	Street and property flooding	45	—	Storm sewer upgrade
15	Intersection of Craig Avenue and Spring Street	City of Bethlehem	Street and property flooding	45	—	Regrading intersection
16	Thirteenth Street to Eleventh Street	City of Bethlehem	Street and property flooding	47	—	None proposed
17	South end of Eighth Street	City of Bethlehem	Street and property flooding	47	—	Creation of drainage easement

No.	Location	Municipality	Problem Description	Subarea No.	Reach No.	Proposed Solution
18	Elm Street	City of Bethlehem	Street and property flooding swale erosion	49	—	Storm sewer upgrade and swale maintenance
19	Stefko Boulevard	City of Bethlehem	Property flooding	51	—	Upgrade swale and storm sewer
20	Area between Main Street and Lehigh Canal	Freemansburg	Street and property flooding	53	—	None proposed
21	Broadway, Long, Seneca Streets	Borough of Fountain Hill	Street and property flooding	60	59	None proposed
22	Dodson and Spiegel Street	Borough of Fountain Hill	Street and property flooding	60	—	None proposed

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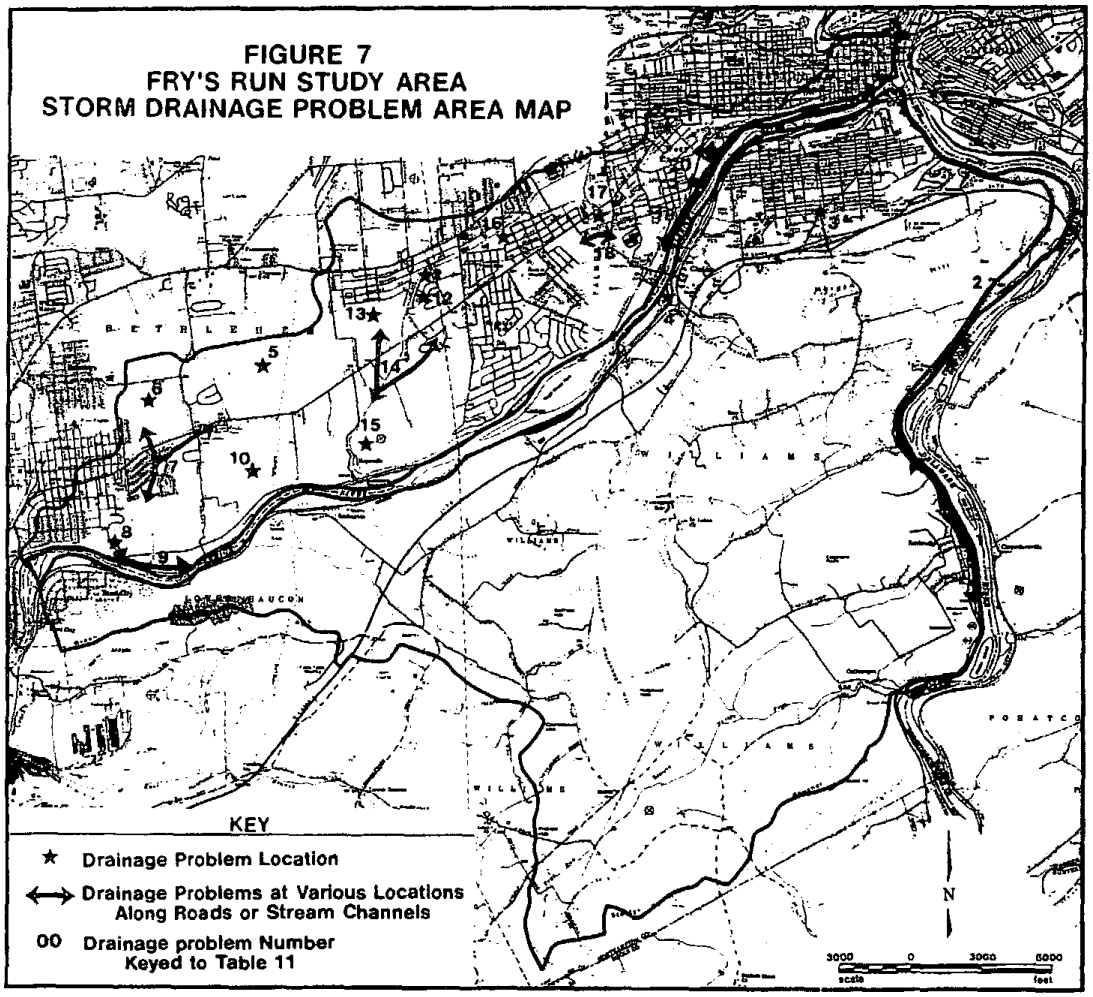
Appendix B-3
Map of Fry's Run Watershed Storm Drainage Problem Areas



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Township of Lower Saucon

Appendix B-4
Table 11
Description of Fry's Run Watershed Storm Drainage Problem Areas

No.	Location	Municipality	Problem Description	Subarea No.	Reach No.	Proposed Solution
1	Canal Road	Williams Township	Street flooding	18, 19	—	None proposed
2	Route 611 from Third Street south to Raubsville	Easton/Williams Township	Street flooding	19, 23-27, 29, 30, 74	—	None proposed
3	Area between Line Street and I-78	Easton/Williams Township	Street flooding	31	—	Regional detention and/or additional storm sewer capacity
4	Hugh Moore Parkway south of 25th Street bridge	Glendon	Street flooding	34	—	None proposed
5	Area east of Wagner Farms Subdivision	Bethlehem Township	Flooding	54	—	Strict discharge controls
6	Washington Street, North of Freemansburg Avenue	Bethlehem Township	Flooding	55	—	Strict discharge controls
7	Washington Street, south of Freemansburg Avenue	Bethlehem Township	Street flooding	55-56	54-55	Strict discharge controls; additional detention
8	Stream channel from Wilson Avenue to Rail Road Bridge	Bethlehem Township	Flows exceed stream capacity	56	55	Reroute waterway through new culvert under railroad; strict discharge controls
9	Wilson Avenue (overflow from Lehigh Canal)	Bethlehem Township	Street flooding	56-57	—	None proposed
10	Area south of Freemansburg Avenue east of Carter Road	Bethlehem Township	Severely eroded channel	57	—	None proposed
11	Chetwyn Terrace	Bethlehem Township	Street flooding	59	—	Strict discharge controls; additional detention

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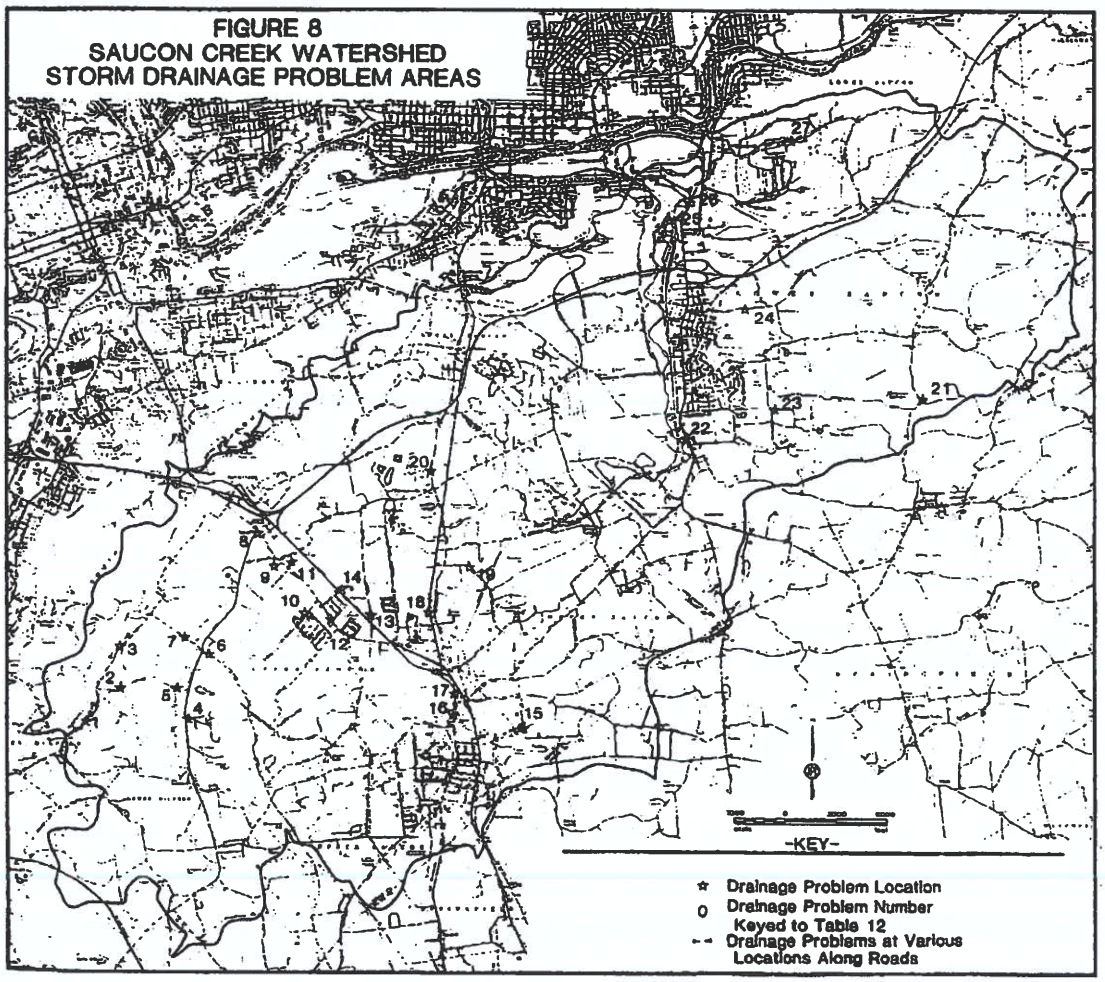
Appendix B-5
Map of Saucon Creek Watershed Storm Drainage Problem Areas



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Township of Lower Saucon

Appendix B-6
Table 12
Description of Saucon Creek Watershed Storm Drainage Problem Areas

No.	Location	Municipality	Problem Description	Subarea No.	Reach No.	Proposed Solution
1	S. Fifth Street and Brunner Rd. east to Twp. line	Upper Milford	Street/property flooding	15, 16, 17	—	None
2	Kozy Korner Lane	Upper Saucon	Street flooding	17, 18	17	Road and culvert improvement
3	Vera Cruz Road	Upper Saucon	Street flooding	Various	—	None proposed
4	Ackerman's Lane	Upper Saucon	Street/property flooding	14	—	New swale
5	Kozy Korner Lane	Upper Saucon	Street/property flooding	14, 20	14	Culvert improvements
6	Chestnut Hill Road South	Upper Saucon	Street/property flooding	20	—	None proposed
7	Chestnut Hill Road North	Upper Saucon	Street flooding	20, 21	20	Culvert improvements
8	Lanark Road, north of Saucon Valley Road	Upper Saucon	Street flooding	32	—	New swales
9	Lanark Road at West Saucon Valley Road	Upper Saucon	Property flooding	33, 34	33	Dredge channel
10	West Hopewell Road	Upper Saucon	Property flooding	31, 22	—	New swale
11	Saucon Valley Road, Lanark Road to Rt. 309	Upper Saucon	Property flooding	34	33	Dredge channel
12	Lanark Road at Chestnut Drive	Upper Saucon	Street flooding	42	—	None proposed
13	East Valley Road	Upper Saucon	Street/property flooding	43	—	New culverts
14	Route 309 at Hopewell Road	Upper Saucon	Street flooding	42, 44	42	None proposed
15	Jacoby Road at Suter Road	Upper Saucon	Street flooding	71	69, 70	New culverts and swales
16	Main Street, north of Coopersburg	Upper Saucon	Street flooding	79, 80	79	None proposed
17	Main Street, south of Liberty Street	Upper Saucon	Street/property flooding	81	80	None proposed
18	Old Bethlehem Pike North of Preston Lane	Upper Saucon	Street flooding	85	—	None proposed
19	Landis Mill Road	Upper Saucon	Street flooding	92, 92	91	None proposed
20	Old Bethlehem Pike North of Friedensville	Upper Saucon	Street flooding	96, 97	96	None proposed
21	Banko Lane	Lower Saucon	Property flooding	123	—	None proposed
22	Main Street and MacAdoo Street	Hellertown	Street/property flooding	127, 128	127	None proposed
23	Rose Lane	Lower Saucon	Property flooding	135	—	None proposed
24	Apple Street	Lower Saucon	Property flooding	136	—	None proposed
25	Traveler Avenue and Dearhorn Avenue	Bethlehem	Street flooding	166	163	None proposed
26	Route 412, north of Hellertown	Bethlehem	Street flooding	167	166	None proposed
27	Applebutter Road	Bethlehem	Street flooding	Various	Various	None proposed

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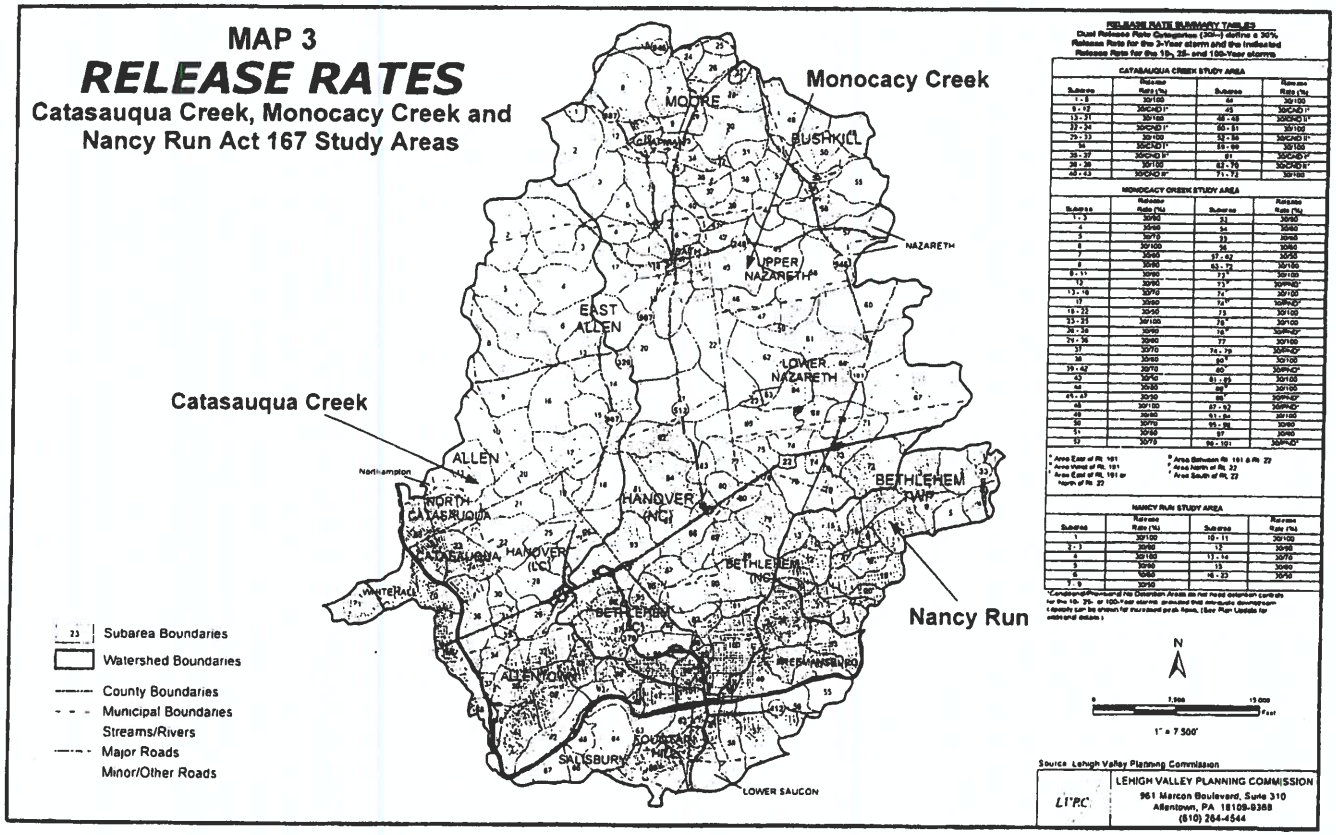
Township of Lower Saucon

Appendix B-7
Release Rates Map
Catasauqua Creek, Monocacy Creek and Nancy Run Watersheds



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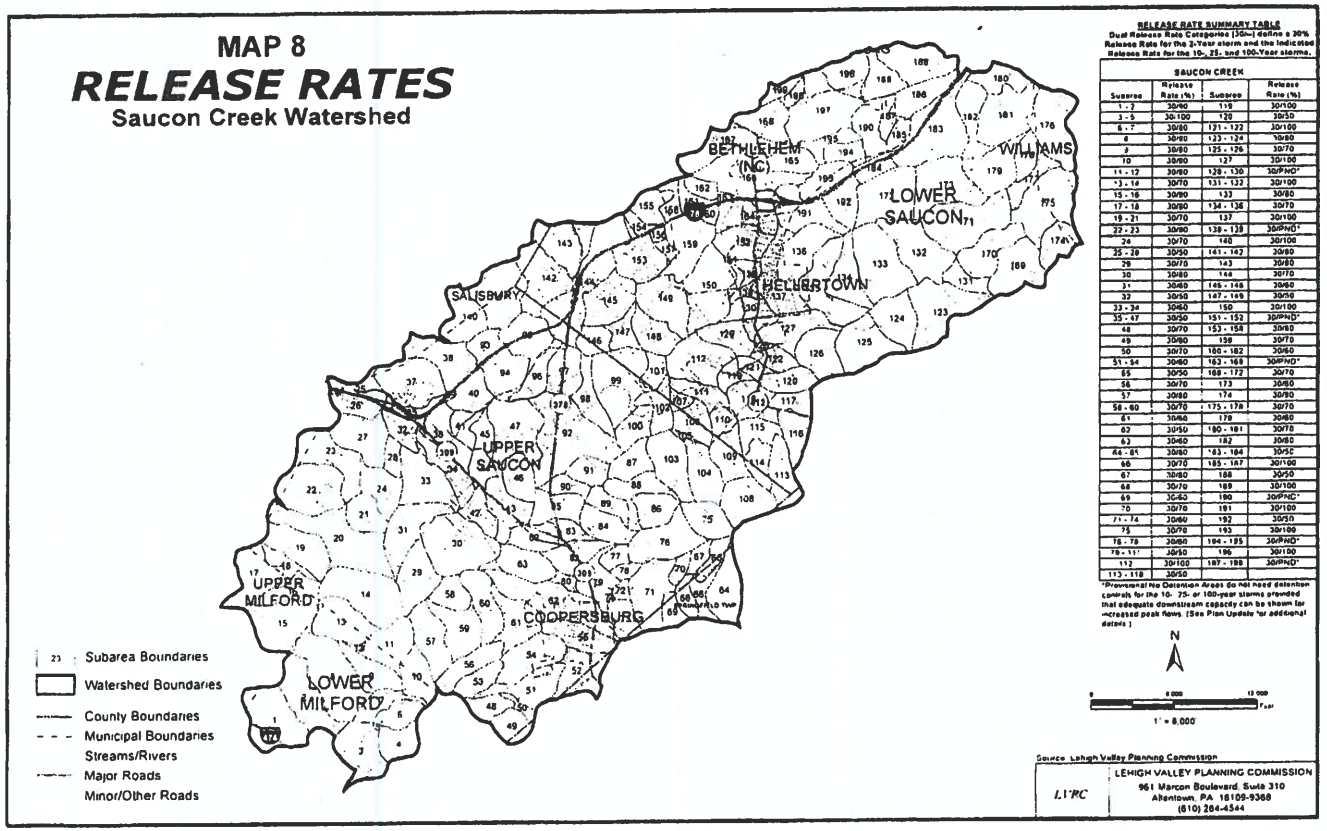
Township of Lower Saucon

Appendix B-8
Release Rates Map
Saucon Creek Watershed



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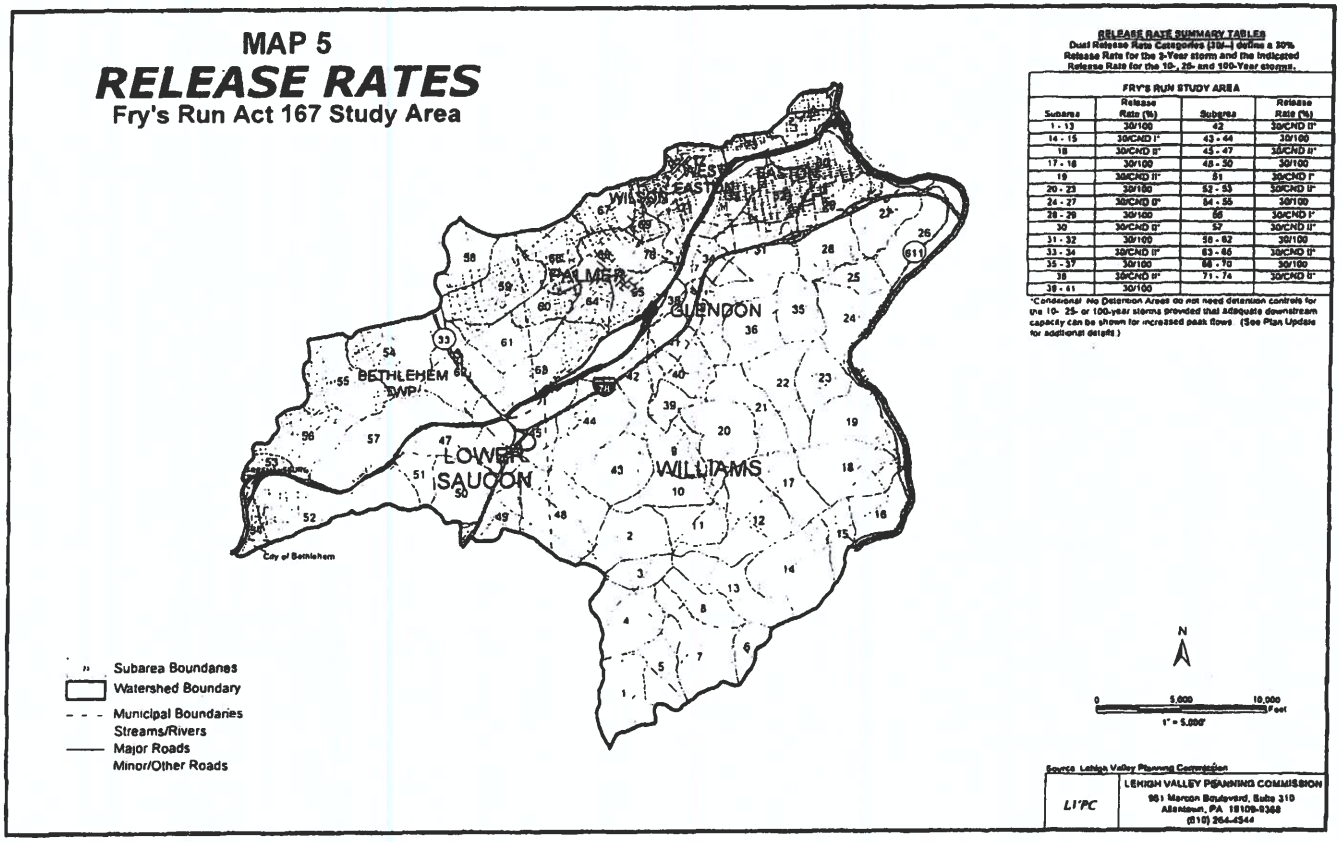
Township of Lower Saucon

Appendix B-9
Release Rates Map
Fry's Run Watershed



RELEASE RATE SUMMARY TABLES

Dual Release Rate Categories (30/--) define a 30% Release Rate for the 2-Year storm and the indicated Release Rate for the 10-, 25- and 100-Year storms.

FRY'S RUN STUDY AREA

Subarea	Release Rate (%)	Subarea	Release Rate (%)
1 - 13	30/100	42	30/CND II*
14 - 15	30/CND I*	43 - 44	30/100
16	30/CND II*	45 - 47	30/CND II*
17 - 18	30/100	48 - 50	30/100
19	30/CND II*	51	30/CND I*
20 - 23	30/100	52 - 53	30/CND II*
24 - 27	30/CND II*	54 - 55	30/100
28 - 29	30/100	56	30/CND I*
30	30/CND II*	57	30/CND II*
31 - 32	30/100	58 - 62	30/100
33 - 34	30/CND II*	63 - 66	30/CND II*
35 - 37	30/100	68 - 70	30/100
38	30/CND II*	71 - 74	30/CND II*
39 - 41	30/100		

*Condensed: No Delaware Areas do not need detention controls for the 10- 25- or 100-year storms provided that Adequate downstream capacity can be shown for increased peak flows (See Plan Update for additional details)

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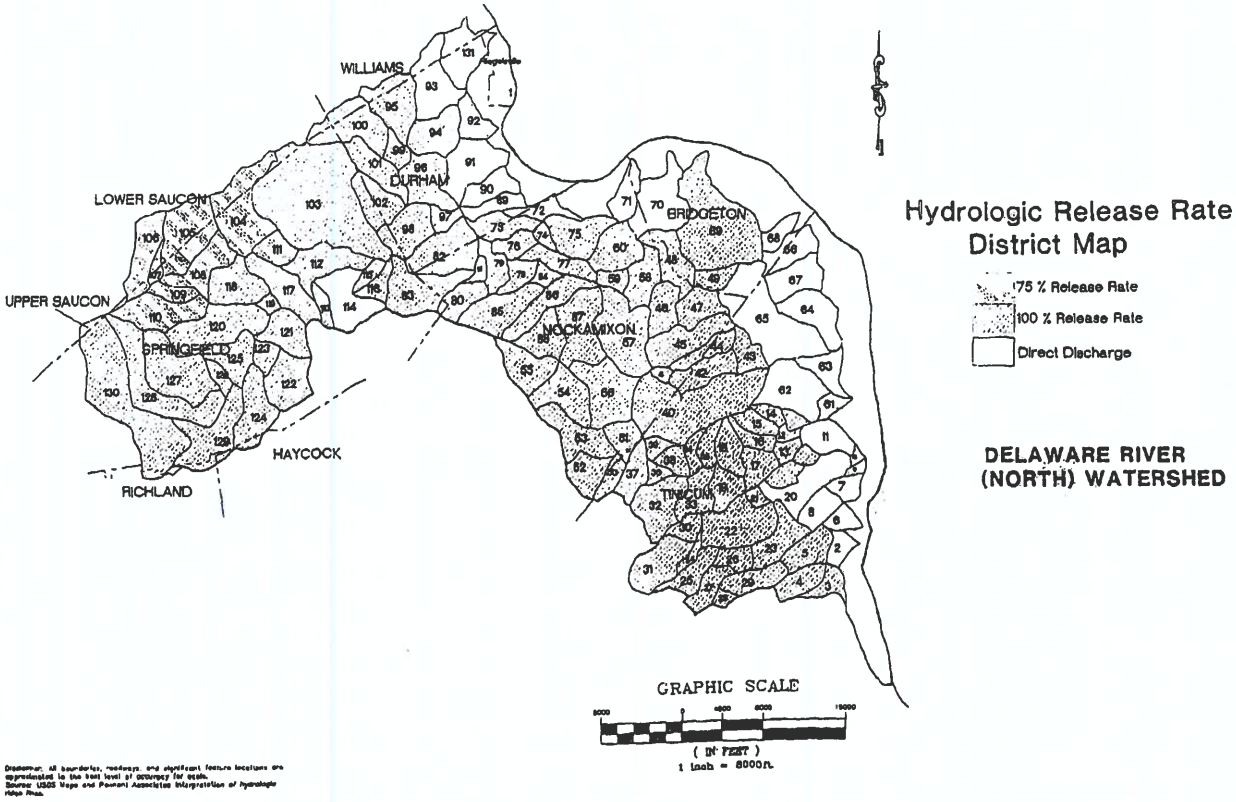
Appendix B-10
Release Rates Map
Delaware River (North) Watershed

Figure 8



Appendix C
Rainfall and Runoff

C-1 NRCS Type II 24-Hour Rainfall Distribution (Graphic and Tabular)

C-2 Intensity-Duration-Frequency Charts

C-3 Runoff Curve Numbers and Percent Imperviousness Values

C-4 Runoff Coefficients for the Rational Method

C-5 Manning "n" Values

C-6 Percent Direct Recharge Curve and Instructions

C-7 Percent Annual Rainfall vs BMP Design Runoff Chart

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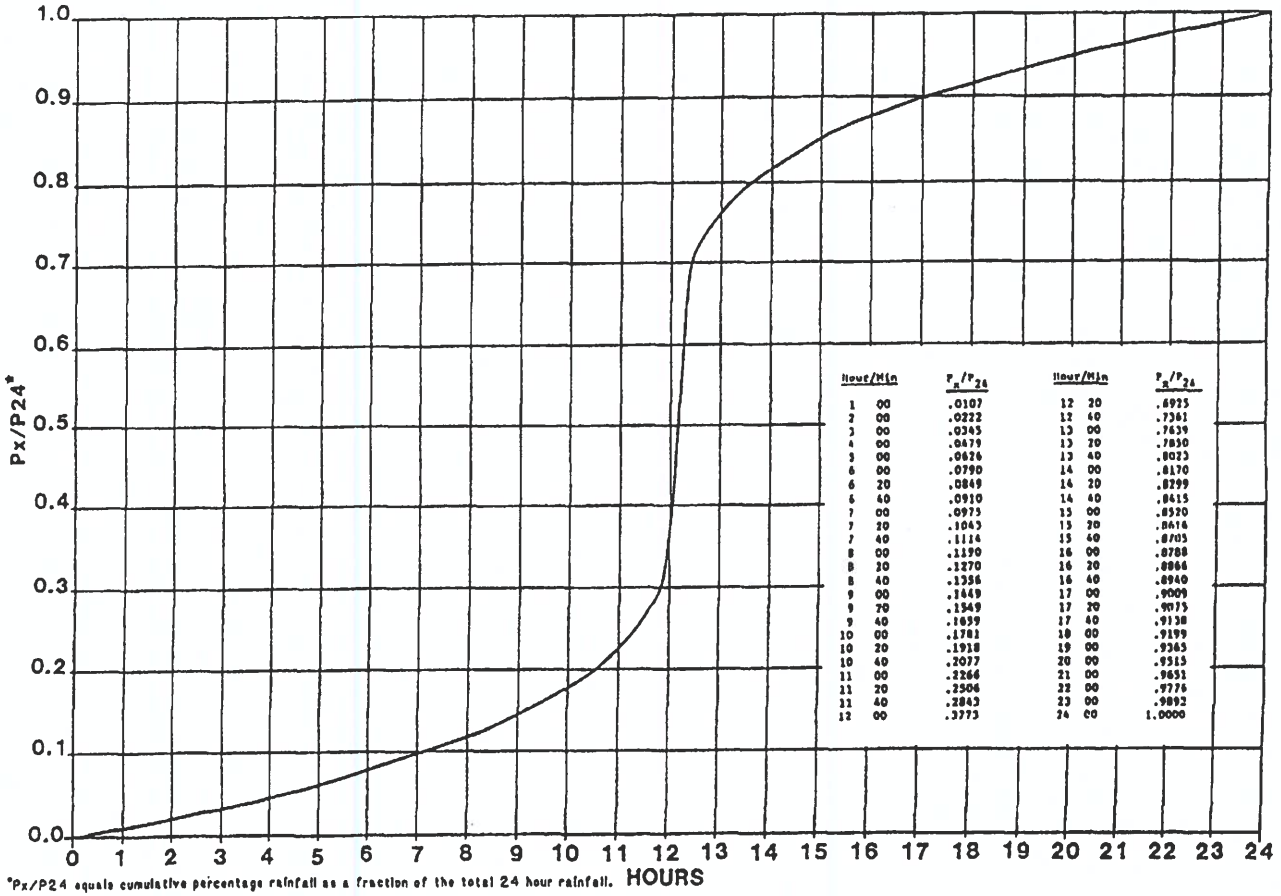
Township of Lower Saucon

Appendix C-1: NRCS Type II 24-Hour Rainfall Distribution



Hour/Min	P_x/P_{24}	Hour/Min	P_x/P_{24}
1 00	.0107	12 20	.6925
2 00	.0222	12 40	.7361
3 00	.0345	13 00	.7639
4 00	.0479	13 20	.7850
5 00	.0626	13 40	.8023
6 00	.0790	14 00	.8170
6 20	.0849	14 20	.8299
6 40	.0910	14 40	.8415
7 00	.0975	15 00	.8520
7 20	.1043	15 20	.8616
7 40	.1114	15 40	.8705
8 00	.1190	16 00	.8788
8 20	.1270	16 20	.8866
8 40	.1356	16 40	.8940
9 00	.1449	17 00	.9009
9 20	.1549	17 20	.9075
9 40	.1659	17 40	.9138
10 00	.1781	18 00	.9199
10 20	.1918	19 00	.9365
10 40	.2077	20 00	.9513
11 00	.2266	21 00	.9651
11 20	.2506	22 00	.9778
11 40	.2843	23 00	.9892
12 00	.3773	24 00	1.0000

Appendix C-2

PRECIPITATION INTENSITY AND DEPTH CHARTS*

Partial duration series-based point precipitation intensity frequency estimates (in inches/hour)
Average recurrence interval (years)

Duration	1	2	5	10	25	50	100
5-min	3.85	4.57	5.38	5.99	6.76	7.32	7.88
10-min	3.07	3.66	4.31	4.79	5.36	5.80	6.23
15-min	2.55	3.06	3.62	4.02	4.52	4.89	5.24
30-min	1.75	2.11	2.56	2.91	3.34	3.66	4.00
60-min	1.09	1.32	1.64	1.89	2.22	2.48	2.75
2-hr	0.650	0.785	0.984	1.14	1.36	1.54	1.74
3-hr	0.476	0.575	0.716	0.829	0.988	1.12	1.26
6-hr	0.303	0.364	0.451	0.523	0.627	0.715	0.812
12-hr	0.186	0.224	0.278	0.325	0.393	0.453	0.519
24-hr	0.109	0.131	0.164	0.191	0.232	0.266	0.304

Partial duration series-based point precipitation depth frequency estimates (in inches)
Average recurrence interval (years)

Duration	1	2	5	10	25	50	100
5-min	0.321	0.381	0.448	0.499	0.563	0.610	0.657
10-min	0.511	0.610	0.718	0.798	0.894	0.966	1.04
15-min	0.638	0.764	0.905	1.00	1.13	1.22	1.31
30-min	0.873	1.05	1.28	1.45	1.67	1.83	2.00
60-min	1.09	1.32	1.64	1.89	2.22	2.48	2.75
2-hr	1.30	1.57	1.97	2.28	2.72	3.09	3.48
3-hr	1.43	1.73	2.15	2.49	2.97	3.36	3.79
6-hr	1.82	2.18	2.70	3.13	3.75	4.28	4.86
12-hr	2.24	2.70	3.35	3.91	4.74	5.46	6.26
24-hr	2.62	3.14	3.93	4.59	5.56	6.39	7.30

*Source: NOAA Atlas 14, Volume 2, Version 3

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Township of Lower Saucon

Appendix C-3
Runoff Curve Numbers and Percent Imperviousness Values*

Cover Description		Curve numbers for hydrologic soil group**			
Land Use/Cover Type	**Average percent impervious area**	**A**	**B**	**C**	**D**
Open space (lawns, parks, golf courses, cemeteries, etc.):					
Good condition (grass cover greater than 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
c acre or less (townhouses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
a acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Woods		30	55	70	77
Agriculture	Refer to Table 2-2b in source document (TR55) by crop type and treatment.				

* Source: Natural Resources Conservation Service Technical Release No. 55, Second Edition, June 1986.

** Hydrologic soil group based on the county soil survey, latest edition.

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Township of Lower Saucon

Appendix C-4
Runoff Coefficients for the Rational Method*

Land Use	Hydrologic Soil Group and Slope Range**											
	A			B			C			D		
	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
Cultivated[A]	0.18[1]	0.23	0.28	0.24	0.29	0.33	0.30	0.34	0.38	0.33	0.37	0.41
	0.23[2]	0.29	0.34	0.30	0.36	0.40	0.36	0.41	0.45	0.39	0.44	0.48
Pasture[B]	0.09	0.13	0.17	0.19	0.24	0.29	0.27	0.31	0.36	0.31	0.35	0.39
	0.12	0.17	0.23	0.24	0.30	0.36	0.33	0.38	0.43	0.37	0.42	0.46
Meadow, lawn[C]	0.05	0.08	0.12	0.15	0.20	0.24	0.23	0.28	0.32	0.28	0.32	0.36
	0.07	0.12	0.17	0.19	0.25	0.30	0.28	0.34	0.39	0.33	0.39	0.43
Forest, woods	0.03	0.05	0.08	0.11	0.16	0.20	0.20	0.25	0.29	0.25	0.30	0.34
	0.04	0.08	0.12	0.15	0.21	0.26	0.25	0.31	0.36	0.31	0.37	0.41
Gravel	0.24	0.29	0.33	0.32	0.36	0.40	0.35	0.39	0.43	0.37	0.41	0.44
	0.30	0.36	0.40	0.38	0.43	0.47	0.42	0.46	0.50	0.44	0.48	0.51
Parking, other impervious	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87
	0.95	0.96	0.97	0.95	0.96	0.97	0.95	0.96	0.97	0.95	0.96	0.97
Residential, commercial, industrial and other "developed"	Runoff coefficients should be calculated based upon weighted average of impervious area coefficients and pervious area coefficients from above based upon soil type, slope and the particular development proposal.											

NOTES:

* Coefficients for all land uses except parking and other impervious cover are based on the Rossmiller Equation for translating NRCS curve numbers into Rational Method "c" values. The source for the parking and other impervious cover coefficients is RAWLS, W.J.; S.L. WONG and R.H. McCUEN, 1981. Comparison of urban flood frequency procedures. Preliminary draft report prepared for the Soil Conservation Service, Beltsville, MD.

** Hydrologic soil group based on the county soil survey, latest edition.

1 Runoff coefficients for storm recurrence intervals less than 25 years.

2 Runoff coefficients for storm recurrence intervals of 25 years or more.

A Represents average of cultivated land with and without conservation treatment from TR-55, January 1975. These values are consistent with several categories of cultivated lands from TR-55, June 1986.

B Represents grasslands in fair condition with 50% to 75% grass cover.

C Represents grasslands in good condition with greater than 75% grass cover.

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Township of Lower Saucon

Appendix C-5

Manning "n" Values by Typical Reach Description

Reach Description	Manning "n"
Natural stream, clean, straight, no rifts or pools	0.030
Natural stream, clean, winding, some pools and shoals	0.040
Natural stream, winding, pools, shoals, stony with some weeds	0.050
Natural stream, sluggish with deep pools and weeds	0.070
Natural stream or swale, very weedy or with timber under brush	0.100
Concrete pipe, culvert or channel	0.012
Smooth-bore HDPE pipe	0.010
Corrugated metal pipe	0.012-0.027*

* Depending upon type and diameter. Corrugated metal pipe is not acceptable for new construction.

Roughness Coefficients (Manning "n") for Sheet Flow

Surface Description	Manning "n"[1]
Smooth surfaces (concrete, asphalt, gravel, or bare soil)	0.011
Fallow (no residue)	0.050
Cultivated soils:	
Residue cover < = 20%	0.060
Residue cover > 20%	0.170
Grass:	
Short grass prairie	0.150
Dense grasses[2]	0.240
Bermuda grass	0.410
Range (natural)	0.130
Woods:[3]	
Light underbrush	0.400
Dense underbrush	0.800

1 The "n" values are a composite of information compiled by Engman (1986).

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

3 When selecting "n", consider cover to a height of about 0.1 foot. This is the only part of the plant cover that will obstruct sheet flow.

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Township of Lower Saucon

Appendix D

Recommendation Chart for Infiltration Stormwater Management BMPs in Carbonate Bedrock*																																
Site Risk Factors	Geology Type		Carbonate Bedrock																													
	Effective Soil Thickness	Less than 2 Feet	2 to 4 Feet									Over 4 Feet to 8 Feet										Over 8 Feet										
	Special Geologic Features**	Low/Med/High Buffer	Low Buffer			Medium Buffer			High Buffer			Low Buffer			Medium Buffer			High Buffer			Low Buffer			Medium Buffer			High Buffer				
Site Investigation Recommended		(Unacceptable)	Preliminary			Preliminary			Preliminary			Preliminary			Preliminary			Preliminary			Preliminary			Preliminary			Preliminary				
Design Factors	Infiltration Loading Rates (% Increase)***	(Unacceptable)	0-100%	100-300%	300-500%	0-100%	100-300%	300-500%	0-100%	100-300%	300-500%	0-100%	100-300%	300-500%	0-100%	100-300%	300-500%	0-100%	100-300%	300-500%	0-100%	100-300%	300-500%	0-100%	100-300%	300-500%	0-100%	100-300%	300-500%			
Program Summary Guidance****					1	1					1	2								1	2					1					

RECOMMENDED

NOT RECOMMENDED

* Source: Developed by Cahill Associates based on information in "Technical Best Management Practice Manual & Infiltration Feasibility Report," November 2002 and input from the LVPC, 2003.

** Special geologic feature buffer widths are as follows:
Low buffer is less than 50 feet.
Medium buffer is 50 feet to 100 feet.
High buffer is greater than 100 feet.

*** Rates greater than 500% not recommended.

**** Assumes adequately permeable soils and lack of natural constraints as required for all infiltration systems.

1 Infiltration systems may be allowed at the determination of the engineer and/or geologist, provided that a detailed site investigation is undertaken which confirms nature of rock, location of special geologic features, and adequacy of the buffer between the SGF and the proposed stormwater system(s).

2 In these special geologic features: low buffer situations, infiltration systems may be allowed at the determination of the engineer and/or geologist, provided that a detailed site investigation is undertaken and a twenty-five-foot buffer from SGFs is maintained.

Appendix E
Stormwater Best Management Practices Operations and Maintenance Agreement

THIS AGREEMENT, made and entered into this _____ day of _____, 20_____, by and between _____, (hereinafter the "Landowner), and _____, _____ County, Pennsylvania, (hereinafter "municipality");

WITNESSETH

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

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

WHEREAS, the stormwater management BMP Operations and Maintenance Plan approved by the municipality (hereinafter referred to as the "Plan") for the property identified herein, which is attached hereto as Appendix A and made part hereof, as approved by the municipality, provides for management of stormwater within the confines of the property through the use of Best Management Practices (BMP's) and

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

WHEREAS, for the purpose of this agreement, the following definitions shall apply:

- BMP – "Best Management Practice;" activities, facilities, designs, measures or procedures used to manage stormwater impacts from land development to protect and maintain water quality and groundwater recharge and to otherwise meet the purpose of the Municipal Stormwater Management Ordinance, including but not limited to infiltration trenches, seepage pits, filter strips, bioretention, wet ponds, permeable paving, rain gardens, grassed swales, forested buffers, sand filters and detention basins.
- Infiltration Trench – A BMP surface structure design, constructed, and maintained for the purpose of providing infiltration or recharge of stormwater into the soil and/or groundwater aquifer,
- Seepage Pit – An underground BMP structure designed, constructed, and maintained for the purpose of providing infiltration or recharge of stormwater into the soil and or groundwater aquifer,
- Rain Garden – A BMP overlain with appropriate mulch and suitable vegetation designed, constructed, and maintained for the purpose of providing infiltration or recharge of stormwater into the soil and/or underground aquifer; and

WHEREAS, the municipality requires, through the implementation of the Plan, that stormwater management BMPs as required by said Plan and the Municipal Stormwater Management Ordinance be constructed and adequately operate and maintained by the Landowner, his successors and assigns; and

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

1. The BMPs shall be constructed by the Landowner in accordance with the plans and specifications identified in the Plan.
2. The Landowner shall operate and maintain the BMP(s) as shown on the Plan in good working order acceptable to the municipality and in accordance with the specific maintenance requirements noted on the Plan.
3. The Landowner hereby grans permission to the municipality, its authorized agents and proper identification, to inspect the BMP(s) whenever it deems necessary. Whenever possible, the municipality shall notify the Landowner prior to entering the property.
4. In the event the Landowner fails to operate and maintain the BMP(s) as shown on the Plan in good working order acceptable to the municipality, the municipality or its representatives may enter upon the Property and take whatever action is deemed necessary to maintain said BMP(s). This provision shall not be construed to allow the municipality to erect any permanent structure on the land of the Landowner. It is expressly understood and agreed that the municipality is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the municipality.
5. In the event the municipality, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Landowner shall reimburse the municipality for all expenses (direct and indirect) incurred within 10 days of receipt of invoices from the municipality and if not timely paid, a municipal lien shall be placed upon premises for 100% of the invoice amount, plus statutorily allowed fees, expenses and costs.
6. The intent and purpose of this Agreement is to ensure the proper maintenance of the on-site BMP(s) by the Landowner; provided, however, that this Agreement shall not be deemed to create or effect any additional liability of any party for damage alleged to result from or be caused by stormwater runoff.
7. The Landowner, its executors, administrators, assigns, and other successors in interests, hereby release and hold harmless the municipality's employees and designated representatives from all damages, accidents, casualties, occurrences or claims which might arise or be asserted against said employees and representatives from the construction, presence, existence, or maintenance of the BMP(s) by the Landowner or municipality. In the event that a claim is asserted against the municipality, its designated representatives or employees, the municipality shall promptly notify the Landowner and the Landowner shall defend, at his own expense, any su8it based on the claim. If any judgement or claims against the municipality's employees or designated representatives shall be allowed, the Landowner shall pay all costs and expenses regarding said judgement or claim.
8. The municipality shall inspect the BMP(s) as necessary to ensure their continued functioning.

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

ATTEST:

WITNESS of the following signature and seals:

(SEAL) For the municipality:

_____

(SEAL) For the Landowner:

_____

ATTEST:

_____ (City, Borough, Township)

County of _____, Pennsylvania

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

GIVEN UNDER MY HAND THIS _____ DAY OF _____, 20_____.

_____ _____

NOTARY PUBLIC **(SEAL)**

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Township of Lower Saucon

Appendix F
Low Impact Development Practices

ALTERNATIVE APPROACH FOR MANAGING STORMWATER RUNOFF

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

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

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

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

- Protecting natural depression storage areas. Depression storage areas have no surface outlet, or drain very slowly following a storm event. They can be commonly seen as ponded areas in farm fields during the wet season or after large runoff events. Traditional development practices eliminate these depressions by filling or draining, thereby obliterating their ability to reduce surface runoff volumes and trap pollutants. The volume and release-rate characteristics of depressions should be protected in the

design of the development site. The depressions can be protected by simply avoiding the depression or by incorporating its storage as additional capacity in required detention facilities.

- Avoiding introduction of impervious areas. Careful site planning should consider reducing impervious coverage to the maximum extent possible. Building footprints, sidewalks, driveways and other features producing impervious surfaces should be evaluated to minimize impacts on runoff.

- Reducing the hydraulic connectivity of impervious surfaces. Impervious surfaces are significantly less of a problem if they are not directly connected to an impervious conveyance system (such as storm sewer). Two basic ways to reduce hydraulic connectivity are routing of roof runoff over lawns and reducing the use of storm sewers. Site grading should promote increasing travel time of stormwater runoff and should help reduce concentration of runoff to a single point in the development.

- Routing roof runoff over lawns. Roof runoff can be easily routed over lawns in most site designs. The practice discourages direct connections of downspouts to storm sewers or parking lots. The practice also discourages sloping driveways and parking lots to the street. By routing roof drains and crowning the driveway to run off to the lawn, the lawn is essentially used as a filter strip.

- Reducing the use of storm sewers. By reducing use of storm sewers for draining streets, parking lots, and back yards, the potential for accelerating runoff from the development can be greatly reduced. The practice requires greater use of swales and may not be practical for some development sites, especially if there are concerns for areas that do not drain in a "reasonable" time. The practice requires educating local citizens and public works officials, who expect runoff to disappear shortly after a rainfall event.

- Reducing street widths. Street widths can be reduced by either eliminating on-street parking or by reducing roadway widths. Municipal planners and traffic designers should encourage narrower neighborhood streets, which ultimately could lower maintenance.

- Limiting sidewalks to one side of the street. A sidewalk on one side of the street may suffice in low-traffic neighborhoods. The lost sidewalk could be replaced with bicycle/recreational trails that follow back-of-lot lines. Where appropriate, backyard trails should be constructed using pervious materials.

- Using permeable paving materials. These materials include permeable interlocking concrete paving blocks or porous bituminous concrete. Such materials should be considered as alternatives to conventional pavement surfaces, especially for low-use surfaces such as driveways, overflow parking lots and emergency access roads.

- Reducing building setbacks. Reducing building setbacks reduces driveway and entry walks and is most readily accomplished along low-traffic streets where traffic noise is not a problem.

- Constructing cluster developments. Cluster developments can also reduce the amount of impervious area for a given number of lots. The biggest savings is in street length, which also will reduce costs of the development. Cluster development clusters the construction activity onto less-sensitive areas without substantially affecting the gross density of development.

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Township of Lower Saucon

Appendix G
Preliminary Site Investigation and Testing Requirements

Required Data and Site Information: The following data shall be gathered utilizing standard testing procedures as part of a Preliminary Site Investigation:

- Bedrock composition. Any apparent boundaries between carbonate and noncarbonate bedrock must be verified by a qualified geotechnical professional.
- Bedrock structural geology. This includes the possible presence of faults and mapping of conspicuous fracture traces or lineaments.
- Overburden and soil mantle composition and thickness.
- Permeability of the soil.
- Depth to the seasonal high water table.
- Presence of special geologic features. This includes sinkholes, closed depressions, fracture traces, lineaments, joints, faults, caves, pinnacles and geologic contacts between carbonate and noncarbonate bedrock.

Preliminary Site Investigation Required for Sites Intending to Use Infiltration

Review of Available Data, Maps and Reports: Some of the required information, as listed above, can be found in existing published data. Suggested resources include the following:

- Geologic maps and references for the development area.
- The Little Lehigh Creek Basin Carbonate Prototype Area Closed Depression Map (available at the LVPC).
- USGS topographic maps.
- Lehigh and Northampton County soil survey maps.
- Aerial photographs from the LVPC or other sources.
- Relevant Pennsylvania Geologic Survey Open File Reports that provide maps of sinkholes and Karst features for Lehigh County (OF 87-01) and Northampton County (OF 87-02).

- Kochanov and Reese (2003). Density of Mapped Karst Feature in South-Central and Southeastern Pennsylvania (Map 68).

- DCNR Online Sinkhole Inventory (http://www.dcnr.state.pa.us/topogeo/hazards/sinkhole/default.asp).

Field Inspections: In addition to gathering data from published sources, a field inspection of the proposed site is required. A field inspection shall provide additional information relating to site features such as carbonate bedrock features, indicators of seasonal high stream level or water table levels, streams, springs, etc.

Soil Test Pit and Percolation Test Requirements: A minimum of one test pit and a minimum of two percolation tests are required for every site; see qualifications in § 137-17I(3). A test pit is a two-foot-to-three-foot wide, eight-foot deep trench excavated with a backhoe for observing subsurface conditions. The test pits will be used to describe soil depth and quality, including soil horizons, and testing of permeability or percolation rates and can be conducted by a certified soil scientist, or qualified geotechnical professional.

Percolation tests are to be conducted as follows (adapted from 25 Pa. Code § 73.15, Percolation Tests).

1. The percolation tests shall be made in separate holes uniformly spaced over the possible infiltration practice.

2. An "initial presoak" shall not be performed.

3. Percolation holes located within the possible infiltration practice shall be used in the calculation of the average percolation rate.

4. Holes having a uniform diameter of six inches to 10 inches shall be bored or dug as follows:

    a. To the depth of the bottom of the possible infiltration BMP.

    b. Alternate depths if the test pits/auger holes indicate that the soils are more suitable at a different depth (i.e., if a clay horizon is identified and more suitable soils are located beneath the horizon, and infiltration test should be performed in the suitable horizon).

5. The bottom and sides of the hole shall be scarified with a knife blade or sharp-pointed instrument to completely remove any smeared soil surfaces and to provide a natural soil interface into which water may percolate. Loose material shall be removed from the hole. Two inches of coarse sand or fine gravel shall be placed in the bottom of the hole to protect the soil from scouring and clogging of the pores.

6. Immediately before the percolation test, as a final presoak, water shall be placed in the hole to a minimum depth of six inches over the gravel and readjusted every 30 minutes for one hour.

7. The drop in the water level during the last 30 minutes of the final presoaking period shall be applied to the following standard to determine the time interval between readings for each percolation hole:

   a. If water remains in the hole, the interval for readings during the percolation test shall be 30 minutes.

   b. If no water remains in the hole, the interval for readings during the percolation test may be reduced to 10 minutes.

8. After the final presoaking period, water in the hole shall again be adjusted to approximately six inches over the gravel and readjusted when necessary after each reading.

   a. Measurement to the water level in the individual percolation holes shall be made from a fixed reference point and shall continue at the interval determined from Step 7 (above) for each individual percolation hole until a minimum of eight readings are completed or until a stabilized rate of drop is obtained, whichever occurs first. A stabilized rate of drop means a difference of 1/4 inch or less of drop between the highest and lowest readings of four consecutive readings.

   b. The drop that occurs in the final period in percolation test holes, expressed as inches per hour, shall be used to calculate the average percolation rate.

   c. When the rate of drop in a percolation test is too slow to obtain a measurable rate, the rate of 0.25 inches per hour shall be assigned to that hole for use in calculating the average percolation rate. The infiltration practice may be placed over holes with no measurable rate when the average percolation rate for the possible infiltration practice is within the acceptable range.

      When a percolation test hole yields a percolation rate of greater than 12 inches per hour in carbonate geology, no infiltration practice shall be designed or installed within 25 feet of this hole unless the municipality determines that a testing anomaly caused the fast percolation rate and a retest of the area yields acceptable percolation rates. When a percolation test hole yields a percolation rate of greater than 12 inches per hour in noncarbonate geology, no infiltration practice shall be designed or installed within 25 feet of this hole without a proposed method of stormwater renovation designed to protect groundwater quality and to minimize the risk of subsidence. This method of stormwater renovation must be proposed by a certified soil scientist or qualified geotechnical professional.

   d. If the infiltration rate is to be considered in the sizing of an infiltration practice, the infiltration rate shall be determined based on the percolation rate reduced by a reduction factor as follows:

Infiltration Rate = (Percolation Rate)/(Reduction Factor)

Where the Reduction Factor is given by:

$$R_f = \frac{2d_1 - \Delta d}{DIA} + 1$$

With:

d_1 = Initial water depth (inches)
Δd = Average/final water level drop (inches)
DIA = Diameter of the percolation hole (inches)

Additional Site Investigation and Testing Required Where Infiltration is Proposed

Soil Test Pit Requirements: The required number of test pits varies with effective soil thickness. As risk factors increase, the number of test pits increases. A minimum of two test pits, uniformly spaced within the proposed infiltration practice (i.e., the two pits should be centered on each half of the proposed infiltration practice), are required for any site proposing infiltration unless the applicant can demonstrate to the satisfaction of the Township that one test pit is adequately representative of the area proposed for infiltration. For larger infiltration practices, multiple test pits shall be developed at the densities as listed below:

Effective Soil Thickness (feet)	Test Pit Density (per acre of proposed infiltration practice)*	Percolation Tests (per acre of proposed infiltration practice)**	Auger Grid Spacing (feet on-center)***
8	4	8	50
4 to 8	6	12	35
2 to 4	8	16	25

* Number of test pits required = Infiltration square feet/43,560 square feet x test pit density from chart rounded up to the nearest whole number.

** Number of percolation tests required = Infiltration square feet/43,560 square feet x percolation tests from chart rounded up to the nearest whole number.

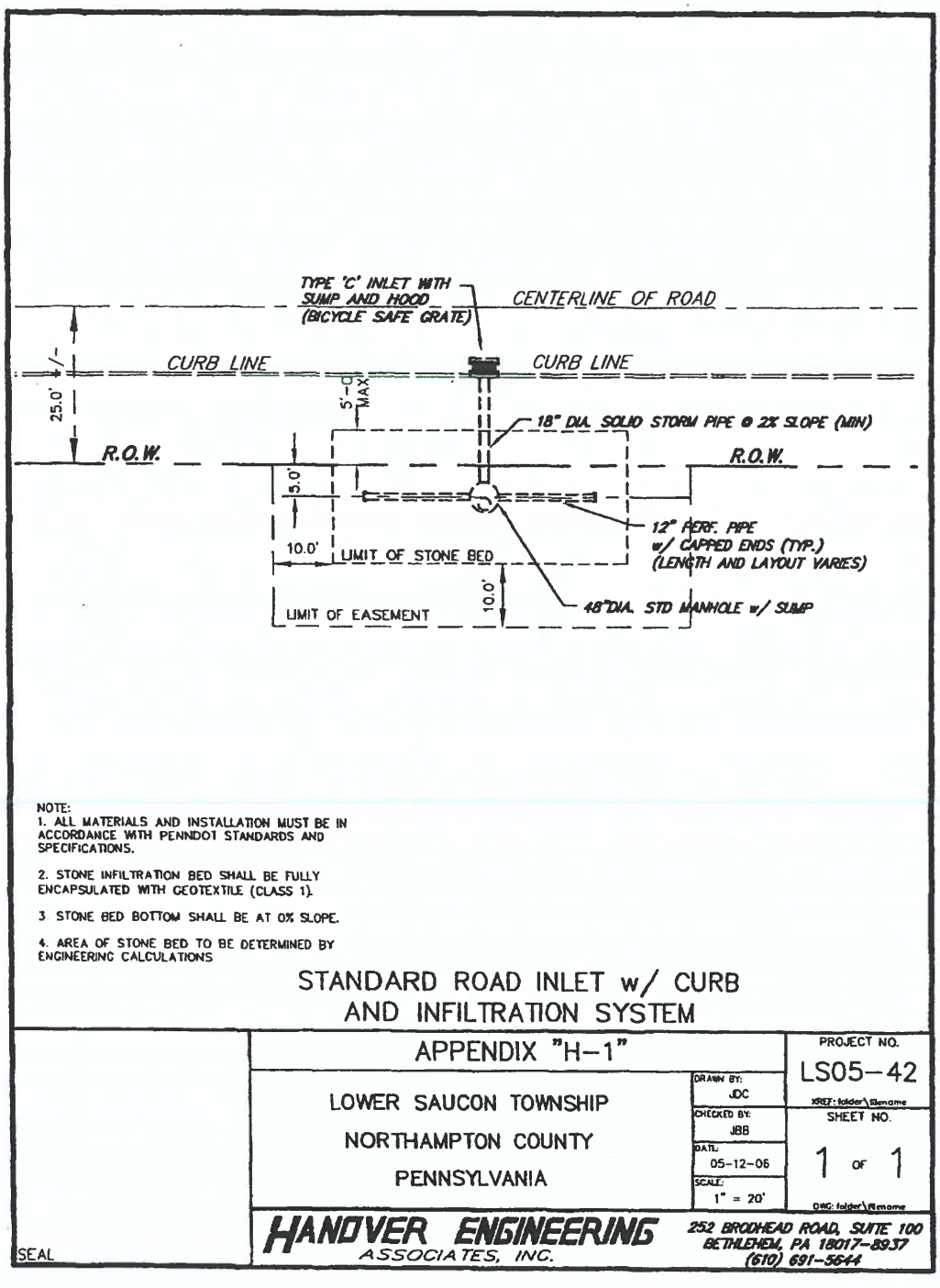
*** Auger testing is only required on carbonate sites.

Soil Auger Testing Requirements for Carbonate Areas: Because soil depth is not uniform in many carbonate areas, test pits will not be sufficient to accurately determine the depth to bedrock. Auger testing shall be performed in a grid pattern across any area proposed for infiltration in carbonate areas, spaced as indicated in the above table. Alternatively, ground penetration radar may be utilized to determine soil depths.

Percolation Testing Requirements: For each proposed infiltration practice, percolation tests shall be conducted at the densities listed in the table above; however, a minimum of six percolation tests shall be conducted with a vertical component permeability test unless the applicant can demonstrate to the satisfaction of the Township that fewer tests accurately

represent the percolation rate of the proposed infiltration practice. Additional testing shall be required if the initial test results show significant variability in the vertical component percolation rate.

Appendix H-1
Standard Road Inlet With Curb and Infiltration System



NOTE:
1. ALL MATERIALS AND INSTALLATION MUST BE IN ACCORDANCE WITH PENNDOT STANDARDS AND SPECIFICATIONS.

2. STONE INFILTRATION BED SHALL BE FULLY ENCAPSULATED WITH GEOTEXTILE (CLASS 1).

3. STONE BED BOTTOM SHALL BE AT 0% SLOPE.

4. AREA OF STONE BED TO BE DETERMINED BY ENGINEERING CALCULATIONS

STANDARD ROAD INLET w/ CURB AND INFILTRATION SYSTEM

	APPENDIX "H-1"	PROJECT NO. LS05-42
	LOWER SAUCON TOWNSHIP NORTHAMPTON COUNTY PENNSYLVANIA	DRAWN BY: JDC CHECKED BY: JBB DATE: 05-12-06 SCALE: 1" = 20' SHEET NO. 1 OF 1
SEAL	HANOVER ENGINEERING ASSOCIATES, INC.	252 BROADHEAD ROAD, SUITE 100 BETHLEHEM, PA 18017-8937 (610) 691-5644

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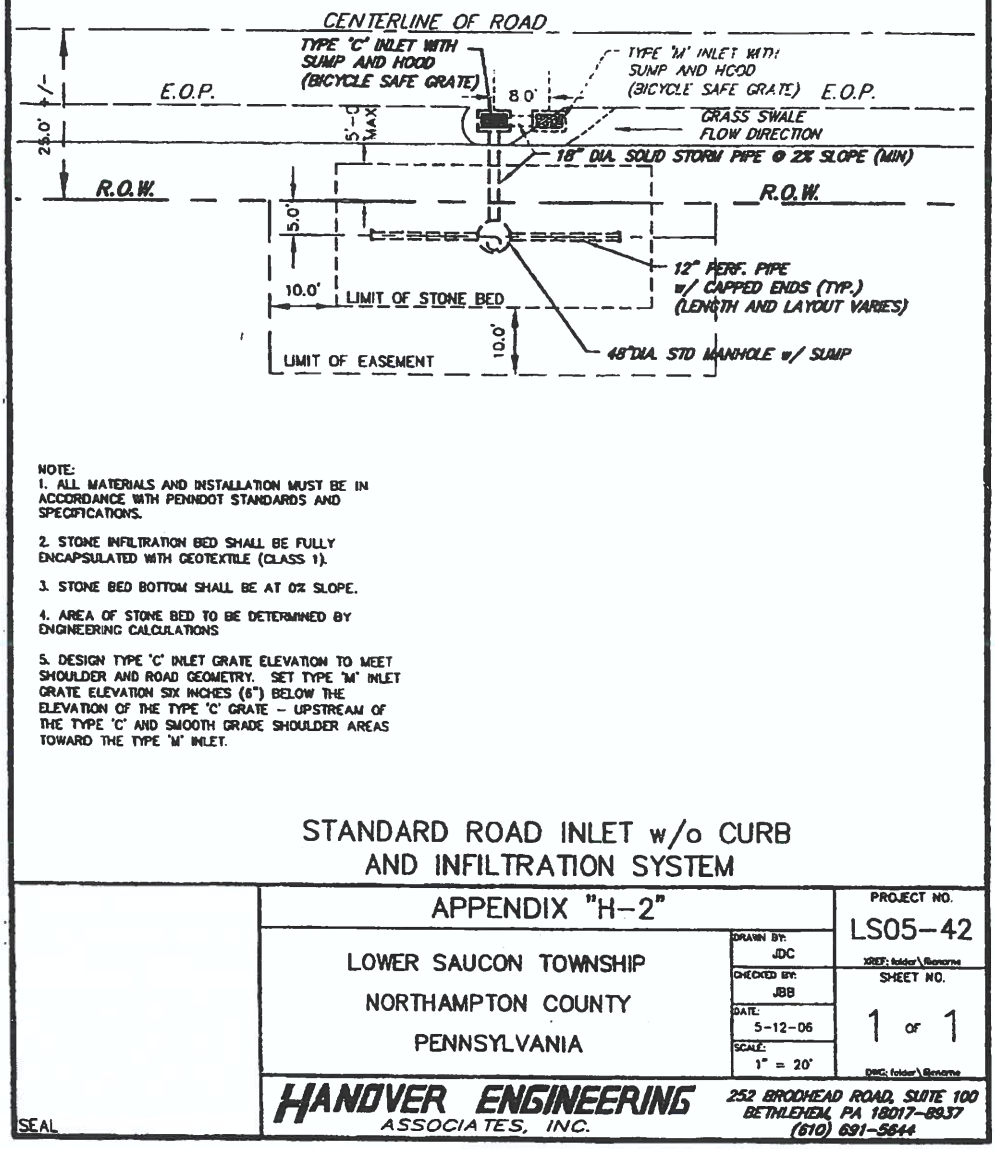
Township of Lower Saucon

Appendix H-2
Standard Road Inlet Without Curb and Infiltration System



NOTE:
1. ALL MATERIALS AND INSTALLATION MUST BE IN ACCORDANCE WITH PENNDOT STANDARDS AND SPECIFICATIONS.

2. STONE INFILTRATION BED SHALL BE FULLY ENCAPSULATED WITH GEOTEXTILE (CLASS 1).

3. STONE BED BOTTOM SHALL BE AT 0% SLOPE.

4. AREA OF STONE BED TO BE DETERMINED BY ENGINEERING CALCULATIONS

5. DESIGN TYPE 'C' INLET GRATE ELEVATION TO MEET SHOULDER AND ROAD GEOMETRY. SET TYPE 'M' INLET GRATE ELEVATION SIX INCHES (6") BELOW THE ELEVATION OF THE TYPE 'C' GRATE – UPSTREAM OF THE TYPE 'C' AND SMOOTH GRADE SHOULDER AREAS TOWARD THE TYPE 'M' INLET.

STANDARD ROAD INLET w/o CURB
AND INFILTRATION SYSTEM

SEAL	APPENDIX "H-2"	PROJECT NO. LS05-42
	LOWER SAUCON TOWNSHIP NORTHAMPTON COUNTY PENNSYLVANIA	DRAWN BY: JDC CHECKED BY: JBB DATE: 5-12-06 SCALE: 1" = 20'
	HANOVER ENGINEERING ASSOCIATES, INC.	252 BROADHEAD ROAD, SUITE 100 BETHLEHEM, PA 18017-8937 (610) 691-5644

SHEET NO. 1 OF 1

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Township of Lower Saucon

Appendix I

Plan Covenant Notes

Storm Drainage Maintenance

"Storm Drainage General Covenant

The Owners, their heirs, assignees, and/or grantees of the property shown on this Plan shall be responsible for the operation, maintenance, repair, reconstruction and/or replacement of the stormwater management facilities, including but not limited to inlets, outlets, drainage pipe(s), energy dissipation facilities, fencing, drainage swale(s), infiltration practice basin(s), infiltration practice facilities, best management practice (BMP) facilities, stilling basin(s), detention facilities, natural watercourses and pond(s), which are located within the boundaries of the property. Said maintenance shall include, but not be limited to cleaning, removal of pollutants and debris, repair of erosion conditions, closure of sinkholes, and maintenance of vegetation. No building or structure shall be constructed within the drainage easements shown on the Plans approved by the Township of Lower Saucon, nor shall the stormwater management facilities planned for the drainage easements be altered from design conditions shown on Plans approved by the Township of Lower Saucon without the express written approval of the Township of Lower Saucon.

Roadside gutters or swales shall not be obstructed by driveways or other fill or structures.

Individual lot owners are responsible to ensure that the lots are graded in conformance with the Plan's stormwater design.

Storm Drainage Easement

"Storm Drainage Easement Maintenance Covenant

Certain lots noted/created by the Plan entitled "_____," dated _____, as prepared by _____, are subject to drainage easements as shown on this Plan. The Owners, their heirs, assignees, and/or grantees of the property shown on this Plan shall be responsible for the operation, maintenance, repair, reconstruction and/or replacement of the stormwater management facilities within these drainage easements, unless some or all of the facilities are specifically dedicated to the Township and specifically accepted by the Township by resolution. Stormwater management facilities include, but are not limited to inlets, outlets, drainage pipe(s), energy-dissipation facilities, fencing, drainage swale(s), infiltration practice basin(s), infiltration practice facilities, best management practice (BMP) facilities, stilling basin(s), detention facilities, natural watercourses and pond(s). Said maintenance shall include, but not be limited to, cleaning,

removal of pollutants and debris, repair of erosion conditions, closure of sinkholes and maintenance of vegetation.

No building or structure shall be constructed, fill be placed, or vegetation be planted, other than approved groundcover within the drainage easements shown on this Plan, nor shall the improvements planned for the drainage easements be altered from design conditions shown on Plans approved by the Township of Lower Saucon without the express written approval of the Township of Lower Saucon.

The Township has the right, but not the obligation, to enter the drainage easements on the Owner's property for the purpose of inspection. The Township may operate, maintain, repair, reconstruct, and/or replace the stormwater management facilities in the drainage easement if, after reasonable notice, the Owner fails to operate, maintain, repair, reconstruct, or replace the facilities. In the event the Township provides operation, maintenance, repairs, reconstruction, or replacement, the Township may charge the Owner for the costs of that work, plus a 20% surcharge for administrative expenses, plus the costs expended by the Township if a Municipal lien or suit in assumpsit or equity is filed, which expense the Owner(s) hereby agree to assume and pay."

Private Infiltration

'Individual Lot Infiltration Practice Facility Covenant

This Covenant shall apply to all Owners of lots which are required, according to the Plan entitled _____," dated _____, as prepared by _____, to construct individual lot infiltration practice facilities for management and control of stormwater runoff from their buildings, driveways or other impervious or semi-impervious ground cover. An individual lot infiltration practice facility is an area which consists of excavated earth filled with loose stone or similar material and/or infiltration structures or devices and into which surface water generated by precipitation is directed for infiltration into the ground. The Owners of these lots are solely responsible for the design, construction, operation and maintenance of these individual lot infiltration practice facilities to be located on their lot. Specifically, <Lot Numbers> require individual lot infiltration practice facilities.

Prior to construction, the Owner shall submit to the Township an Individual Lot Infiltration Practice Facility Plan, prepared and sealed by a professional engineer, in accordance with the Drainage Plan approved for the Plan, and applicable stormwater management ordinances and regulations.

This Individual Lot Infiltration Practice Facility Plan must be reviewed and approved by the Township prior to the issuance of a building permit. The Owner shall deposit funds in amounts to be determined by the Township to cover costs of review and inspection. Prior to issuance of an occupancy permit, the Owner's design engineer shall provide a certification to the Township that the individual lot infiltration practice facilities were installed in accordance with the approved plans.

This Individual Lot Infiltration Practice Facility Covenant shall be binding upon the Owners of any lot that require an individual lot infiltration practice facility and shall also be binding upon their heirs, successors, and assigns.' "

and:

"For all lots that propose any infiltration practices that are to be maintained by private lot owners, whether designed with the approved Preliminary Plan or required to be designed in an Individual Lot Infiltration Practice Facility Plan, the following Covenant applies:

'Privately Owned Infiltration Practice Facility Covenant

This Covenant shall apply to all owners of lots which contain a Privately Owned Infiltration Practice Facility according to the Plan entitled "_____," dated _____, as prepared by _____. A privately owned infiltration practice facility is located on an individually owned lot and, more particularly, the lots set forth below, which consists of an area of excavated earth filled with loose stone or similar material and/or infiltration structures or devices and into which surface water generated by precipitation is directed for infiltration into the ground. These Owners are solely responsible for the operation, maintenance, repair, reconstruction, and replacement of any privately owned infiltration practice facility located on their lot. Specifically, <Lot Numbers> contain a privately owned infiltration practice facility.

The operation, maintenance, repair, reconstruction and replacement of any privately owned infiltration practice facility are subject to inspection by the Township. The Township has the right, but not the obligation, to enter a lot owner's property for the purpose of inspecting the operation and condition of privately owned infiltration practice facility. The Township may operate, maintain, repair, reconstruct, and/or replace a privately owned infiltration practice facility if, after reasonable notice, the Owner fails to properly operate, maintain, repair, reconstruct or replace their facility. In the event the Township operates, maintains, repairs, reconstructs, and/or replaces a privately owned infiltration practice facility, the Township may charge the Owner for the costs of that work, plus a 20% surcharge for administrative expenses, plus the costs expended by the Township if a Municipal lien or suit in assumpsit or equity is filed, which expense the Owner(s) agree to assume and pay.

This Privately Owned Infiltration Practice Facility Covenant shall be binding upon the Owners of any lot that contains, or is required to contain, a privately owned infiltration practice facility and shall also be binding upon their heirs, successors, and assigns.' "

Public Infiltration Plan Covenant Notes

The Developer agrees to pay a maintenance contribution in the amount established by the Township Stormwater Ordinance (or applicable revisions thereto) for all infiltration areas proposed to be dedicated to the Township for perpetual maintenance.

and:

"For all lots that are proposed on any plan that proposes to contain infiltration practice facilities to serve roadway and/or other areas, whether pervious or impervious, which are to be dedicated to and maintained by the Township, whether in public right-of-way or in an easement on private property, the following Covenant applies:

'Public Infiltration Practice Facility Covenant

This Covenant shall apply to all owners of lots which are required, according to the Plan entitled _____," dated _____, as prepared by _____, to contain a public infiltration practice facility. A public infiltration practice facility is an area to be maintained by the Township which consists of excavated earth filled with loose stone or similar material and/or infiltration structures or devices and into which surface water generated by precipitation is directed for infiltration into the ground.

These lot owners shall not cause or permit sedimentation or environmentally hazardous materials to enter the public infiltration practice facilities.

Public infiltration practice facilities are located within a drainage easement. No building or structure shall be constructed within the drainage easements shown on the Plan, nor shall the improvements planned for the drainage easements be altered from design conditions shown on these plans without the approval of the Township of Lower Saucon. The maintenance of the ground surface of such easements shall be the responsibility of the individual lot owners. The ground surface of these drainage easements shall be maintained in a grassed or otherwise improved condition, and shall be kept free of all obstructions, including but not limited to such obstructions as fill, temporary or permanent structures, and plants, (other than grass or other approved ground cover).

The Township, or its designees, has the right but not the obligation to enter the public infiltration facility easement on the Owner's property at any time for the purpose of inspection, operation, maintenance, repair, reconstruction, and/or replacement of the public infiltration facility.

Section 2. Violations and Penalties.

The Violation and Penalty provisions of the Code, where not revised herein, shall remain unchanged.

Section 3. Severability.

The provisions of this Ordinance are severable. If any section, subsection, sentence, clause or phrase of this Ordinance is, for any reason, held to be unconstitutional, illegal, or otherwise invalid, such decision shall not affect the validity of the remaining provisions of this Ordinance. The Council of Lower Saucon Township hereby declares that it would have passed this Ordinance, and each section, subsection, clause or phrase hereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses and phrases be declared unconstitutional, illegal, or otherwise invalid.

Section 4. Repealer

All Ordinances and parts of Ordinances inconsistent herewith are hereby repealed to the extent of such inconsistencies.

Section 5. Effective Date.

The provisions of this Ordinance shall become effective ten (10) days after adoption.

ENACTED and **ORDAINED** this 21st day of September, 2022.

ATTEST:

Mark Hudson
Township Manager

LOWER SAUCON TOWNSHIP

Jason Banonis
Council President