STORMWATER MANAGEMENT ORDINANCE

ORDINANCE NO. 4-2015

MUNICIPALITY OF

NORTH UNION TOWNSHIP

FAYETTE COUNTY, PENNSYLVANIA

Adopted at a Public Meeting Held on

June 9, 2015

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ARTICLE I - GENERAL PROVISIONS

Section 101. Short Title

This Ordinance shall be known and may be cited as the "North Union Township Stormwater Management Ordinance for the Monongahela River Watershed ,Youghiogheny River Watershed and Cheat River Watershed."

Section 102. Statement of Findings

The governing body of the municipality finds that:

A. Inadequate management of accelerated runoff of stormwater resulting from development throughout a watershed increases flows and velocities, contributes to erosion and sedimentation, overtaxes the carrying capacity of streams and storm sewers, greatly increases the cost of public facilities to carry and control stormwater, undermines flood plain management and flood control efforts in downstream communities, reduces groundwater recharge, threatens public health and safety, and increases nonpoint source pollution of water resources.

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

C. Stormwater is an important water resource, which provides groundwater recharge for water supplies and base flow of streams, which also protects and maintains surface water quality.

D. Federal and state regulations require certain municipalities to implement a program of stormwater controls. These municipalities are required to obtain a permit for stormwater discharges from their separate storm sewer systems under the National Pollutant Discharge Elimination System (NPDES).

Section 103. Purpose

The purpose of this Ordinance is to promote health, safety, and welfare within the municipality and its watershed by minimizing the harms and maximizing the benefits described in Section 102 of this Ordinance, through provisions designed to:

A. Meet legal water quality requirements under state law, including regulations at 25 Pa. Code 93 to protect, maintain, reclaim, and restore the existing and designated uses of the waters of this Commonwealth.

B. Preserve the natural drainage systems as much as possible.

C. Manage stormwater runoff close to the source.

D. Provide procedures and performance standards for stormwater planning and management.

E. Maintain groundwater recharge to prevent degradation of surface and groundwater quality and to otherwise protect water resources.

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

G. Provide proper operation and maintenance of all SWM BMPs that are implemented within the municipality.

H. Provide standards to meet NPDES permit requirements.

Section 104. Statutory Authority

A. Primary Authority:

The Municipality is empowered to regulate land use activities that affect stormwater impacts by the authority of Section 2704 of the Second Class Township Code.

B. Secondary Authority:

The municipality also is empowered to regulate land use activities that affect runoff by the authority of the Act of July 31, 1968, P.L. 805, No. 247, The Pennsylvania Municipalities Planning Code, as amended.

Section 105. Applicability

All regulated activities and all activities that may affect stormwater runoff, including land development and earth disturbance activity, are subject to regulation by this Ordinance.

Section 106. Repealer

Any other ordinance provision(s) or regulation of the municipality inconsistent with any of the provisions of this Ordinance is hereby repealed to the extent of the inconsistency only.

Section 107. Severability

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

Section 108. Compatibility with Other Requirements

Approvals issued and actions taken under this Ordinance do not relieve the applicant of the responsibility to secure required permits or approvals for activities regulated by any other code, law, regulation, or ordinance.

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

ARTICLE II - DEFINITIONS

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

A. Words used in the present tense include the future tense; the singular number includes the plural, and the plural number includes the singular; words of masculine gender include feminine gender; and words of feminine gender include masculine gender.

B. The word "includes" or "including" shall not limit the term to the specific example but is intended to extend its meaning to all other instances of like kind and character.

C. The words "shall" and "must" are mandatory; the words "may" and "should" are permissive.

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.

Applicant - A landowner, developer, or other person who has filed an application to the municipality for approval to engage in any regulated activity at a project site in the municipality.

Best Management Practice (BMP) - Activities, facilities, designs, measures, or procedures used to manage stormwater impacts from regulated activities, to meet state water quality requirements, to promote groundwater recharge, and to otherwise meet the purposes of this Ordinance. Stormwater BMPs are commonly grouped into one of two broad categories or measures: "structural" or "nonstructural." In this Ordinance, nonstructural BMPs or measures refer to operational and/or behavior-related practices that attempt to minimize the contact of pollutants with stormwater runoff whereas structural BMPs or measures are those that consist of a physical device or practice that is installed to capture and treat stormwater runoff. Structural BMPs include, but are not limited to, a wide variety of practices and devices, from large-scale retention ponds and constructed wetlands, to small-scale underground treatment systems, infiltration facilities, filter strips, low impact design, bioretention, wet ponds, permeable paving, grassed swales, riparian or forested buffers, sand filters, detention basins, and manufactured devices. Structural stormwater BMPs are permanent appurtenances to the project site.

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

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

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

DEP - The Pennsylvania Department of Environmental Protection.

Development Site (Site) - See Project Site.

Disconnected Impervious Area (DIA) - An impervious or impermeable surface that is disconnected from any stormwater drainage or conveyance system and is redirected or directed to a pervious area, which allows for infiltration, filtration, and increased time of concentration as specified in Appendix B, Disconnected Impervious Area.

Disturbed Area - An unstabilized land area where an earth disturbance activity is occurring or has occurred.

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

Existing Condition - The dominant land cover during the 5-year period immediately preceding a proposed regulated activity.

FEMA - Federal Emergency Management Agency.

Floodplain - Any land area susceptible to inundation by water from any natural source or delineated by applicable FEMA maps and studies as being a special flood hazard area. Also includes areas that comprise Group 13 Soils, as listed in Appendix A of the Pennsylvania DEP Technical Manual for Sewage Enforcement Officers (as amended or replaced from time to time by DEP).

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

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

Hydrologic Soil Group (HSG) - Infiltration rates of soils vary widely and are affected by subsurface permeability as well as surface intake rates. Soils are classified into four HSGs (A, B, C, and D) according to their minimum infiltration rate, which is obtained for bare soil after prolonged wetting. The NRCS defines the four groups and provides a list of most of the soils in the United States and their group classification. The soils in the area of the development site may be identified from a soil survey report that can be obtained from local NRCS offices or conservation district offices. Soils become less pervious as the HSG varies from A to D (NRCS [3,4]).

Impervious Surface (Impervious Area) - A surface that prevents the infiltration of water into the ground. Impervious surfaces (or areas) shall include, but not be limited to: roofs; additional indoor living spaces, patios, garages, storage sheds and similar structures; and any new streets or sidewalks.

Decks, parking areas, and driveway areas are not counted as impervious areas if they do not prevent infiltration.

Karst - A type of topography or landscape characterized by surface depressions, sinkholes, rock pinnacles/uneven bedrock surface, underground drainage, and caves. Karst is formed on carbonate rocks, such as limestone or dolomite.

Land Development (Development) - Inclusive of any or all of the following meanings: (i) the improvement of one lot or two or more contiguous lots, tracts, or parcels of land for any purpose involving (a) a group of two or more buildings or (b) the division or allocation of land or space 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; (ii) any subdivision of land; (iii) development in accordance with Section 503(1.1) of the PA Municipalities Planning Code.

Municipality – North Union Township, Fayette County, Pennsylvania.

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

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

Pervious Area - Any area not defined as impervious.

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

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

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

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

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

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

Runoff - Any part of precipitation that flows over the land.

Sediment - Soils or other materials transported by surface water as a product of erosion.

State Water Quality Requirements - The regulatory requirements to protect, maintain, reclaim, and restore water quality under Title 25 of the Pennsylvania Code and the Clean Streams Law.

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

Stormwater Management Facility - Any structure, natural or man-made, that, due to its condition, design, or construction, conveys, stores, or otherwise affects stormwater runoff. Typical stormwater management facilities include, but are not limited to: detention and retention basins; open channels; storm sewers; pipes; and infiltration facilities.

Stormwater Management Plan - The County of Fayette Stormwater Management Plan Act 167 for managing stormwater runoff adopted by the County of Fayette as required by the Act of October 4, 1978, P.L. 864, (Act 167), as amended, and known as the "Storm Water Management Act."

Stormwater Management Best Management Practices - Is abbreviated as **BMPs** or **SWM BMPs** throughout this Ordinance.

Stormwater Management Site Plan - The plan prepared by the developer or his representative indicating how stormwater runoff will be managed at the development site in accordance with this Ordinance. **Stormwater Management Site Plan** will be designated as **SWM Site Plan** throughout this Ordinance.

Subdivision - As defined in The Pennsylvania Municipalities Planning Code, Act of July 31, 1968, P.L. 805, No. 247.

USDA - United States Department of Agriculture.

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

Watershed - Region or area drained by a river, watercourse, or other surface water of this Commonwealth.

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

ARTICLE III - STORMWATER MANAGEMENT STANDARDS

Section 301. General Requirements

A. For all regulated activities, unless preparation of an SWM Site Plan is specifically exempted in Section 302:

1. Preparation and implementation of an approved SWM Site Plan is required.

2. No regulated activities shall commence until the municipality issues written approval of an SWM Site Plan, which demonstrates compliance with the requirements of this Ordinance.

B. SWM Site Plans approved by the municipality, in accordance with Section 406, shall be on site throughout the duration of the regulated activity.

C. The municipality may, after consultation with DEP, approve measures for meeting the state water quality requirements other than those in this Ordinance, provided that they meet the minimum requirements of, and do not conflict with, state law including, but not limited to, the Clean Streams Law.

D. For all regulated earth disturbance activities, erosion and sediment control BMPs shall be designed, implemented, operated, and maintained during the regulated earth disturbance activities (e.g., during construction) to meet the purposes and requirements of this Ordinance and to meet all requirements under Title 25 of the Pennsylvania Code and the Clean Streams Law. Various BMPs and their design standards are listed in the *Erosion and Sediment Pollution Control Program Manual* (E&S Manual)[2], No. 363-2134-008 (April 15, 2000), as amended and updated.

E. For all regulated activities, implementation of the volume controls in Section 303 is required.

F. Impervious areas:

1. The measurement of impervious areas shall include all of the impervious areas in the total proposed development even if development is to take place in stages.

2. For development taking place in stages, the entire development plan must be used in determining conformance with this Ordinance.

3. For projects that add impervious area to a parcel, the total impervious area on the parcel is subject to the requirements of this Ordinance; except that the volume controls in Section 303 and the peak rate controls of Section 304 do not need to be retrofitted to existing impervious areas that are not being altered by the proposed regulated activity.

G. Stormwater flows onto adjacent property shall not be created, increased, decreased, relocated, or otherwise altered without written notification of the adjacent property owner(s). Such stormwater flows shall be subject to the requirements of this Ordinance.

H. All regulated activities shall include such measures as necessary to:

1. Protect health, safety, and property;

2. Meet the water quality goals of this Ordinance by implementing measures to:

   a. Minimize disturbance to floodplains, wetlands, and wooded areas.

   b. Maintain or extend riparian buffers.

   c. Avoid erosive flow conditions in natural flow pathways.

   d. Minimize thermal impacts to waters of this Commonwealth.

   e. Disconnect impervious surfaces by directing runoff to pervious areas, wherever possible.

3. To the maximum extent practicable, incorporate the techniques for Low Impact Development Practices described in the *Pennsylvania Stormwater Best Management Practices Manual* (BMP Manual)[1].

I. The design of all facilities over karst shall include an evaluation of measures to minimize adverse effects.

J. Infiltration BMPs should be spread out, made as shallow as practicable, and located to maximize use of natural on-site infiltration features while still meeting the other requirements of this Ordinance.

K. Normally dry, open top, storage facilities should completely drain both the volume control and rate control capacities over a period of time not less than 24 and not more than 72 hours from the end of the design storm.

L. Method of Computation- Peak discharge and runoff shall be computed using:

1. For drainage areas 0-5 acres, the recommended method of peak discharge runoff computation is the *Rational Method.* The design storm rainfall values to be used in the computations shall be in accordance with the PennDOT Drainage Manual, Publication 584, Chapter 7, Appendix A, as now or hereafter amended. Refer to Appendix E for the IDF maps and charts.
2. For drainage areas 5 acres to 0.5 square miles, the recommended method of peak discharge and runoff computation is the *Soil Cover Complex Method* as found in *Technical Release#55, Urban Hydrology for Small Watersheds,* as published by Soil Conservation Service, as now or hereafter amended. Refer to Appendix F for the Fayette County 24-Hour Rainfall Values.
3. For drainage areas larger than 0.5 square miles, the recommended method of peak discharge and runoff computation is *Procedure PSU-IV for Estimating Design Flood Peaks on Ungauged Pennsylvania Watersheds,* as developed by Pennsylvania State University, as now or hereafter amended.

M. The design storm volumes to be used in the analysis of peak rates of discharge should be obtained from the Precipitation-Frequency Atlas of the United States, Atlas 14, Volume 2, Version 3.0, U.S. Department of Commerce, National Oceanic and Atmospheric Administration

(NOAA), National Weather Service, Hydrometeorological Design Studies Center, Silver Spring, Maryland. NOAA's Atlas 14[5] can be accessed at: http://hdsc.nws.noaa.gov/hdsc/pfds/.

N. For all regulated activities, SWM BMPs shall be designed, implemented, operated, and maintained to meet the purposes and requirements of this Ordinance and to meet all requirements under Title 25 of the Pennsylvania Code, the Clean Streams Law, and the Storm Water Management Act.

O. Various BMPs and their design standards are listed in the BMP Manual[1].

Section 302. Exemptions

A. Regulated activities that create DIAs smaller than 1000 sq. ft. are exempt from the peak rate control and the SWM Site Plan preparation requirement of this Ordinance.

B. Regulated activities that create DIAs equal to or greater than 1000 sq. ft. and less than 5000 sq. ft. are exempt only from the peak rate control requirement of this Ordinance.

C. Agricultural activity is exempt from the rate control and SWM Site Plan preparation requirements of this Ordinance provided the activities are performed according to the requirements of 25 Pa. Code 102.

D. Forest management and timber operations are exempt from the rate control and SWM Site Plan preparation requirements of this Ordinance provided the activities are performed according to the requirements of 25 Pa. Code 102.

E. Single Family Residential Dwelling is exempt from providing SWM Plan if one of the identified BMPS is complied with, as provided for in Appendix C. If the property owner/developer chooses to select another BMP for a single family residential dwelling, then he/she shall follow the requirements of the SWM Plan as regulated in the Ordinance. Single Family Residential Dwellings are not exempt from inspections.

F. Exemptions from any provisions of this Ordinance shall not relieve the applicant from the requirements in Sections 301.D. through M.

Section 303. Volume Controls

The low impact development practices provided in the BMP Manual[1] shall be utilized for all regulated activities to the maximum extent practicable. Water volume controls shall be implemented using the *Design Storm Method* in Subsection A or the *Simplified Method* in Subsection B below. For regulated activity areas equal or less than 1 acre that do not require hydrologic routing to design the stormwater facilities, this Ordinance establishes no preference for either methodology; therefore, the applicant may select either methodology on the basis of economic considerations, the intrinsic limitations on applicability of the analytical procedures associated with each methodology, and other factors.

A. The *Design Storm Method* (CG-1 in the BMP Manual[1]) is applicable to any size of regulated activity. This method requires detailed modeling based on site conditions.

1. Do not increase the postdevelopment total runoff volume for all storms equal to or less than the 2-year 24-hour duration precipitation.

2. For modeling purposes:

   a. Existing (predevelopment) nonforested pervious areas must be considered meadow in good condition.

   b. 20% of existing impervious area, when present, shall be considered meadow in good condition in the model for existing conditions.

B. The *Simplified Method* (CG-2 in the BMP Manual[1]) provided below is independent of site conditions and should be used if the *Design Storm Method* is not followed. This method is not applicable to regulated activities greater than 1 acre or for projects that require design of stormwater storage facilities. For new impervious surfaces:

   1. Stormwater facilities shall capture at least the first 2 inches of runoff from all new impervious surfaces.

   2. At least the first 1 inch of runoff from new impervious surfaces shall be permanently removed from the runoff flow--i.e., it shall not be released into the surface waters of this Commonwealth. Removal options include reuse, evaporation, transpiration, and infiltration.

   3. Wherever possible, infiltration facilities should be designed to accommodate infiltration of the entire permanently removed runoff; however, in all cases at least the first 0.5 inch of the permanently removed runoff should be infiltrated.

   4. This method is exempt from the requirements of Section 304, Rate Controls.

Section 304. Rate Controls

A. Areas not covered by a release rate map from an approved Act 167 Stormwater Management Plan:

   Postdevelopment discharge rates shall not exceed the predevelopment discharge rates for the 2-, 10-, 25-, and 100-year 24-hour storms. If it is shown that the peak rates of discharge indicated by the postdevelopment analysis are less than or equal to the peak rates of discharge indicated by the predevelopment analysis for 2-, 10-, 25-, and 100-year, 24-hour storms, then the requirements of this section have been met. Otherwise, the applicant shall provide additional controls as necessary to satisfy the peak rate of discharge requirement.

B. Areas covered by a release rate map from an approved Act 167 Stormwater Management Plan:

   For the 2-, 10-, 25-, and 100-year storms, the postdevelopment peak discharge rates will follow the applicable approved release rate maps. For any areas not shown on the release rate maps, the postdevelopment discharge rates shall not exceed the predevelopment discharge rates.

   Refer to the attached Release Rate Control Map in Appendix D. The release rate for the Monongahela River Watershed is 55%, for the Youghiogheny River Watershed, the release rate is 80%, and for the Cheat River Watershed the release rate is 95%.

ARTICLE IV - STORMWATER MANAGEMENT (SWM) SITE PLAN REQUIREMENTS

Section 401. Plan Requirements

The following items shall be included in the SWM Site Plan:

A. Appropriate sections from the municipal's Subdivision and Land Development Ordinance, and other applicable local ordinances, shall be followed in preparing the SWM Site Plans. In instances where the municipality lacks Subdivision and Land Development regulations, the content of SWM Site Plans shall follow the county's Subdivision and Land Development Ordinance.

B. The municipality shall not approve any SWM Site Plan that is deficient in meeting the requirements of this Ordinance. At its sole discretion and in accordance with this Article, when a SWM Site Plan is found to be deficient, the municipality may either disapprove the submission and require a resubmission, or in the case of minor deficiencies, the municipality may accept submission of modifications.

C. Provisions for permanent access or maintenance easements for all physical SWM BMPs, such as ponds and infiltration structures, as necessary to implement the Operation and Maintenance (O&M) Plan discussed in Item H.9 below.

D. The following signature block for the municipality:

> "(Municipal official or designee), on this date (date of signature), has reviewed and hereby certifies that the SWM Site Plan meets all design standards and criteria of the Municipal Ordinance No. _____".

E. Indicate whether storm water will be managed on-site or off-site.

F. If the SWM Site Plan has been referred to comment to other interested agencies.

G. The SWM Site Plan must be signed by a licensed professional engineer (PE), who will verify that the design of all storm water management practices meet the submittal requirements.

H. The SWM Site Plan shall provide the following information:

1. The overall stormwater management concept for the project.

2. A determination of site conditions in accordance with the BMP Manual[1]. A detailed site evaluation shall be completed for projects proposed in areas of carbonate geology or karst topography, and other environmentally sensitive areas, such as brownfields.

3. Stormwater runoff design computations, and documentation as specified in this Ordinance, or as otherwise necessary to demonstrate that the maximum practicable measures have been taken to meet the requirements of this Ordinance, including the recommendations and general requirements in Section 301.

4. Expected project time schedule.

5. A soil erosion and sediment control plan, where applicable, as prepared for and submitted to the approval by the Fayette County Conservation District.

6. The effect of the project (in terms of runoff volumes, water quality, and peak flows) on surrounding properties and aquatic features and on any existing stormwater conveyance system that may be affected by the project.

7. Plan and profile drawings of all SWM BMPs, including drainage structures, pipes, open channels, and swales.

8. SWM Site Plan shall show the locations of existing and proposed on-lot wastewater facilities and water supply wells.

9. The SWM Site Plan shall include an O&M Plan for all existing and proposed physical stormwater management facilities. This plan shall address long-term ownership and responsibilities for O&M as well as schedules and costs for O&M activities.

10. For development or redevelopment occurring on a previously developed site, an applicant shall be required to include within the storm water management plan measures for controlling existing storm water runoff discharges from the site in accordance with the standards of this Ordinance to the maximum extent possible.

I. North Union Township may also require a concept plan to consider the maximum development potential of a site under existing zoning, regardless of whether the applicant presently intends to develop the site to its maximum potential.

Section 402. Plan Submission

A. Five (5) copies of the SWM Site Plan shall be submitted as follows:

1. ____ Two (2) copies to North Union Township.

2. ____ One (1) copy to the municipal engineer (submitted to North Union Township).

3. ____ One (1) copy to the Fayette County Conservation District.

4. ____ One (1) copy to the County Planning Commission/Office.

B. Additional copies shall be submitted as requested by the municipality or DEP.

Section 403. Plan Review

A. SWM Site Plans shall be reviewed by the municipality for consistency with the provisions of this Ordinance.

B. The municipality shall notify the applicant in writing within 45 days whether the SWM Site Plan is approved or disapproved. If the SWM Site Plan involves a Subdivision and Land Development Plan, the notification shall occur within the time period allowed by the Municipalities Planning Code (90 days). If a longer notification period is provided by other statute, regulation, or ordinance, the applicant will be so notified by the municipality.

C. If the municipality disapproves the SWM Site Plan, the municipality will state the reasons for the disapproval in writing. The municipality also may approve the SWM Site Plan with conditions and, if so, shall provide the acceptable conditions for approval in writing.

Section 404. Modification of Plans

A modification to a submitted SWM Site Plan that involves a change in SWM BMPs or techniques, or that involves the relocation or redesign of SWM BMPs, or that is necessary because soil or other conditions are not as stated on the SWM Site Plan as determined by the municipality shall require a resubmission of the modified SWM Site Plan in accordance with this Article.

Section 405. Resubmission of Disapproved SWM Site Plans

A disapproved SWM Site Plan may be resubmitted, with the revisions addressing the municipality's concerns, to the municipality in accordance with this Article. The applicable review fee must accompany a resubmission of a disapproved SWM Site Plan.

Section 406. Authorization to Construct and Term of Validity

The municipality's approval of an SWM Site Plan authorizes the regulated activities contained in the SWM Site Plan for a maximum term of validity of 5 years following the date of approval. The municipality may specify a term of validity shorter than 5 years in the approval for any specific SWM Site Plan. Terms of validity shall commence on the date the municipality signs the approval for an SWM Site Plan. If an approved SWM Site Plan is not completed according to Section 407 within the term of validity, then the municipality may consider the SWM Site Plan disapproved and may revoke any and all permits. SWM Site Plans that are considered disapproved by the municipality shall be resubmitted in accordance with Section 405 of this Ordinance.

Section 407. As-Built Plans, Completion Certificate, and Final Inspection

A. The developer shall be responsible for providing as-built plans of all SWM BMPs included in the approved SWM Site Plan. The as-built plans and an explanation of any discrepancies with the construction plans shall be submitted to the municipality.

B. The as-built submission shall include a certification of completion signed by a qualified professional verifying that all permanent SWM BMPs have been constructed according to the approved plans and specifications. If any licensed qualified professionals contributed to the construction plans, then a licensed qualified professional must sign the completion certificate.

C. After receipt of the completion certification by the municipality, the municipality may conduct a final inspection.

ARTICLE V - OPERATION AND MAINTENANCE

Section 501. Responsibilities of Developers and Landowners

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

B. Facilities, areas, or structures used as Stormwater Management BMPs shall be enumerated as permanent real estate appurtenances and recorded as deed restrictions or conservation easements that run with the land.

C. The O&M Plan shall be recorded as a restrictive deed covenant that runs with the land.

D. The municipality may take enforcement actions against an owner for any failure to satisfy the provisions of this Article.

Section 502. Operation and Maintenance Agreements

A. Prior to final approval of the SWM Site Plan, the property owner shall sign and record an Operation and Maintenance (O&M) Agreement (see Appendix A) covering all stormwater control facilities which are to be privately owned.

1. The owner, successor and assigns shall maintain all facilities in accordance with the approved maintenance schedule in the O&M Plan.

2. The owner shall convey to the Municipality conservation easements to assure access for periodic inspections by the Municipality and maintenance, as necessary.

3. The owner shall keep on file with the Municipality the name, address, and telephone number of the person or company responsible for maintenance activities; in the event of a change, new information shall be submitted by the owner to the Municipality within ten (10) working days of the change.

B. The owner is responsible for operation and maintenance (O&M) of the SWM BMPs. If the owner fails to adhere to the O&M Agreement, the municipality may perform the services required and charge the owner appropriate fees. Nonpayment of fees may result in a lien against the property.

Section 503. Performance Guarantee

For SWM Site Plans that involve subdivision and land development, the applicant shall provide a financial guarantee to the Municipality for the timely installation and proper construction of all stormwater management controls as required by the approved SWM Site Plan and this Ordinance in accordance with the provisions of Sections 509, 510, and 511 of the Pennsylvania Municipalities Planning Code.

The guarantee shall be accompanied by a bond from a surety company licensed to do business within the Commonwealth of Pennsylvania, or in the cash amount of the total estimated construction cost of the storm water management practices approved under permit, plus 10%. The performance security shall contain forfeiture provisions for failure to complete work specified in the SWM Plan. The guarantee and bond shall guarantee performance of the control measures for a period of five (5) years from final approval of the measures by the Engineer of North Union Township.

Any approval issued by the Engineer shall not be final until the guarantee has been received by North Union Township. North Union Township shall make the final inspection of the storm water practice to ensure that it is in compliance with the approved SWM Plan and the provisions of this Ordinance.

Section 504. Maintenance Guarantee

The Developer and landowner shall execute and submit a written maintenance guarantee to North Union Township, insuring the maintenance of all control measures, which guarantee shall be acceptable to the Solicitor of North Union Township, prior to any final approval of any work subject to the provisions of this Ordinance.

The guarantee shall be accompanied by a bond from a surety company licensed to do business within the Commonwealth of Pennsylvania, or cash in the amount that the Engineer of North Union Township deems adequate to cover all costs and expenses to maintain the control measures. The guarantee and bond shall guarantee maintenance of the control measures for a period of five (5) years from final approval of the measures by the Engineer of North Union Township. Any approval issued by the Engineer shall not be final until this guarantee has been received by North Union Township. North Union Township will make the final inspection of the storm water practice to ensure that it is in compliance with the approved plan and the provisions of this Ordinance.

Section 505. Maintenance by Private Entity

In cases where permanent control facilities are owned by a private entity, such entity shall be responsible for maintenance. In this case, a legally binding agreement between the entity and North Union Township shall be made providing for maintenance of all permanent control facilities, and allowing inspection by North Union Township of all such facilities deemed critical to the public welfare at any reasonable time. A proposed agreement shall be submitted to North Union Township for review and shall be subject to approval of the Solicitor of North Union Township.

Section 506. Maintenance by Individual Lot Owners

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

B. If North Union Township determines at any time that any permanent storm water management control facility has been eliminated, altered, or improperly maintained, the owner of the property shall be advised of corrective measures required and given a reasonable period of time to take necessary action. If such action is not taken by the property owner, North Union Township may cause work to be done and lien all costs and fee (including but not limited to legal fees) against the property owner.

Section 507. Township Action

Nothing in this ordinance shall obligate North Union Township to undertake corrective action, maintenance of control measures, or any other actions, expect to the extent North Union Township may be obligated to do so by any applicable law.

ARTICLE VI - FEES AND EXPENSES

Section 601. General

The municipality shall include all costs incurred in the review fee charged to an applicant.

The review fee may include, but not be limited to, costs for the following:

A. Administrative/clerical processing
B. Review of SWM Site Plan and Narrative
C. Stormwater Agreement fee (legal)
D. Inspections
E. Attendance at meetings

ARTICLE VII - PROHIBITIONS

Section 701. Prohibited Discharges and Connections

A. Any drain or conveyance, whether on the surface or subsurface, that allows any nonstormwater discharge including sewage, process wastewater, and wash water to enter the waters of this Commonwealth is prohibited.

B. No person shall allow, or cause to allow, discharges into surface waters of this Commonwealth which are not composed entirely of stormwater, except (1) as provided in Subsection C below and (2) discharges allowed under a state or federal permit.

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

- Discharges from firefighting activities	- Flows from riparian habitats and wetlands
- Potable water sources including water line flushing	- Uncontaminated water from foundations or from footing drains
- Irrigation drainage	- Lawn watering
- Air conditioning condensate	- Dechlorinated swimming pool discharges
- Springs	- Uncontaminated groundwater
- Water from crawl space pumps	- Water from individual residential car washing
- Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spill material has been removed) and where detergents are not used	- Routine external building wash down (which does not use detergents or other compounds)
Diverted stream flows	

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

Section 702. Roof Drains

Roof drains and sump pumps shall discharge to infiltration or vegetative BMPs and to the maximum extent practicable satisfy the criteria for DIAs.

Section 703. Alteration of SWM BMPs

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

ARTICLE VIII - ENFORCEMENT AND PENALTIES

Section 801. Right-of-Entry

Upon presentation of proper credentials, the municipality may enter at reasonable times upon any property within the municipality to inspect the condition of the stormwater structures and facilities in regard to any aspect regulated by this Ordinance.

Section 802. Inspection

SWM BMPs should be inspected by the landowner, or the owner's designee (including the municipality for dedicated and owned facilities), according to the following list of minimum frequencies:

1. Annually for the first 5 years.

2. Once every 3 years thereafter.

3. During or immediately after the cessation of a 10-year or greater storm.

Section 803. Enforcement

A. It shall be unlawful for a person to undertake any regulated activity except as provided in an approved SWM Site Plan, unless specifically exempted in Section 302.

B. It shall be unlawful to violate Section 703 of this Ordinance.

C. Inspections regarding compliance with the SWM Site Plan are a responsibility of the municipality.

Section 804. Suspension and Revocation

A. Any approval or permit issued by the municipality pursuant to this Ordinance may be suspended or revoked for:

1. Non-compliance with or failure to implement any provision of the approved SWM Site Plan or O&M Agreement.

2. A violation of any provision of this Ordinance or any other applicable law, ordinance, rule, or regulation relating to the Regulated Activity.

3. The creation of any condition or the commission of any act during the Regulated Activity which constitutes or creates a hazard, nuisance, pollution, or endangers the life or property of others.

B. When North Union Township determines that an activity is not being carried out in accordance with the requirements of this Ordinance, it shall issue a written notice of violation to the owners of the property. The notice of violation shall contain:
   1. The name and address of the owner or applicant.

2. The address, when available, or description of the building, structure or land upon which the violation is occurring.

3. A statement specifying the nature of the violation.

4. A description of the remedial measures necessary to bring the development activity into compliance with this Ordinance and a time schedule for completion of such remedial action.

5. A statement of the penalty or penalties that shall or may be assessed against the person whom the notice of violation is directed.

6. A statement that the determination of violation may be appealed to the municipality by filing a written notice of appeal within fifteen (15) days of service of the notice of the violation.

C. A suspended approval may be reinstated by the municipality when:

1. The municipality has inspected and approved the corrections to the violations that caused the suspension.

2. The municipality is satisfied that the violation has been corrected.

D. An approval that has been revoked by the municipality cannot be reinstated. The applicant may apply for a new approval under the provisions of this Ordinance.

E. If a violation causes no immediate danger to life, public health, or property, at its sole discretion, the municipality may provide a limited time period for the owner to correct the violation. In these cases, the municipality will provide the owner, or the owner's designee, with a written notice of the violation and the time period allowed for the owner to correct the violation. If the owner does not correct the violation within the allowed time period, the municipality may revoke or suspend any, or all, applicable approvals and permits pertaining to any provision of this Ordinance.

Section 805. Penalties

A. Anyone violating the provisions of this Ordinance shall be guilty of a summary offense, and upon conviction, shall be subject to a fine of not more than $ 600.00 for each violation, recoverable with costs. Each day that the violation continues shall be a separate offense and penalties shall be cumulative.

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

Section 806. Stop Work Order

Person receiving a notice of violation will be required to halt all construction activities. This "stop work order" will be in effect until North Union Township confirms that the development activities are in

compliance and the violation has been satisfactorily addressed. Failure to address a notice of violation in a timely manner can result in civil, criminal, or monetary penalties in accordance with enforcement measures authorized by this Ordinance.

Section 807. Appeals

A. Any person aggrieved by any action of the municipality or its designee, relevant to the provisions of this Ordinance, may appeal to the municipality within 30 days of that action.

B. Any person aggrieved by any decision of the municipality, relevant to the provisions of this Ordinance, may appeal to the Court of Common Pleas in the County of Fayette where the activity has taken place within 30 days of the municipality's decision.

ARTICLE IX - REFERENCES

1. Pennsylvania Department of Environmental Protection. No. 363-0300-002 (December 2006), as amended and updated. *Pennsylvania Stormwater Best Management Practices Manual*. Harrisburg, PA.

2. Pennsylvania Department of Environmental Protection. No. 363-2134-008 (April 15, 2000), as amended and updated. *Erosion and Sediment Pollution Control Program Manual.* Harrisburg, PA.

3. U.S. Department of Agriculture, National Resources Conservation Service (NRCS). *National Engineering Handbook.* Part 630: Hydrology, 1969-2001. Originally published as the *National Engineering Handbook*, Section 4: Hydrology. Available from the NRCS online at: http://www.nrcs.usda.gov/.

4. U.S. Department of Agriculture, Natural Resources Conservation Service. 1986. *Technical Release 55: Urban Hydrology for Small Watersheds*, 2nd Edition. Washington, D.C.

5. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, Hydrometeorological Design Studies Center. 2004-2006. *Precipitation-Frequency Atlas of the United States, Atlas 14*, Volume 2, Version 3.0, Silver Spring, Maryland. Internet address: http://hdsc.nws.noaa.gov/hdsc/pfds/.

(Ordinance Number) 4-2015

ENACTED and **ORDAINED** at a regular meeting of the

North Union Township Supervisors

on this 9th day of June, 2015.

This Ordinance shall take effect immediately.

Thomas Kumor — Chairman

Robert Tupta — Secretary

Curtis Matthews — Treasurer

ATTEST:

Robert Tupta
Secretary

APPENDIX A

OPERATION AND MAINTENANCE (O&M) AGREEMENT
STORMWATER MANAGEMENT BEST MANAGEMENT PRACTICES (SWM BMPs)

THIS AGREEMENT, made and entered into this _____ day of _____, 20___, by and between _____, (hereinafter the "Landowner"), and North Union Township, Fayette 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 SWM BMP Operation and Maintenance (O&M) Plan approved by the Municipality (hereinafter referred to as the "O&M 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 BMPs; 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 SWM BMPs be constructed and maintained on the Property; and

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

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

1. The Landowner shall construct the BMPs in accordance with the plans and specifications identified in the SWM Site Plan.

2. The Landowner shall operate and maintain the BMPs as shown on the SWM Plan in good working order in accordance with the specific operation and maintenance requirements noted on the approved O&M Plan.

3. The Landowner hereby grants permission to the Municipality, its authorized agents and employees, to enter upon the property, at reasonable times and upon presentation of proper credentials, to inspect the BMPs whenever 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 BMPs per paragraph 2, the Municipality or its representatives may enter upon the Property and take whatever action is deemed necessary to maintain said BMP(s). 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 invoice from the Municipality.

6. The intent and purpose of this Agreement is to ensure the proper maintenance of the onsite BMPs 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, shall release the Municipality 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.

8. The Municipality intends to inspect the BMPs at a minimum of once every three years to ensure their continued functioning.

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

ATTEST:

WITNESS the following signatures and seals:

(SEAL)

For the Municipality:

_____

For the Landowner:

_____

ATTEST:

North Union Township

County of Fayette, 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)**

APPENDIX B

DISCONNECTED IMPERVIOUS AREA (DIA)

B.1. Rooftop Disconnection

When rooftop downspouts are directed to a pervious area that allows for infiltration, filtration, and increased time of concentration, the rooftop may qualify as completely or partially DIA and a portion of the impervious rooftop area may be excluded from the calculation of total impervious area.

A rooftop is considered to be completely or partially disconnected if it meets the requirements listed below:

- The contributing area of rooftop to each disconnected discharge is 500 square feet or less, and
- The soil, in proximity of the roof water discharge area, is not designated as hydrologic soil group "D" or equivalent, and
- The overland flow path from roof water discharge area has a positive slope of 5% or less.

For designs that meet these requirements, the portion of the roof that may be considered disconnected depends on the length of the overland path as designated in Table B.1.

Table B.1: Partial Rooftop Disconnection

Length of Pervious Flow Path *	**Roof Area Treated as Disconnected**
(ft)	(% of contributing area)
0 – 14	0
15 – 29	20
30 – 44	40
45 – 59	60
60 – 74	80
75 or more	100

* Flow path cannot include impervious surfaces and must be at least 15 feet from any impervious surfaces.

B.2. Pavement Disconnection

When pavement runoff is directed to a pervious area that allows for infiltration, filtration, and increased time of concentration, the contributing pavement area may qualify as a DIA that may be excluded from the calculation of total impervious area. This applies generally only to small or narrow pavement structures such as driveways and narrow pathways through otherwise pervious areas (e.g., a walkway or bike path through a park).

Pavement is disconnected if the pavement, or area adjacent to the pavement, meets the requirements below:

- The contributing flow path over impervious area is not more than 75 feet, and
- The length of overland flow is greater than or equal to the contributing length, and
- The soil is not designated as hydrologic soil group "D" or equivalent, and
- The slope of the contributing impervious area is 5% or less, and
- The slope of the overland flow path is 5% or less.

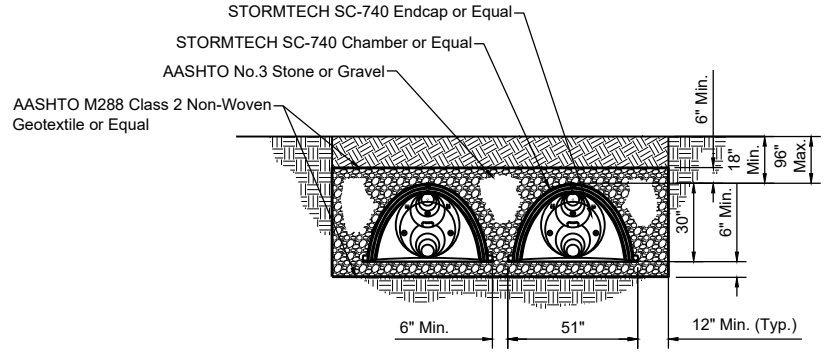
If the discharge is concentrated at one or more discrete points, no more than 1,000 square feet may discharge to any one point. In addition, a gravel strip or other spreading device is required for concentrated discharges. For nonconcentrated discharges along the edge of the pavement, this requirement is waived; however, there must be a provision for the establishment of vegetation along the pavement edge and temporary stabilization of the area until vegetation becomes stabilized.

REFERENCE

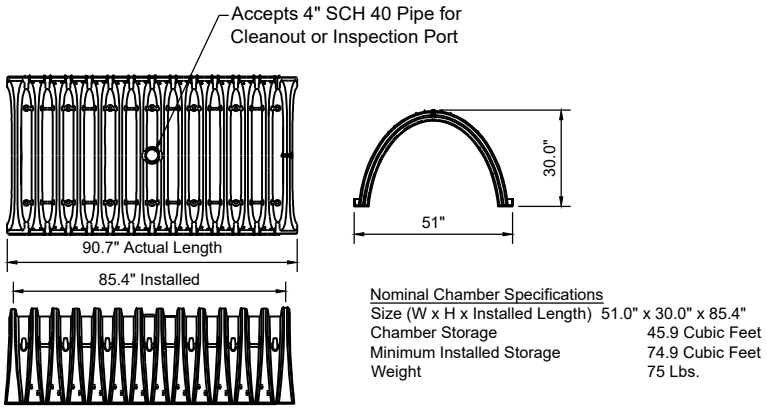
Philadelphia Water Department. 2006. *Stormwater Management Guidance Manual*. Section 4.2.2: Integrated Site Design. Philadelphia, PA.

APPENDIX C

BEST MANAGEMENT PRACTICES FOR SINGLE FAMILY DWELLING UNITS



CROSS SECTION
N.T.S.

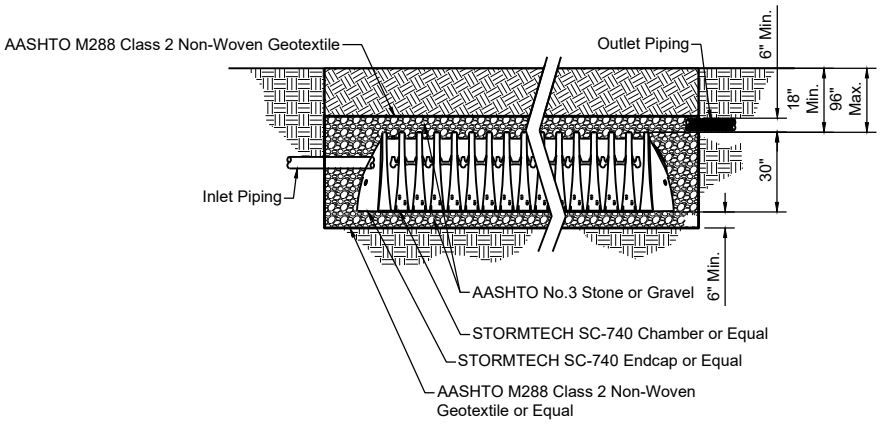


Nominal Chamber Specifications

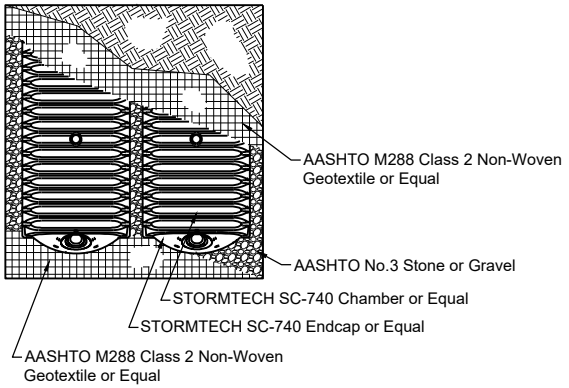
Size (W x H x Installed Length)	51.0" x 30.0" x 85.4"
Chamber Storage	45.9 Cubic Feet
Minimum Installed Storage	74.9 Cubic Feet
Weight	75 Lbs.

TECHNICAL SPECIFICATIONS
N.T.S.

Note:
Oulet pipe shall discharge to daylight.



PROFILE
N.T.S.



PLAN VIEW
N.T.S.

STORMWATER INFILTRATION CHAMBER DETAIL
SC-740

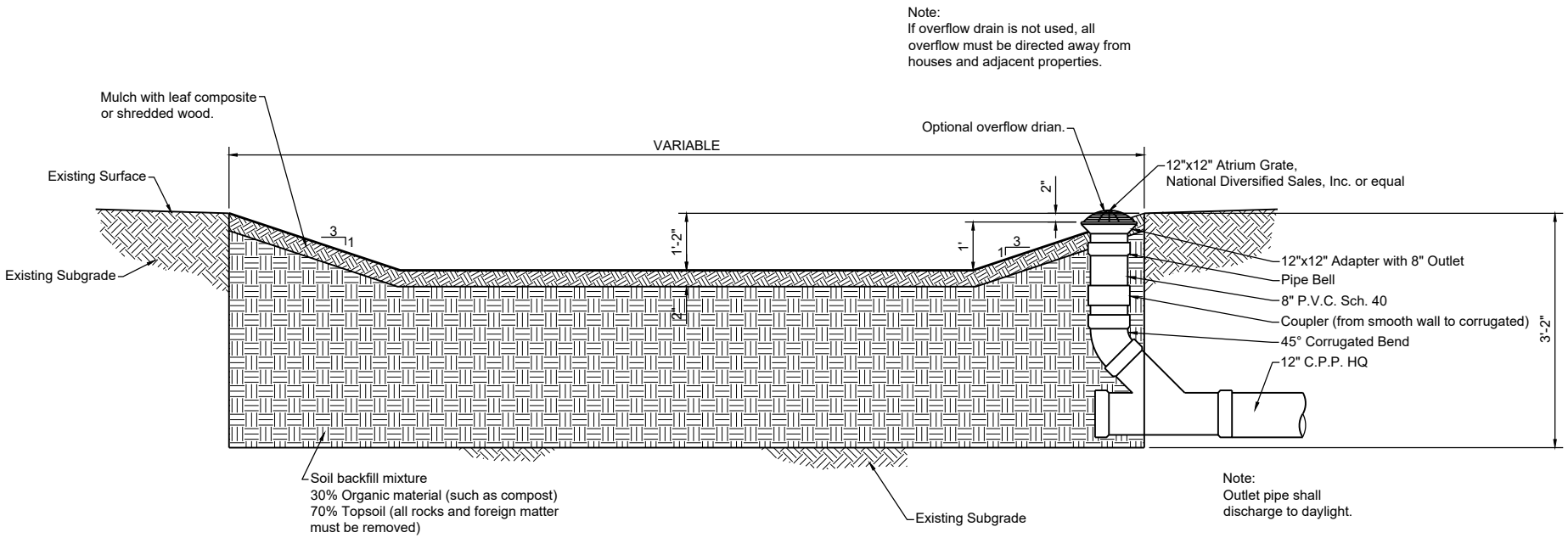
GENERAL NOTES

1. Stone placement between chambers rows and around perimeter must follow instructions as indicated in the most current version of STORMTECH's installation instructions.
2. Backfilling over the chambers must follow requirements as indicated in the most current version of STORMTECH's installation instructions.
3. AASHTO M288 Class 2 Non-Woven Geotextile (Filter Fabric) must be used.
4. The contractor must apply erosion and sediment control measures to protect the stormwater system during all phases of site construction per local codes and design engineer's specifications.
5. Contractor shall install (1) chamber per 500 sf of roof area for each lot.

Typical Rain Garden/Bioretention Area

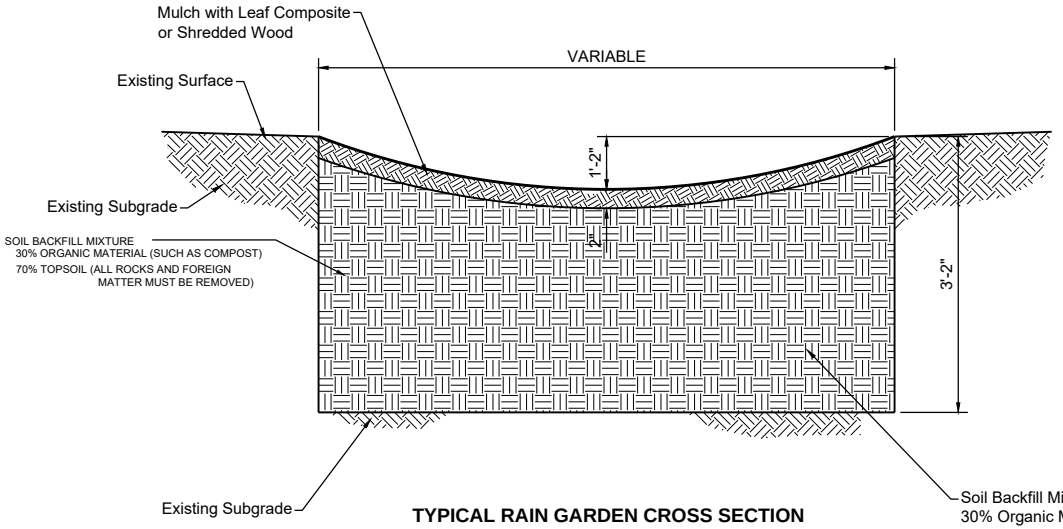
A Rain Garden (Bioretention Area) is an excavated depression area on the surface of the Land in which native vegetation is planted to filter and use stormwater runoff. Runoff pond o top of the surface of the rain garden and then infiltrates into an enhanced soil/planting mix below the surface where plants can use the water to grow. Bioretention also improves water quality, vegetation filters the water, and the root systems encourage or promote infiltration. The picture above shows a cross-section of a typical rain garden. Key elements of rain garden include:

- Ponding depths recommended to 1 foot or less.
- Native vegetation that can tolerate dry and wet weather.
- An overflow area where, if the bioretention area were to overflow, the overflow would flow over pervious area (i.e. grass, meadow), and would not cause harm to property, or;
- An overflow such as a domed riser to allow excess flow from large storms to travel to other substantial infiltration areas or pervious areas.
- Maximum side slopes of: 1 are recommended, however, where space is limited, 2:1 side slopes may be acceptable with approval from the municipal engineer.
- The soil/planting mix depth should be between 1.5 feet to 6 feet deep.
- Provide a storage volume of 8 cubic feet for every 100 square feet of impervious surface, (roof, pavement, gravel, etc.) that drains to the Rain Garden. Assume void space of 10% in the Soil/Planting Mix.



TYPICAL RAIN GARDEN PROFILE

N.T.S.



TYPICAL RAIN GARDEN CROSS SECTION

N.T.S.

GENERAL NOTES

1. Excavate rain garden area to depth of 3'-2" and scarify the existing soil surfaces. Do not compact existing surface.
2. Backfill rain garden with soil mixture, overfill to allowfor settlement. Light hand tamping is acceptable if necessary.
3. Presoak soil to aid in settlement, then complete grading to specified depth and add a layer of mulch.
4. Rain garden area shall be vegetated with native floodplain plant species.
5. Contractor shall install rain garden with a volume of 1,110 CU.FT. per acre of lot area.

Dry Well / Seepage Pit

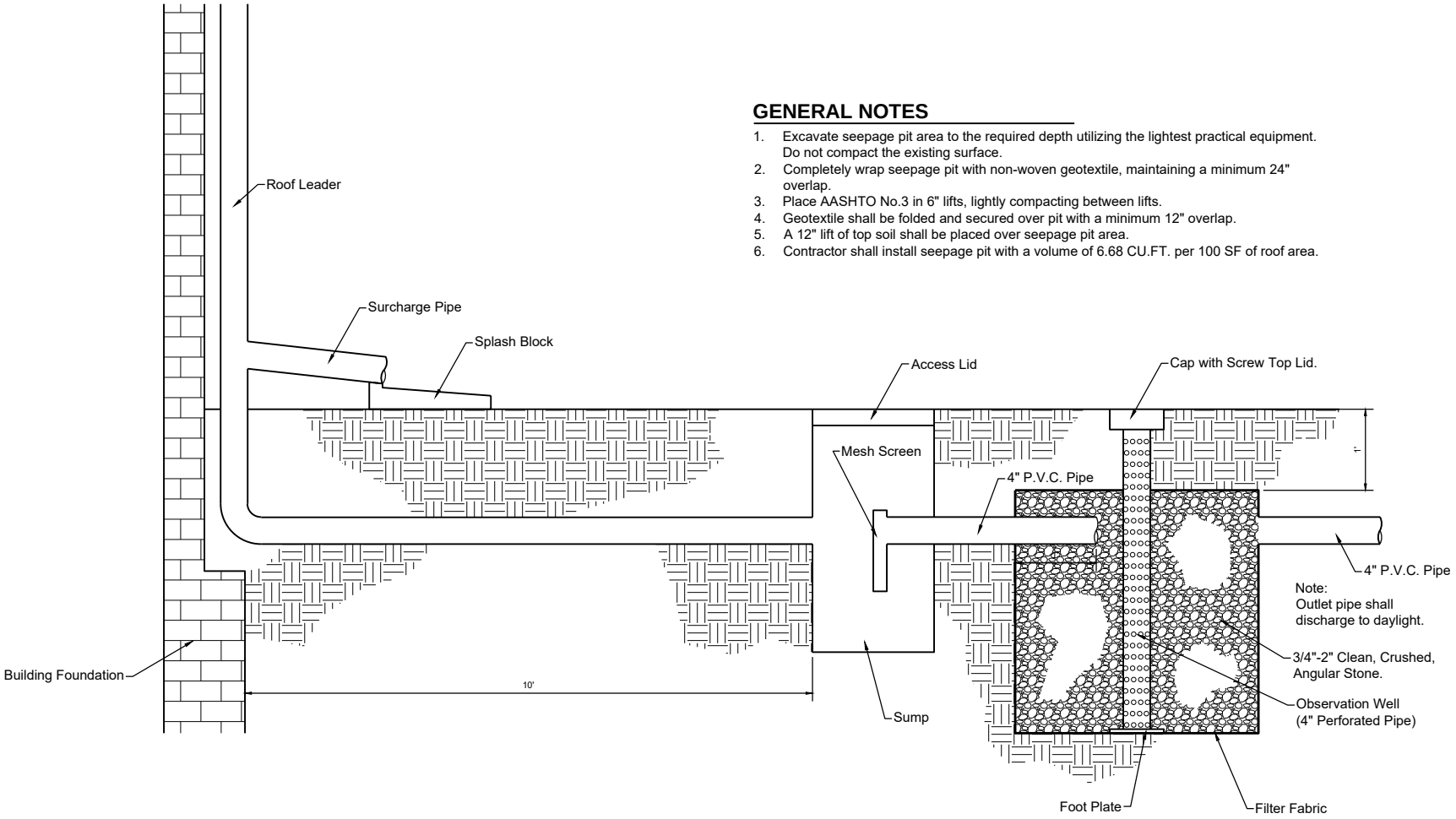
A dry well (or Seepage Pit) is a subsurface storage facility that temporarily stores and infiltrates runoff from the roofs of buildings or other impervious surfaces. A dry well can be either an excavated pit filled with stone fill, or a structural prefabricated chamber, (see illustrations below). Dry wells discharge the stored runoff via infiltration into the surrounding or underlying soils. An overflow mechanism (surcharge pipe, connection to larger infiltration area, etc.) will ensure that additional runoff is safely conveyed downstream. Key elements of a Dry Well include:

- Facilities should be located a minimum of ten (10) feet from building foundations.
- Construction of a dry well should be performed after surface soils in all other areas of the site are stabilized to avoid clogging.
- During construction, compaction of the subgrade soil in the bottom of the dry well should be avoided, and construction should be performed only with light machinery.
- Gravel fill should consist of stone with an average of 1-1/2 to 3 inches in diameter with the gravel fill wrapped in a nonwoven geotextile that separates the stone fill from the surrounding soil.
- At least 12 inches of soil needs to be placed over the top of the dry well, (18 inch minimum over prefabricated storage chambers).
- At least one observation well; cleanout is recommended
- Infiltration testing is recommended to ensure the underlying soil is capable of infiltrating the needed volume of the needed volume of stormwater.
- Maintenance with require periodic removal of sediment and leaves from sumps and cleanouts.
- Dry wells shall provide a storage volume of 8 cubic feet for every 100 square feet of impervious surface (roof, pavement, gravel, etc.) that drains to it.

Refer to the following illustrations of a typical seepage pit and prefabricated chamber.
Additional information is available in the Pennsylvania Stormwater Best Management Practices Manual.

GENERAL NOTES

1. Excavate seepage pit area to the required depth utilizing the lightest practical equipment. Do not compact the existing surface.
2. Completely wrap seepage pit with non-woven geotextile, maintaining a minimum 24" overlap.
3. Place AASHTO No.3 in 6" lifts, lightly compacting between lifts.
4. Geotextile shall be folded and secured over pit with a minimum 12" overlap.
5. A 12" lift of top soil shall be placed over seepage pit area.
6. Contractor shall install seepage pit with a volume of 6.68 CU.FT. per 100 SF of roof area.



TYPICAL SEEPAGE PIT DETAIL

N.T.S.

APPENDIX D

RELEASE RATE CONTROL MAP

LEGEND

- CHEAT RIVER WATERSHED 95% RELEASE RATE
- MONONGAHELA RIVER WATERSHED 55% RELEASE RATE
- YOUGHIOGHENY RIVER WATERSHED 80% RELEASE RATE
- SUB-WATERSHEDS
- TOWNSHIP BOUNDARY

NORTH UNION TOWNSHIP

mcmillen engineering
CIVIL ENGINEERS
LAND SURVEYORS
115 Wayland Smith Drive, Uniontown, PA 15401
Phone 724-439-8110 Fax 724-439-4733
Web Site www.mcmilleng.com
Email info@mcmilleng.com

REVISIONS

NO.	DESCRIPTION	DATE	BY
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NORTH UNION TOWNSHIP
STORMWATER MANAGEMENT ORDINANCE
PREPARED FOR
FAYETTE COUNTY
NORTH UNION TOWNSHIP, FAYETTE COUNTY, PENNSYLVANIA

TITLE
FAYETTE COUNTY RELEASE RATE MAP

BOOK NO.	JOB NO.
N/A	2015-24

DRAWN	MV 3-23-15	CHECKED	JS **
DESIGN	JS 3-23-15	APPROVED	TMJR **

SCALE: N.T.S.

SHEET NUMBER: **1**

APPENDIX E

PADOT DRAINAGE MANUAL, PUBLICATION 584, CHAPTER 7, APPENDIX A

CHAPTER 7, APPENDIX A

FIELD MANUAL FOR PENNSYLVANIA DESIGN RAINFALL INTENSITY CHARTS FROM NOAA ATLAS 14 VERSION 3 DATA

7A.0 INTRODUCTION

Previously used procedures to estimate design rainfall intensities, usually obtained from the *U.S. Weather Bureau Technical Paper No. 40* (Hershfield, 1961) or the *1986 Field Manual of PennDOT Storm-Intensity-Duration-Frequency Charts PDT-IDF* (Aron et al., 1986), have been updated in this appendix. The regional rainfall design curves in this Pennsylvania field manual were developed from frequency analyses based on hourly records from 278 daily and 139 hourly rainfall gages in Pennsylvania plus gages in surrounding states for a period of record from April 1, 1863 through December 31, 2000. The analysis leading to the design curves is fully described in this Appendix.

In performing the PDT-IDF analysis, it was found that there were regional differences in rainfall patterns between storm durations. For example, the lowest intensities and amounts for the five (5) minute storms are located in north central PA, whereas the lowest intensities and amounts for the twenty-four (24) hour storm are located in western PA. It was determined that one rainfall region map would not adequately represent the rainfall patterns. Therefore, the maps were developed based upon storm duration and frequency as shown in Table 7A.1.

7A.1 PROCEDURE FOR FINDING DESIGN INTENSITY VALUES

A. Objective. To obtain the design rainfall or return periods from 1 to 100-years and durations from 5 minutes to 24 hours and to obtain the 500-year, 24-hour precipitation.

Step 1 Determine the rainfall duration of the storm that will need to be analyzed. For the rational method, the required storm duration will be equal to the time-of-concentration.

Step 2 From Table 7A.1, determine what Rainfall Region Map should be utilized for the design storm duration of interest.

Table 7A.1 Appropriate Rainfall Region Map for each Storm Duration and Frequency

	Frequency							
Duration	**1 year**	**2 year**	**5 year**	**10 year**	**25 year**	**50 year**	**100 year**	**500 year**
5 min	C	C	C	C	B	B	B	-
10 min	C	C	C	C	C	C	C	-
15 min	A	A	A	A	C	C	C	-
30 min	A	A	A	A	A	C	C	-
60 min	A	A	A	A	A	C	C	-
2 hr	E	E	E	E	E	E	E	-
3 hr	E	E	E	E	E	E	E	-
6 hr	D	D	D	D	D	D	D	-
12 hr	F	F	F	F	F	F	F	-
24 hr	F	F	F	F	F	F	F	F

Step 3 Locate the area of interest on the Pennsylvania map for the Map determined in Step 2 (Figures 7A.1 through 7A.6) and note the region into which this area falls.

If a basin should be found to lie on the boundary between two regions, the intensities should be obtained from the two corresponding regional graphs and averaged. In the case that the basin is large enough to be divided into areas A_i and A_j of measurable size in the adjacent regions i and j, a weighted average intensity may be used.

$$I = \frac{I_i A_{i+} I_j A_j}{A_{i+} A_j}$$

Step 4 From the PDT-IDF curves for that region, determine the rainfall intensity.

The rainfall values for the five-minute through six (6) hour storms can be obtained directly from Tables 7A.2(a/b) through 7A.6(a/b) for each of the five regions or from interpolation from the PDT-IDF curves, Figures 7A.7(a/b) through 7A.16(a/b). For the twelve (12) and twenty-four (24) hour storms, the rainfall values can only be obtained directly from Tables 7A.2(a/b) through 7A.6(a/b) for each of the five regions.

Table 7A.2(a) Five (5) minute through twenty-four (24) hour storm totals for Region 1 (Metric).

Region 1								
Rainfall Total								
	1-Yr Storm	2-Yr Storm	5-Yr Storm	10-Yr Storm	25-Yr Storm	50-Yr Storm	100-Yr Storm	500-Yr Storm
Duration (Min)	cm	cm	cm	cm	cm	cm	cm	cm
5	0.70	0.83	1.00	1.13	1.29	1.39	1.47	
10	1.09	1.30	1.56	1.75	1.97	2.11	2.22	
15	1.34	1.59	1.91	2.15	2.44	2.61	2.76	
30	1.77	2.13	2.63	2.99	3.45	3.73	3.99	
60	2.16	2.62	3.30	3.81	4.48	4.92	5.33	
120	2.52	3.03	3.79	4.41	5.28	5.98	6.64	
180	2.77	3.32	4.15	4.82	5.80	6.55	7.34	
360	3.49	4.17	5.17	6.02	7.22	8.11	9.04	
720	4.30	5.14	6.33	7.38	8.93	10.09	11.32	
1440	5.18	6.19	7.59	8.74	10.40	11.80	13.30	17.11

Table 7A.2(b) Five (5) minute through twenty-four (24) hour storm totals for Region 1 (U.S. Customary).

Region 1								
Rainfall Total								
	1-Yr Storm	2-Yr Storm	5-Yr Storm	10-Yr Storm	25-Yr Storm	50-Yr Storm	100-Yr Storm	500-Yr Storm
Duration (Min)	in	in	in	in	in	in	in	in
5	0.28	0.33	0.39	0.45	0.51	0.55	0.58	
10	0.43	0.51	0.61	0.69	0.78	0.83	0.87	
15	0.53	0.63	0.75	0.85	0.96	1.03	1.09	
30	0.70	0.84	1.03	1.18	1.36	1.47	1.57	
60	0.85	1.03	1.30	1.50	1.76	1.94	2.10	
120	0.99	1.19	1.49	1.74	2.08	2.35	2.62	
180	1.09	1.31	1.63	1.90	2.28	2.58	2.89	
360	1.37	1.64	2.04	2.37	2.84	3.19	3.56	
720	1.69	2.02	2.49	2.91	3.52	3.97	4.46	
1440	2.04	2.44	2.99	3.44	4.09	4.65	5.24	6.74

Table 7A.3(a) Five (5) minute through twenty-four (24) hour storm totals for Region 2 (Metric).

Region 2								
Rainfall Total								
	1-Yr Storm	2-Yr Storm	5-Yr Storm	10-Yr Storm	25-Yr Storm	50-Yr Storm	100-Yr Storm	500-Yr Storm
Duration (Min)	cm	cm	cm	cm	cm	cm	cm	cm
5	0.76	0.91	1.08	1.22	1.40	1.52	1.63	
10	1.18	1.42	1.68	1.88	2.14	2.31	2.46	
15	1.45	1.73	2.07	2.32	2.65	2.86	3.06	
30	1.93	2.32	2.84	3.23	3.75	4.10	4.43	
60	2.36	2.87	3.60	4.15	4.88	5.40	5.93	
120	2.77	3.35	4.19	4.87	5.82	6.60	7.46	
180	3.05	3.67	4.59	5.34	6.41	7.29	8.27	
360	3.83	4.60	5.73	6.68	8.03	9.07	10.17	
720	4.73	5.67	7.01	8.20	9.97	11.36	12.84	
1440	5.68	6.80	8.37	9.70	11.67	13.40	15.32	20.70

Table 7A.3(b). Five (5) minute through twenty-four (24) hour storm totals for Region 2 (U.S. Customary).

Region 2								
Rainfall Total								
	1-Yr Storm	2-Yr Storm	5-Yr Storm	10-Yr Storm	25-Yr Storm	50-Yr Storm	100-Yr Storm	500-Yr Storm
Duration (Min)	in	in	in	in	in	in	in	in
5	0.30	0.36	0.43	0.48	0.55	0.60	0.64	
10	0.47	0.56	0.66	0.74	0.84	0.91	0.97	
15	0.57	0.68	0.81	0.91	1.04	1.13	1.20	
30	0.76	0.92	1.12	1.27	1.47	1.61	1.74	
60	0.93	1.13	1.42	1.63	1.92	2.13	2.33	
120	1.09	1.32	1.65	1.92	2.29	2.60	2.94	
180	1.20	1.45	1.81	2.10	2.52	2.87	3.25	
360	1.51	1.81	2.26	2.63	3.16	3.57	4.00	
720	1.86	2.23	2.76	3.23	3.92	4.47	5.06	
1440	2.24	2.68	3.30	3.82	4.60	5.27	6.03	8.15

Table 7A.4(a) Five (5) minute through twenty-four (24) hour storm totals for Region 3 (Metric).

Region 3								
Rainfall Total								
	1-Yr Storm	2-Yr Storm	5-Yr Storm	10-Yr Storm	25-Yr Storm	50-Yr Storm	100-Yr Storm	500-Yr Storm
Duration (Min)	cm	cm	cm	cm	cm	cm	cm	cm
5	0.82	0.98	1.16	1.30	1.50	1.65	1.79	
10	1.28	1.53	1.81	2.02	2.31	2.51	2.70	
15	1.57	1.88	2.22	2.49	2.85	3.11	3.36	
30	2.08	2.51	3.06	3.48	4.04	4.46	4.87	
60	2.56	3.11	3.89	4.48	5.27	5.88	6.53	
120	3.03	3.66	4.59	5.33	6.37	7.23	8.27	
180	3.33	4.02	5.03	5.85	7.02	8.03	9.19	
360	4.17	5.02	6.29	7.34	8.84	10.03	11.30	
720	5.16	6.19	7.69	9.02	11.00	12.62	14.37	
1440	6.19	7.42	9.16	10.66	12.94	14.99	17.35	24.30

Table 7A.4(b). Five (5) minute through twenty-four (24) hour storm totals for Region 3 (U.S. Customary).

Region 3								
Rainfall Total								
	1-Yr Storm	2-Yr Storm	5-Yr Storm	10-Yr Storm	25-Yr Storm	50-Yr Storm	100-Yr Storm	500-Yr Storm
Duration (Min)	in	in	in	in	in	in	in	in
5	0.32	0.39	0.46	0.51	0.59	0.65	0.71	
10	0.50	0.60	0.71	0.80	0.91	0.99	1.06	
15	0.62	0.74	0.88	0.98	1.12	1.22	1.32	
30	0.82	0.99	1.20	1.37	1.59	1.75	1.92	
60	1.01	1.23	1.53	1.77	2.08	2.32	2.57	
120	1.19	1.44	1.81	2.10	2.51	2.85	3.26	
180	1.31	1.58	1.98	2.30	2.77	3.16	3.62	
360	1.64	1.98	2.48	2.89	3.48	3.95	4.45	
720	2.03	2.44	3.03	3.55	4.33	4.97	5.66	
1440	2.44	2.92	3.61	4.20	5.10	5.90	6.83	9.57

Table 7A.5(a) Five (5) minute through twenty-four (24) hour storm totals for Region 4 (Metric).

Region 4								
Rainfall Total								
	1-Yr Storm	2-Yr Storm	5-Yr Storm	10-Yr Storm	25-Yr Storm	50-Yr Storm	100-Yr Storm	500-Yr Storm
Duration (Min)	cm	cm	cm	cm	cm	cm	cm	cm
5	0.89	1.06	1.24	1.39	1.61	1.78	1.95	
10	1.38	1.65	1.93	2.16	2.47	2.71	2.95	
15	1.69	2.02	2.38	2.66	3.06	3.36	3.66	
30	2.24	2.71	3.28	3.72	4.34	4.82	5.31	
60	2.76	3.36	4.18	4.82	5.67	6.36	7.12	
120	3.28	3.98	4.99	5.80	6.91	7.85	9.09	
180	3.61	4.36	5.47	6.37	7.64	8.77	10.11	
360	4.50	5.45	6.85	7.99	9.65	10.99	12.43	
720	5.59	6.72	8.37	9.84	12.03	13.88	15.89	
1440	6.69	8.03	9.94	11.61	14.21	16.59	19.38	27.89

Table 7A.5(b). Five (5) minute through twenty-four (24) hour storm totals for Region 4 (U.S. Customary).

Region 4								
Rainfall Total								
	1-Yr Storm	2-Yr Storm	5-Yr Storm	10-Yr Storm	25-Yr Storm	50-Yr Storm	100-Yr Storm	500-Yr Storm
Duration (Min)	in	in	in	in	in	in	in	in
5	0.35	0.42	0.49	0.55	0.63	0.70	0.77	
10	0.54	0.65	0.76	0.85	0.97	1.07	1.16	
15	0.67	0.79	0.94	1.05	1.21	1.32	1.44	
30	0.88	1.07	1.29	1.47	1.71	1.90	2.09	
60	1.09	1.32	1.65	1.90	2.23	2.51	2.80	
120	1.29	1.57	1.96	2.28	2.72	3.09	3.58	
180	1.42	1.72	2.16	2.51	3.01	3.45	3.98	
360	1.77	2.14	2.70	3.15	3.80	4.33	4.89	
720	2.20	2.65	3.29	3.87	4.74	5.46	6.26	
1440	2.64	3.16	3.91	4.57	5.60	6.53	7.63	10.98

Table 7A.6(a) Five (5) minute through twenty-four (24) hour storm totals for Region 5 (Metric).

Region 5								
Rainfall Total								
	1-Yr Storm	2-Yr Storm	5-Yr Storm	10-Yr Storm	25-Yr Storm	50-Yr Storm	100-Yr Storm	500-Yr Storm
Duration (Min)	cm	cm	cm	cm	cm	cm	cm	cm
5	0.95	1.13	1.32	1.48	1.72	1.91	2.11	
10	1.47	1.76	2.06	2.29	2.64	2.91	3.19	
15	1.81	2.16	2.53	2.82	3.27	3.61	3.96	
30	2.40	2.90	3.49	3.97	4.63	5.18	5.76	
60	2.96	3.61	4.47	5.15	6.06	6.84	7.72	
120	3.54	4.30	5.39	6.26	7.45	8.48	9.90	
180	3.90	4.71	5.92	6.89	8.25	9.51	11.03	
360	4.84	5.87	7.40	8.65	10.46	11.95	13.56	
720	6.02	7.25	9.04	10.66	13.07	15.14	17.42	
1440	7.20	8.64	10.73	12.57	15.49	18.19	21.40	31.49

Table 7A.6(b). Five (5) minute through twenty-four (24) hour storm totals for Region 5 (U.S. Customary).

Region 5								
Rainfall Total								
	1-Yr Storm	2-Yr Storm	5-Yr Storm	10-Yr Storm	25-Yr Storm	50-Yr Storm	100-Yr Storm	500-Yr Storm
Duration (Min)	in	in	in	in	in	in	in	in
5	0.37	0.45	0.52	0.58	0.68	0.75	0.83	
10	0.58	0.69	0.81	0.90	1.04	1.15	1.26	
15	0.71	0.85	1.00	1.11	1.29	1.42	1.56	
30	0.94	1.14	1.37	1.56	1.82	2.04	2.27	
60	1.17	1.42	1.76	2.03	2.39	2.69	3.04	
120	1.39	1.69	2.12	2.46	2.93	3.34	3.90	
180	1.53	1.86	2.33	2.71	3.25	3.75	4.34	
360	1.91	2.31	2.91	3.40	4.12	4.70	5.34	
720	2.37	2.86	3.56	4.20	5.15	5.96	6.86	
1440	2.83	3.40	4.22	4.95	6.10	7.16	8.43	12.40

1. Example. Determine the 10-year rainfall intensity for a drainage area in eastern Schuylkill County that has a time-of-concentration (T_c) of 12 minutes.

Step 1 The duration would be equal to the time-of-concentration or 12 minutes

Step 2 Since 12 minutes is less than half way between the midpoint between the 10- and 15-minute increment in Table 7A.1, the Map corresponding to the 10-minute duration would be utilized, or Map C. If the T_c value falls between values shown in Table 7A.1, one should round to the nearest value in the Table. For example, if a 14-minute T_c was obtained, the map shown for the 15-minute duration should be utilized, or Map A. A value of 12.5 would also be rounded to 15 minutes and Map A chosen. Note that rounding is only necessary for map determination. The original T_c value should be utilized to obtain the rainfall intensity.

Step 3 From Map C, the site would fall in Region 4.

Step 4 From the PDT-IDF curve for Region 4, the 10-year, 12-minute storm would be 12.2 cm per hour (4.8 in per hour).

NOTE: EQUATION 7.9 FOR THE RATIONAL METHOD IN METRIC UNITS USES mm/hr AS THE RAINFALL UNIT, NOT cm/hr. CHARTS IN APPENDIX 7A ARE IN UNITS OF cm/hr. THE RAINFALL INTENSITIES DERIVED FROM APPENDIX 7A WILL NEED TO BE CONVERTED FROM cm/hr TO mm/hr FOR USE IN THE RATIONAL METHOD, METRIC UNITS.

B. Composite Design Storms. In storm runoff modeling, design storms are often needed which are not only appropriate for the entire watershed, but for individual subareas as well. Design storms are typically classified by Average Recurrence Interval (ARI), which is established based upon the frequency of an event or how often an event is statistically likely to occur. The ARI is inversely equivalent to the probability that an event will occur in any given year. For instance, a 100-storm is inversely equivalent to 0.01 which means this event has a 1% chance of occurring in any given year. Similarly, the 25-year storm has is inversely equivalent to 0.04 which means this event has a 4% probability of occurring in any given year. A complete design storm, constructed as described below, will demonstrate the procedures used to obtain precipitation estimates for a given ARI which can then be used for design and analysis.

The composite design storm should be generated such that the maximum rain falling over any time span (centered around the storm peak), equals the design storm depth indicated for the corresponding durations.

As an example, a 10-year design storm for the same site will be constructed for a location in Map C, Region 4 for the 10-minute duration and Map A, Region 5 for the 20 through 80 minute durations. The storm is to be defined in 10-minute intervals, for a total duration of 80 minutes. The storm peak shall be placed at or right after the center of the storm and that the storm shape be approximately symmetrical.

Step 1 From Figures 7A.13(b) and 7A.14(b), obtain 10-year rainfall amounts for the 10 minute duration and from Figures 7A.15(b) and 7A.16(b), obtain 10-year rainfall amounts for the 20-… 80-minute durations (the appropriate map and region), and list them as in column (2) in Tables 7A.7(a) and 7A.7(b).

Step 2 Compute the incremental rainfall amounts between consecutive durations. Enter into column (3).

Step 3 Rearrange the rainfall increments from column (3) to column (4) in a quasi-symmetrical pattern, moving first and largest storm interval time to 40-50 minutes, the second to 30-40 minutes, the third to 50-60 minutes and so forth.

Step 4 Compute the rain intensities during the time increments, dividing column (4) by the time step (10 minutes) and multiplying by 60 minutes. Enter the intensities into column (5) and plot the hyetograph.

Table 7A.7(a) Composite 10-year storm in Region 5 (Metric).

(1) Storm duration (minutes) and Map	(2) Rainfall amount (cm)	(3) Rainfall increments (cm)	(4) Rearranged rainfall inc. (cm)	(5) Rearranged rainfall int. (cm/hour)
0	0.00			
		2.16	0.14	0.90
10 Map C*	2.16			
		1.02	0.35	2.10
20 Map A	3.18			
		0.79	0.42	2.52
30 Map A	3.97			
		0.42	1.02	6.12
40 Map A	4.39			
		0.41	2.16	12.96
50 Map A	4.80			
		0.35	0.79	4.74
60 Map A	5.15			
		0.29	0.41	2.46
70 Map A	5.44			
		0.14	0.29	1.74
80 Map A	5.58			

* For region 4

Table 7A.7(b). Composite 10-year storm in Region 5 (U.S. Customary).

(1) Storm duration (minutes) and Map	(2) Rainfall amount (in)	(3) Rainfall increments (in)	(4) Rearranged rainfall inc. (in)	(5) Rearranged rainfall int. (in/hour)
0	0.00			
		0.85	0.06	0.36
10 Map C*	0.85			
		0.40	0.14	0.84
20 Map A	1.25			
		0.31	0.17	1.02
30 Map A	1.56			
		0.17	0.40	2.40
40 Map A	1.73			
		0.16	0.85	5.10
50 Map A	1.89			
		0.14	0.31	1.86
60 Map A	2.03			
		0.11	0.16	0.96
70 Map A	2.14			
		0.06	0.11	0.66
80 Map A	2.20			

* For region 4

Figure 7A.1 Map A. 15-, 30- and 60-minute durations for storms occurring with an ARI of 1-, 2-, 5-, 10-years and 30- and 60-minute durations for storms occurring with an ARI of 25-years.

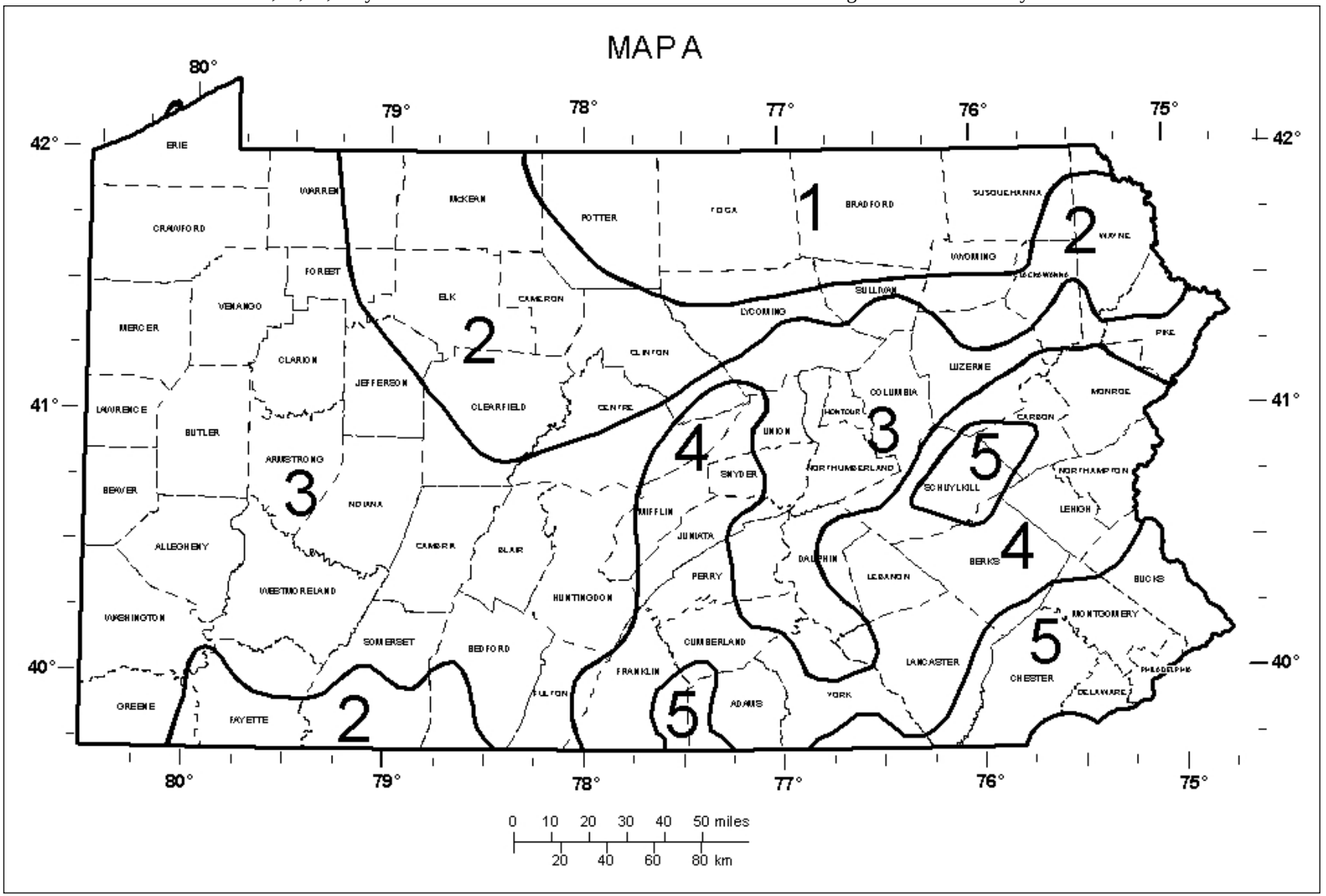


Figure 7A.2 Map B. 5-minute durations for storms occurring with an ARI of 25-, 50- and 100-years.

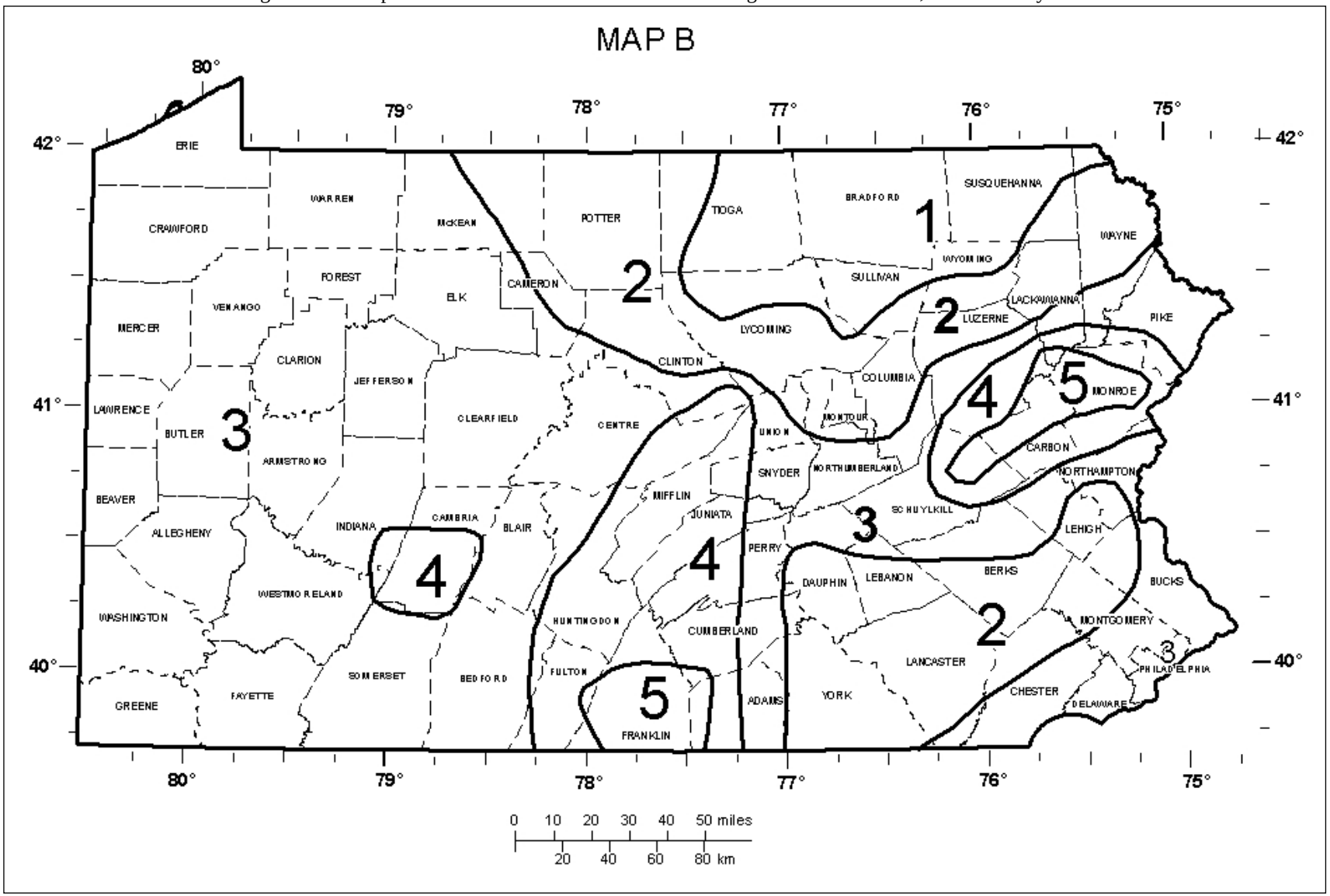


Figure 7A.3 Map C. 5- and 10-minute durations for storms occurring with an ARI of 1-, 2-, 5-, and 10-years, 10- and 15-minute durations for storms occurring with an ARI of 25-years and 10-, 15-, 30-, 60-minute durations for storms occurring with an ARI of 50- and 100-years.

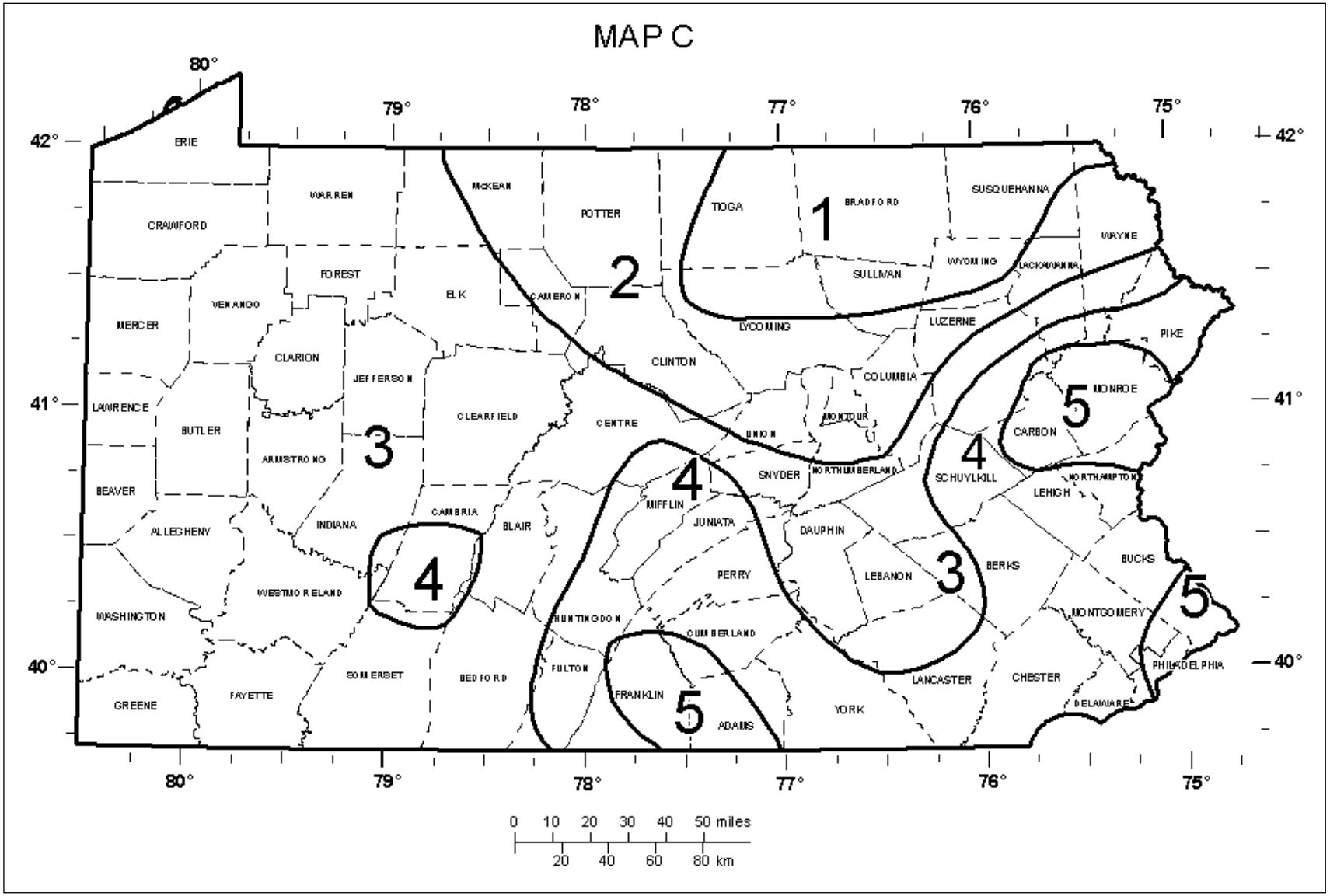


Figure 7A.4 Map D. 6-hour durations for storms occurring with an ARI of 1-, 2-, 5-, 10-, 25-, 50- and 100-years.

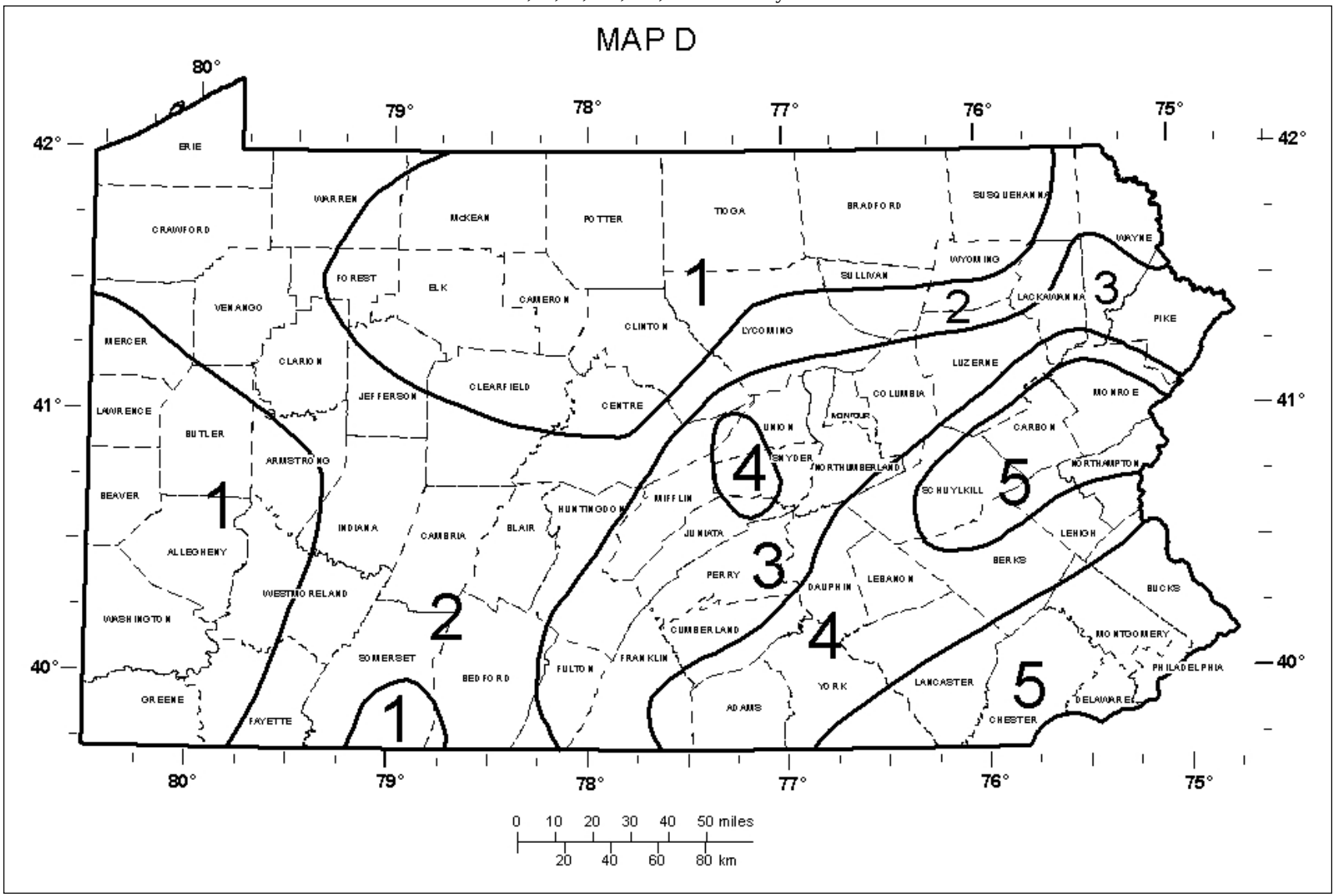


Figure 7A.5 Map E. 2- and 3-hour durations for storms occurring with an ARI of 1-, 2-, 5-, 10-, 25-, 50- and 100-years.

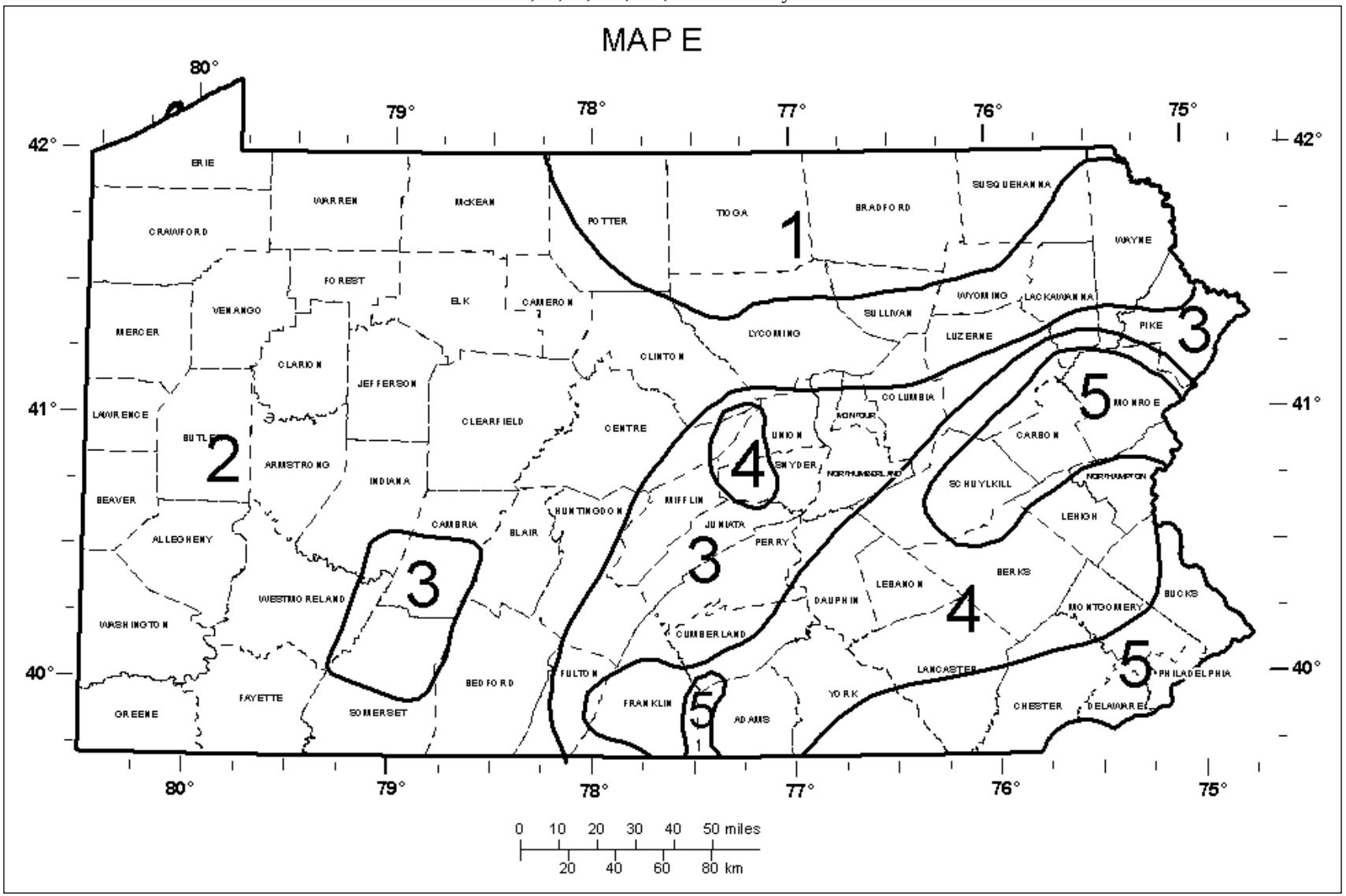


Figure 7A.6 Map F. 12- and 24-hour durations for storms occurring with an average recurrence interval (ARI) of 1-, 2-, 5-, 10-, 25-, 50-, and 100-years and the 24-hour duration for the 500-year frequency storm.

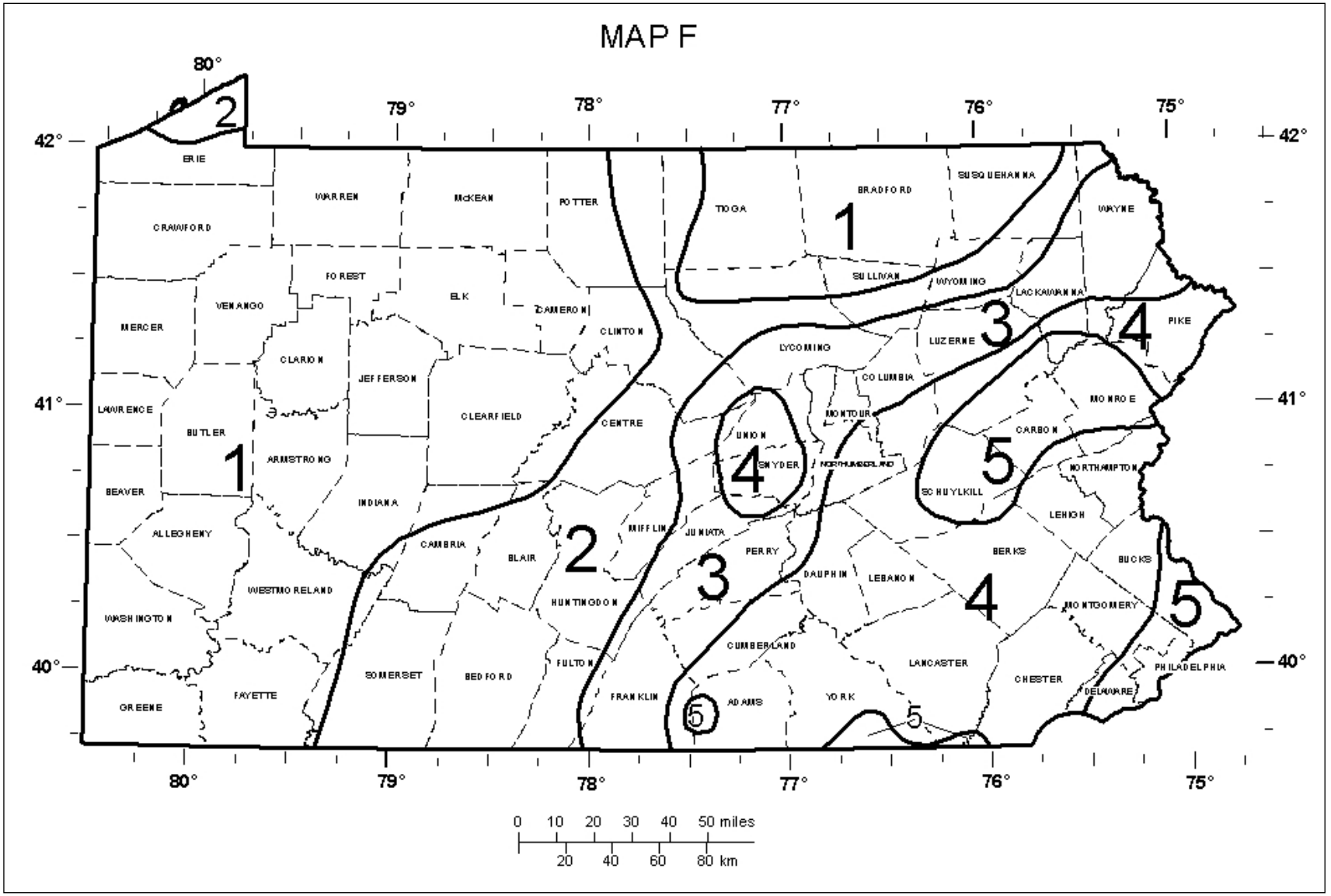


Figure 7A.7(a) Rainfall Intensity for 1- through 100-year Storms for Region 1 (Metric).

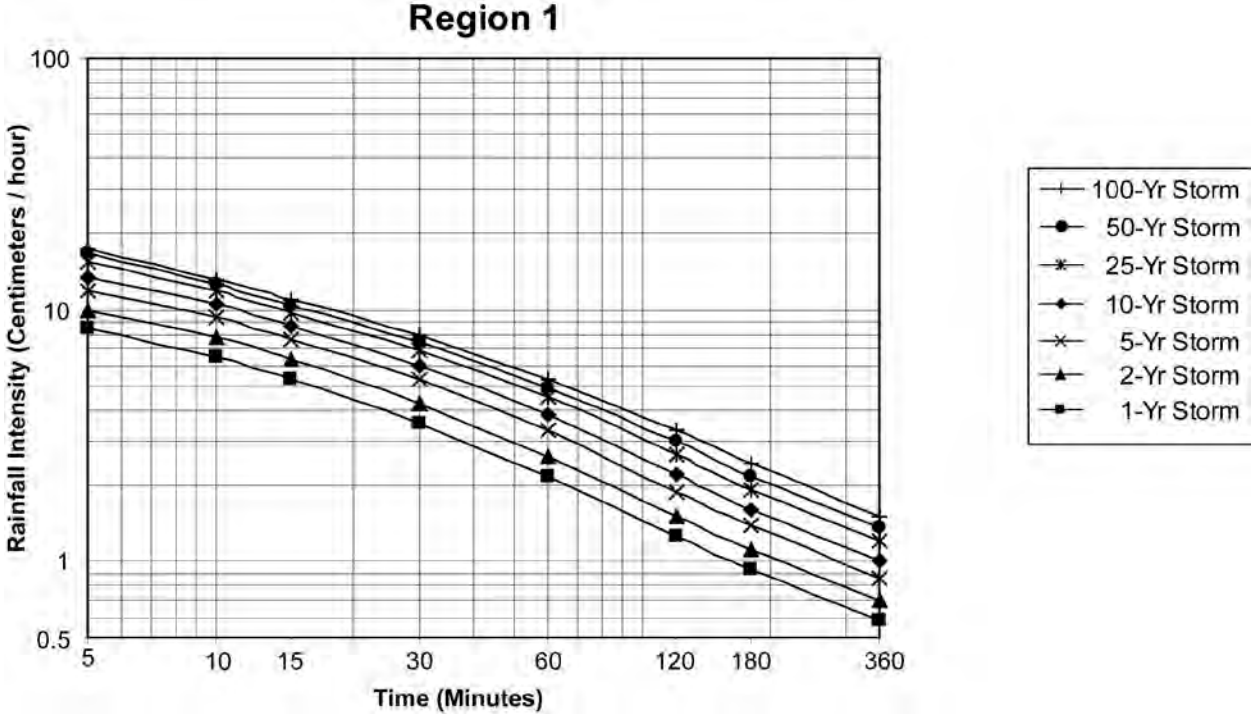


Figure 7A.7(b) Rainfall Amount for 1- through 100-year Storms for Region 1 (Metric).

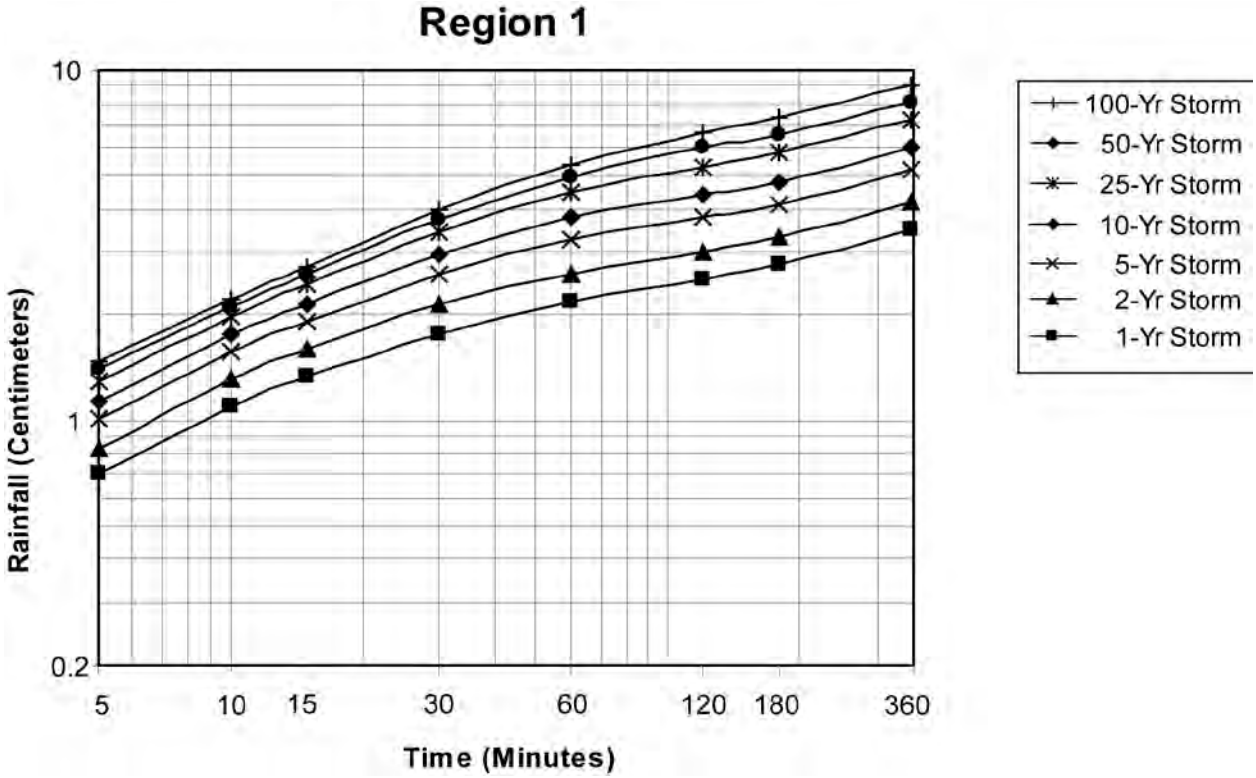


Figure 7A.8(a) Rainfall Intensity for 1- through 100-year Storms for Region 1 (U.S. Customary).

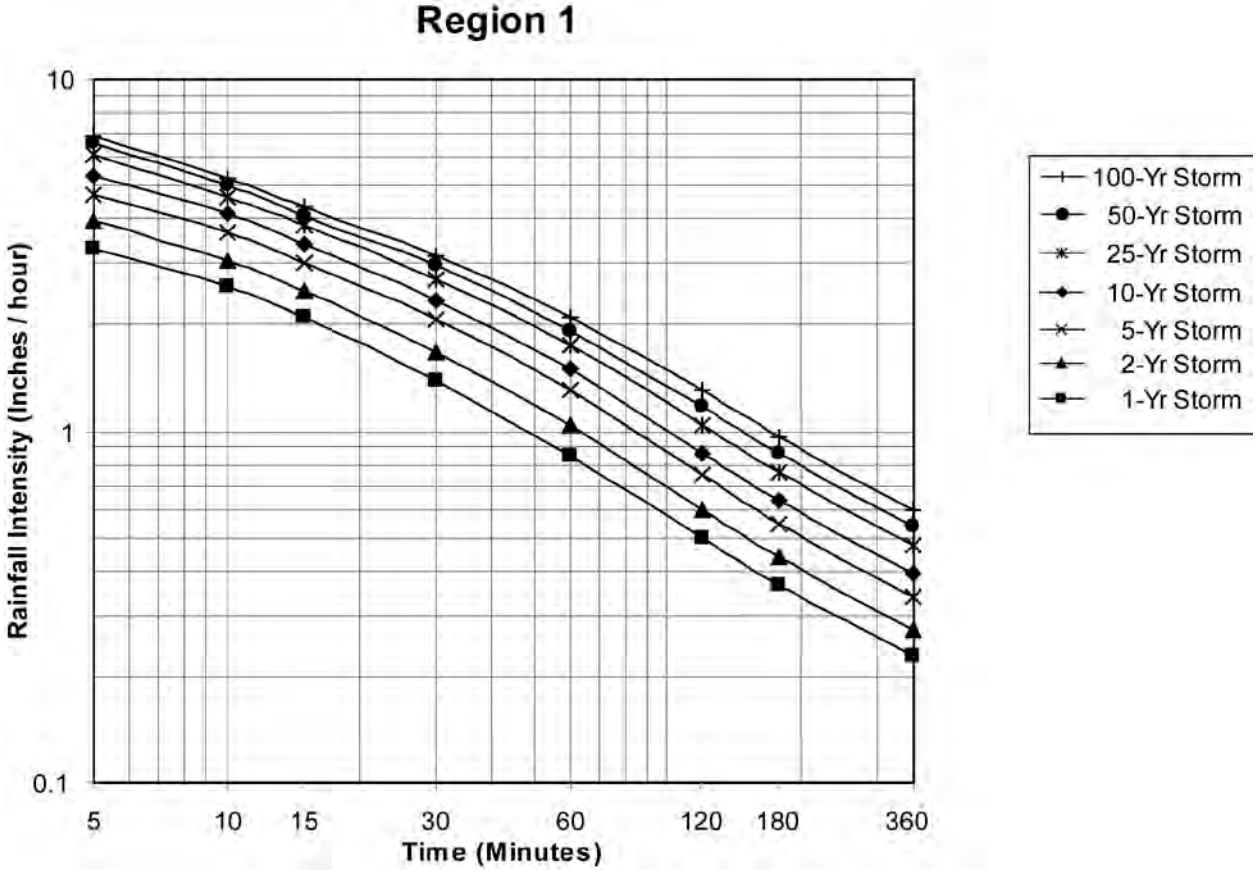


Figure 7A.8(b) Rainfall Amount for 1- through 100-year Storms for Region 1 (U.S. Customary).

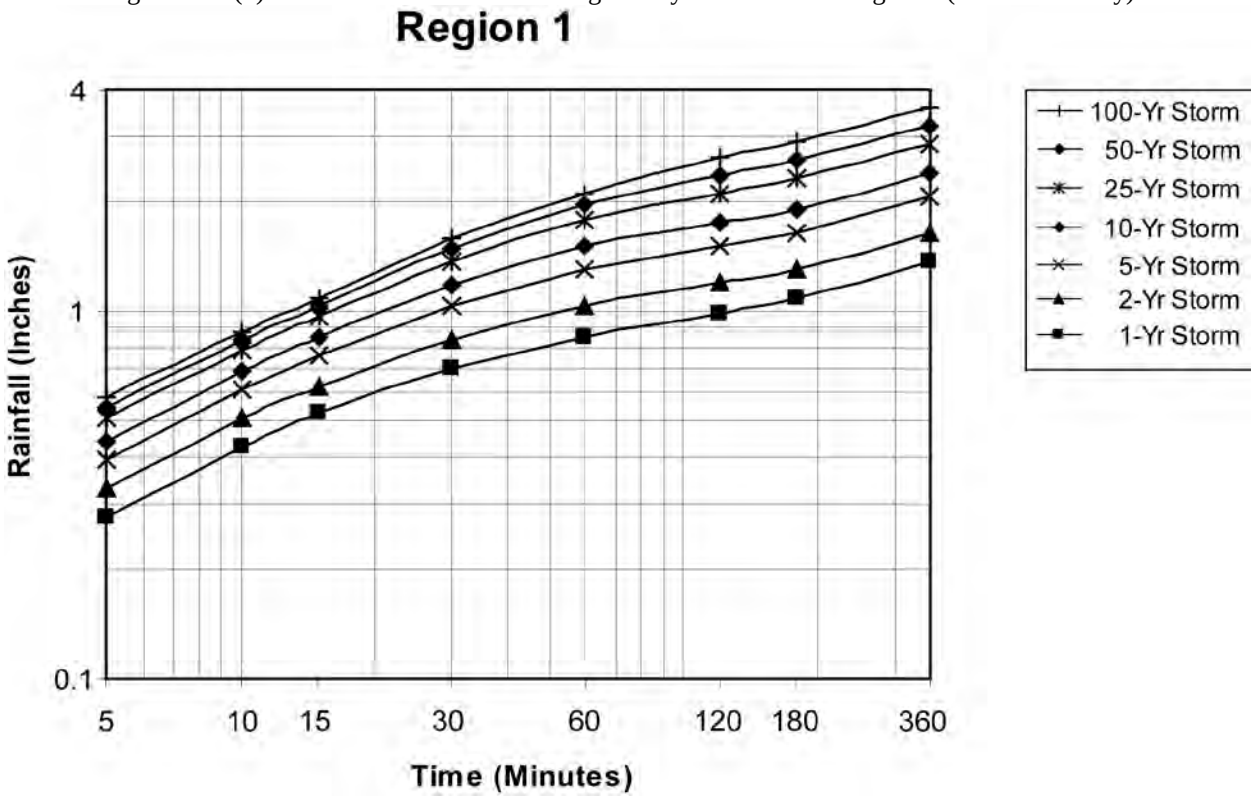


Figure 7A.9(a) Rainfall Intensity for 1- through 100-year Storms for Region 2 (Metric).

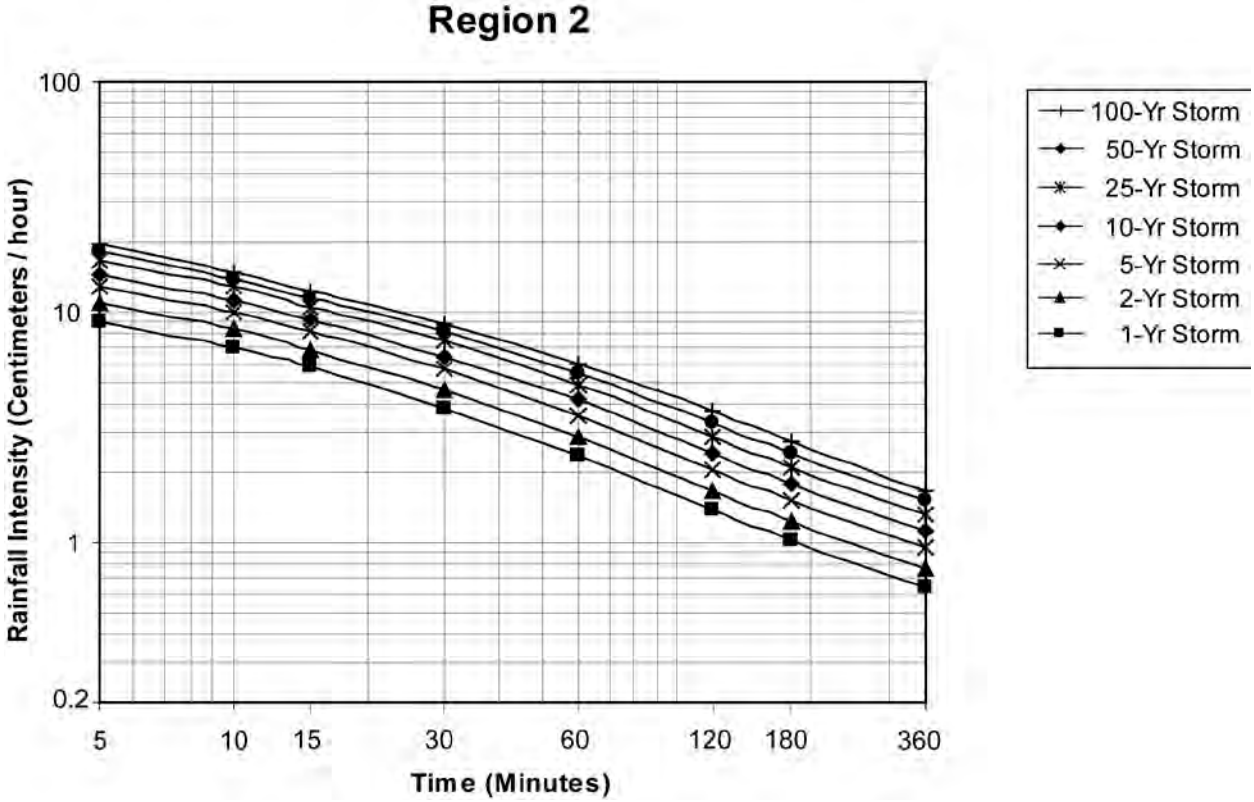


Figure 7A.9(b) Rainfall Amount for 1- through 100-year Storms for Region 2 (Metric).

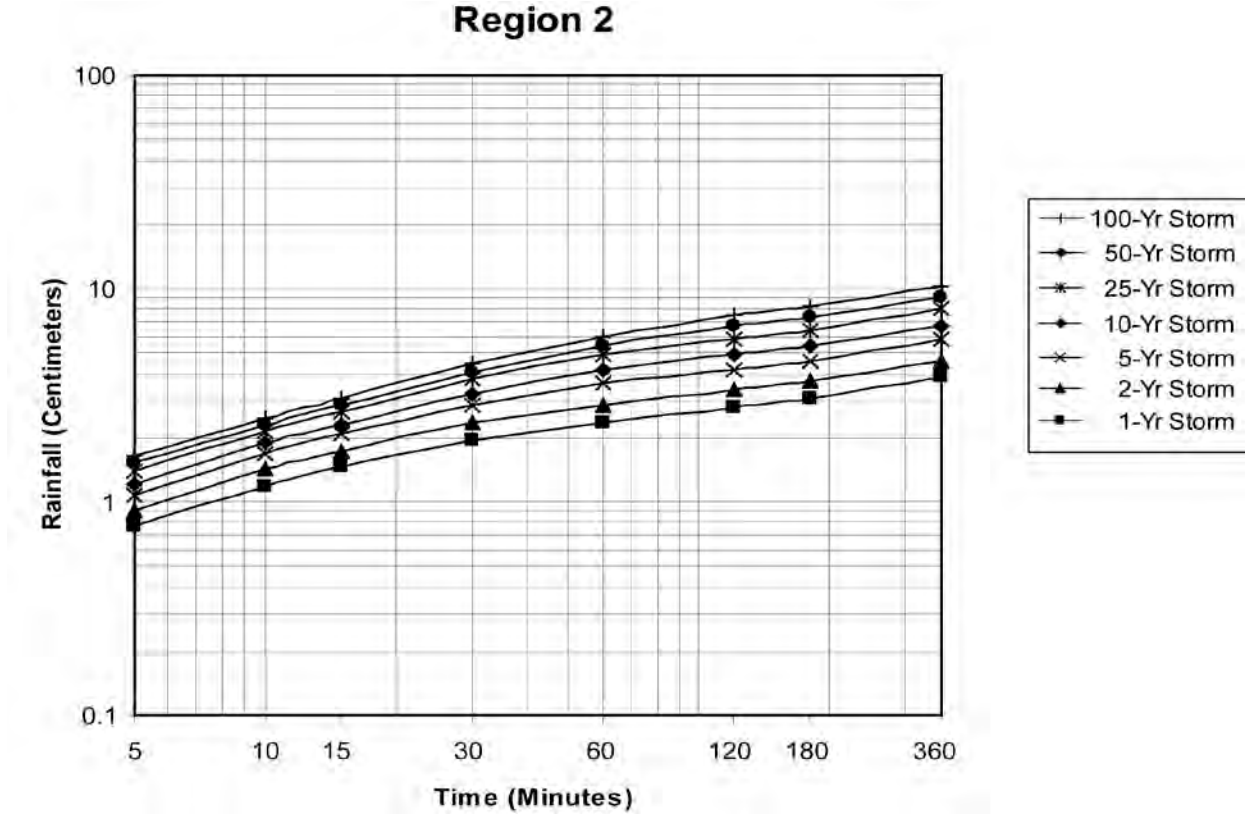


Figure 7A.10(a) Rainfall Intensity for 1- through 100-year Storms for Region 2 (U.S. Customary).

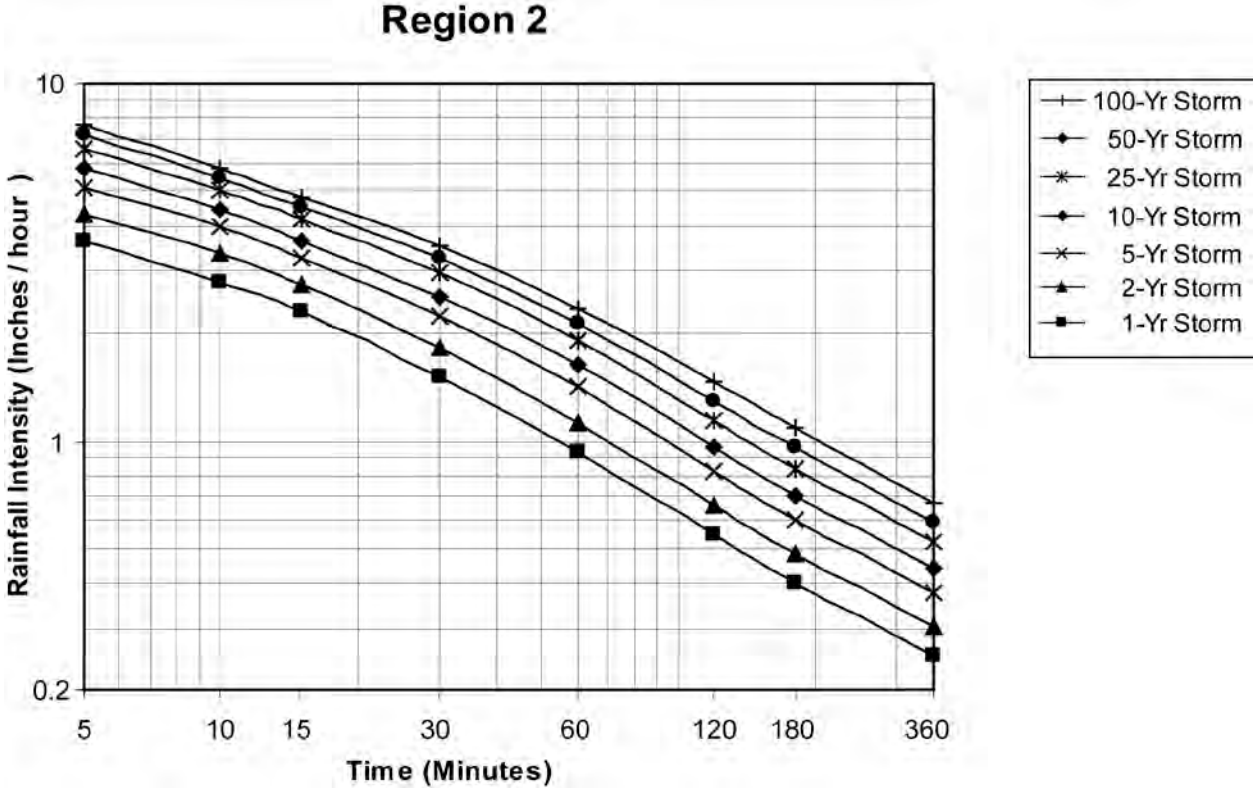


Figure 7A.10(b) Rainfall Amount for 1- through 100-year Storms for Region 2 (U.S. Customary).

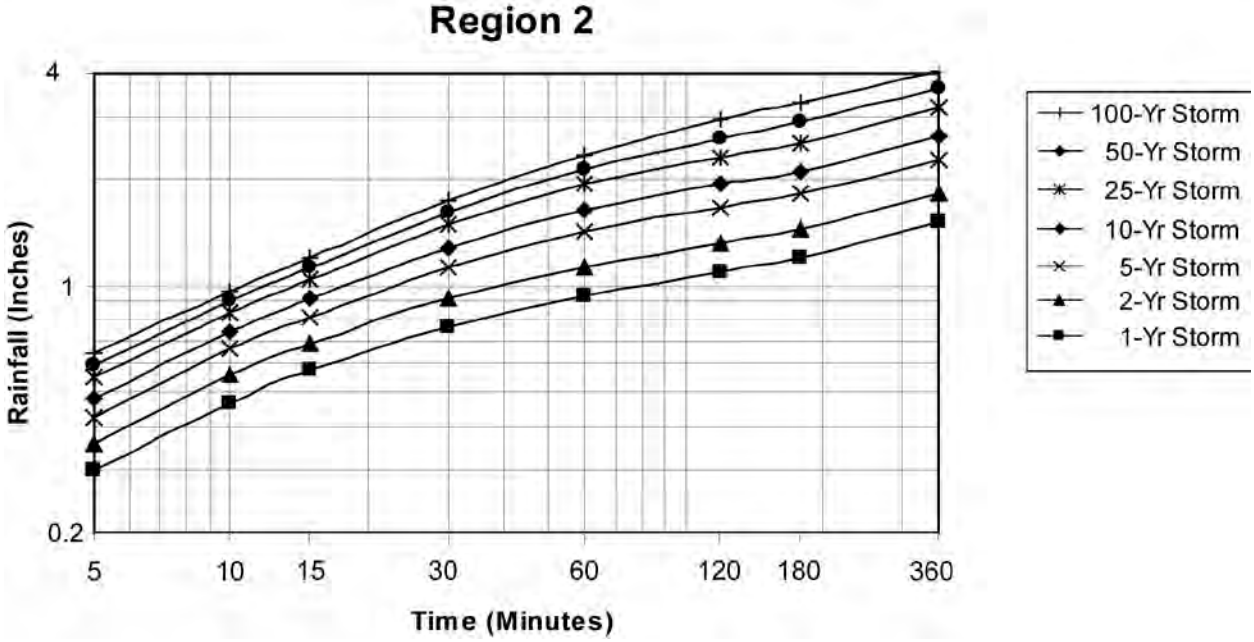


Figure 7A.11(a) Rainfall Intensity for 1- through 100-year Storms for Region 3 (Metric).

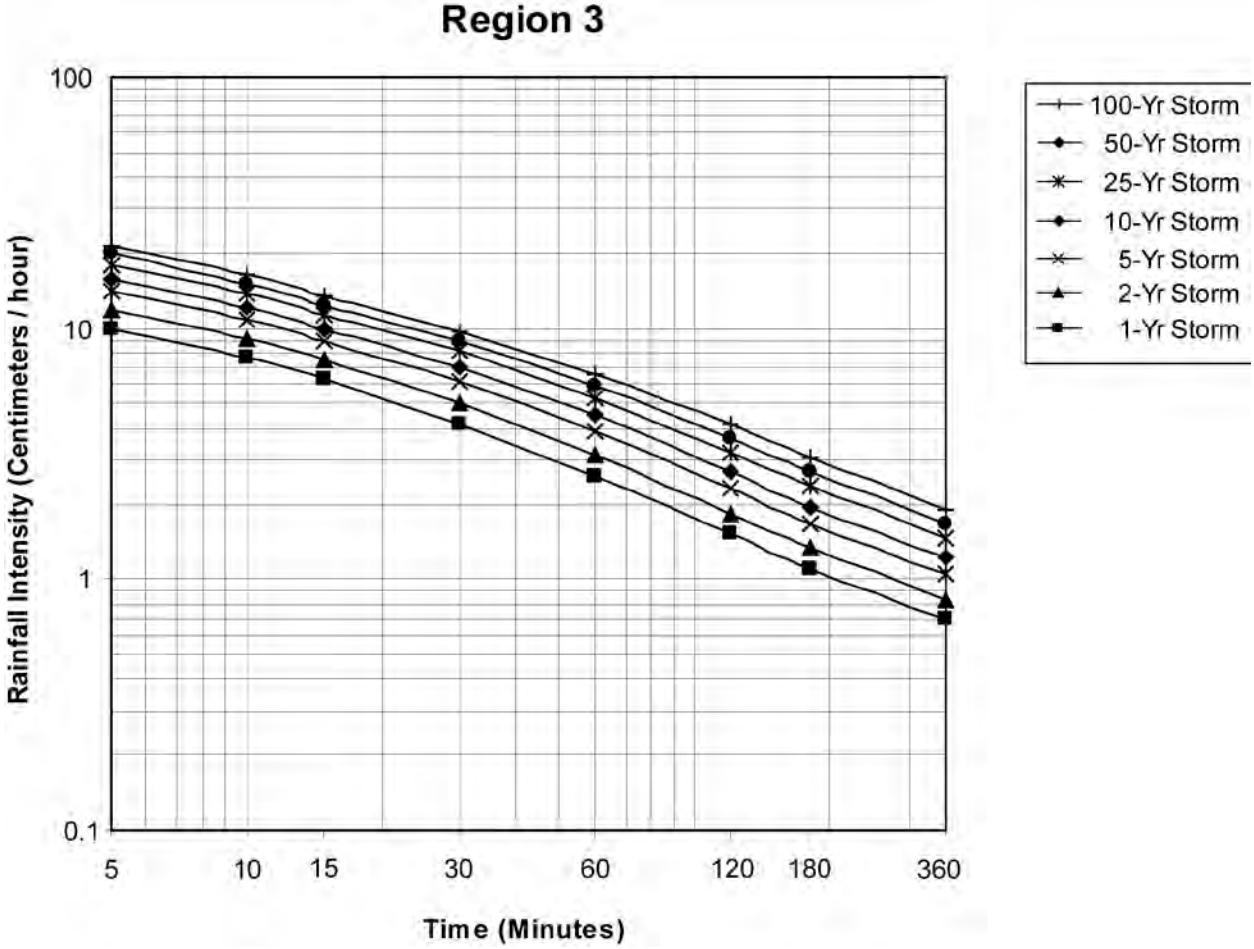


Figure 7A.11(b) Rainfall Amount for 1- through 100-year Storms for Region 3 (Metric).

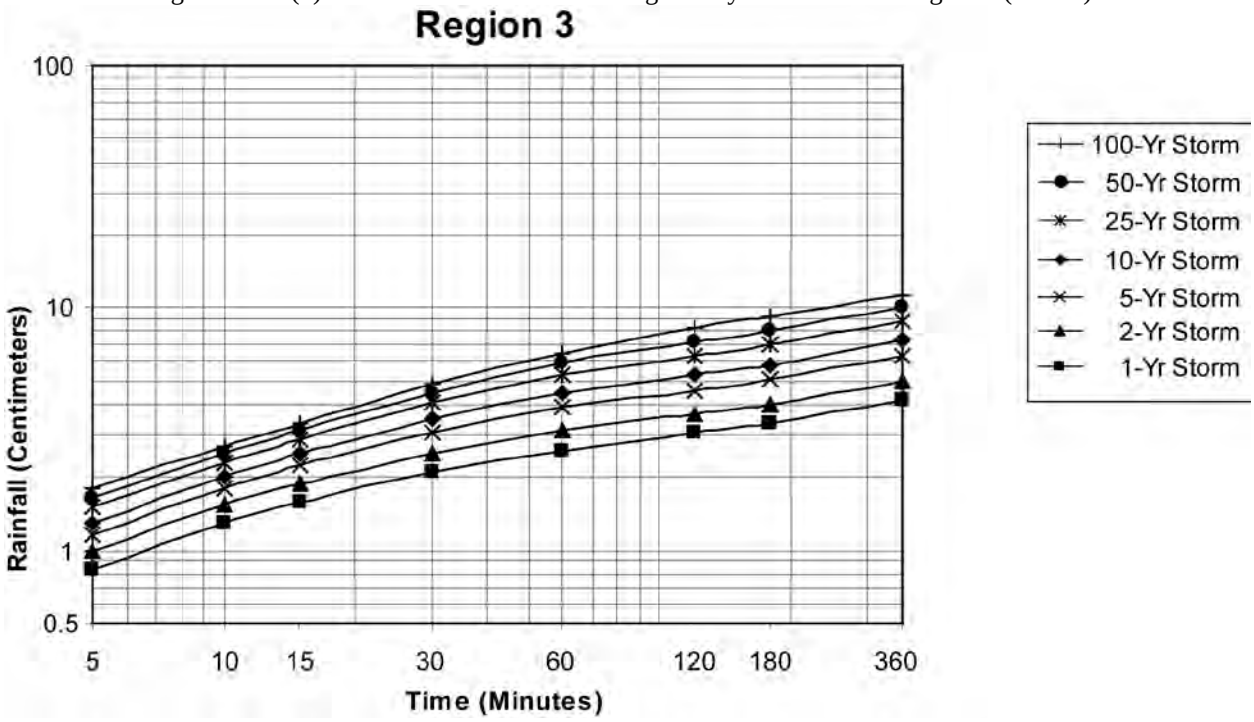


Figure 7A.12(a) Rainfall Intensity for 1- through 100-year Storms for Region 3 (U.S. Customary).

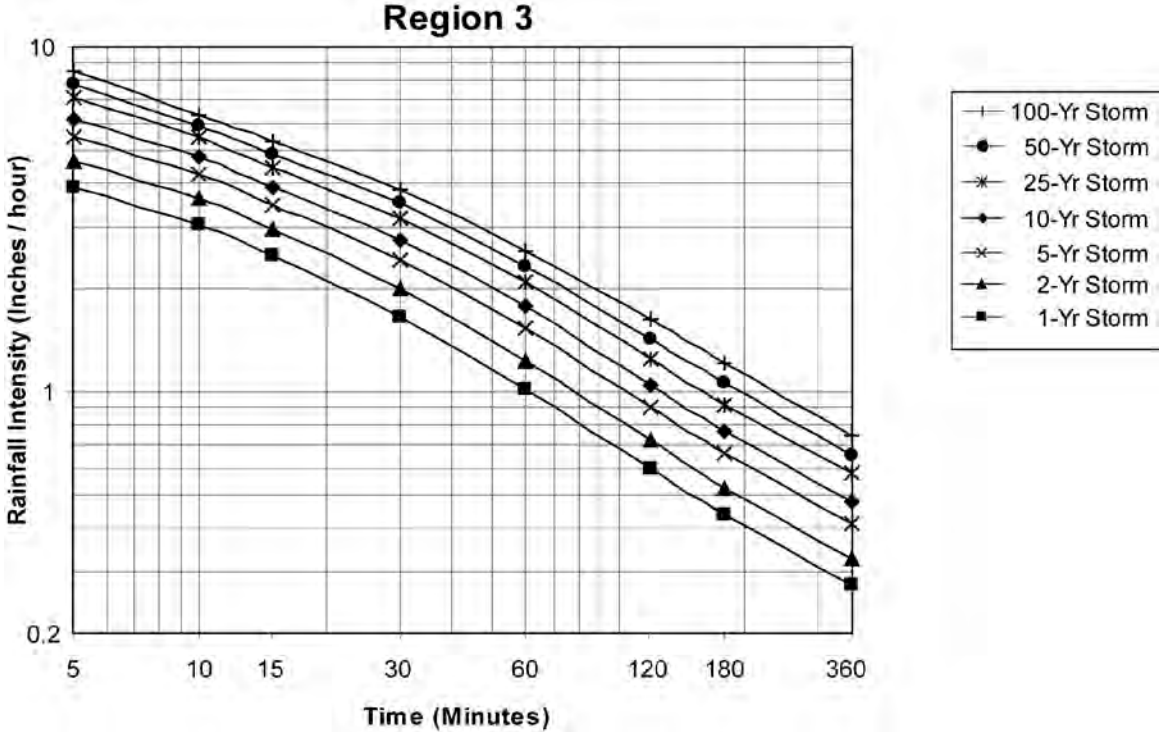


Figure 7A.12(b) Rainfall Amount for 1- through 100-year Storms for Region 3 (U.S. Customary).

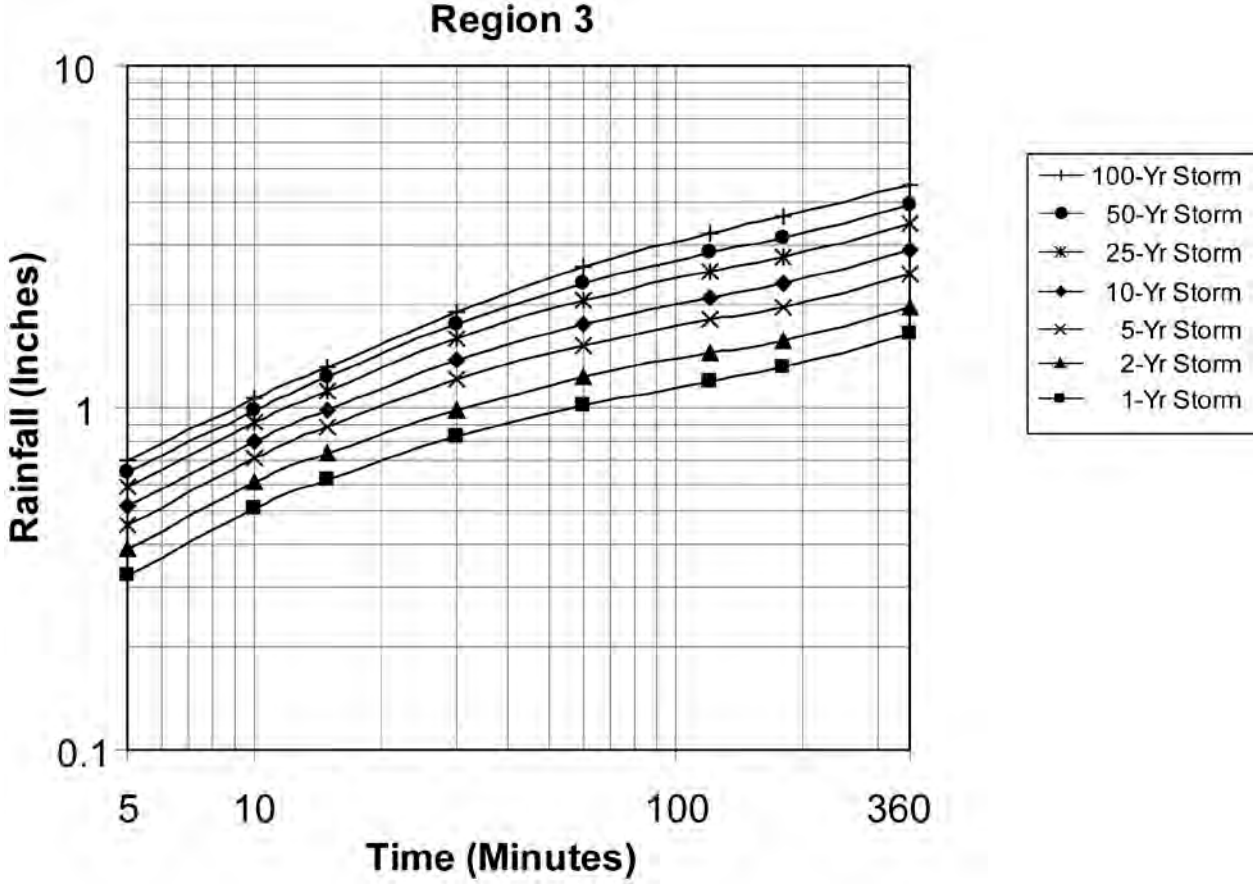


Figure 7A.13(a) Rainfall Intensity for 1- through 100-year Storms for Region 4 (Metric).

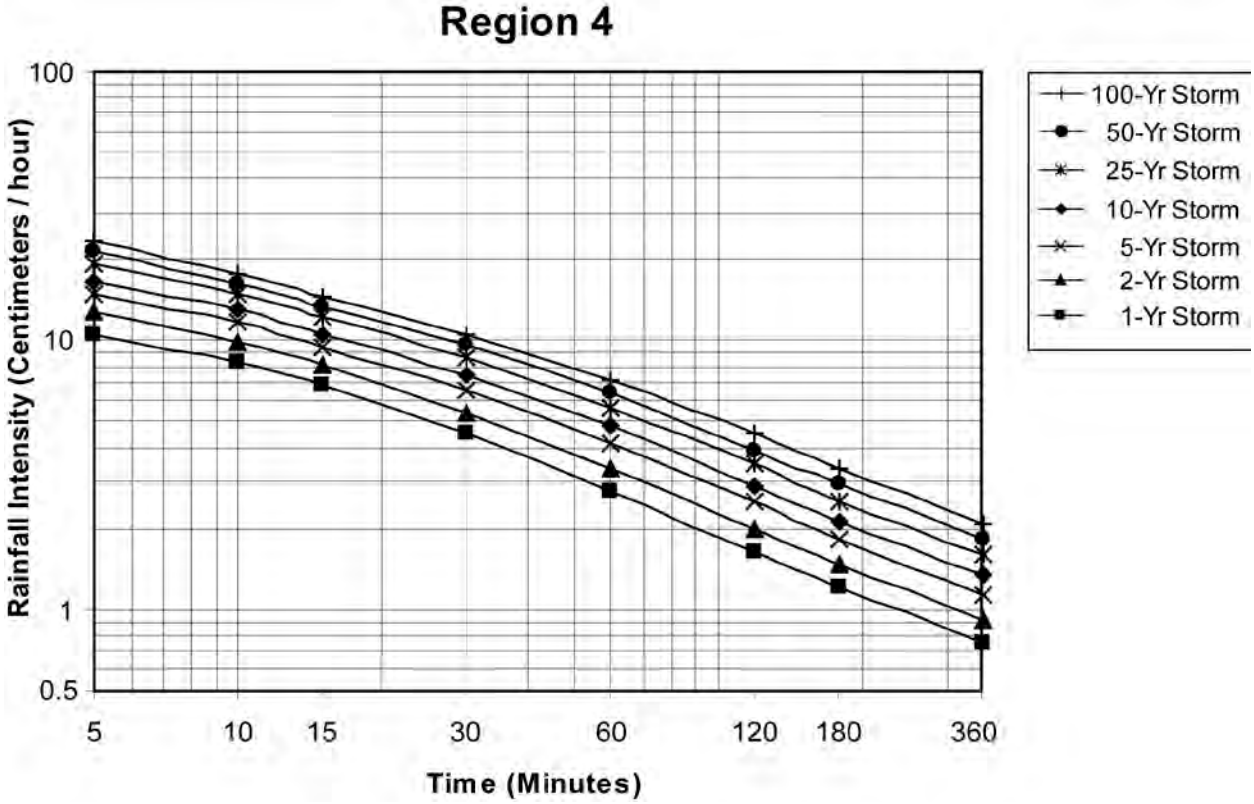


Figure 7A.13(b) Rainfall Amount for 1- through 100-year Storms for Region 4 (Metric).

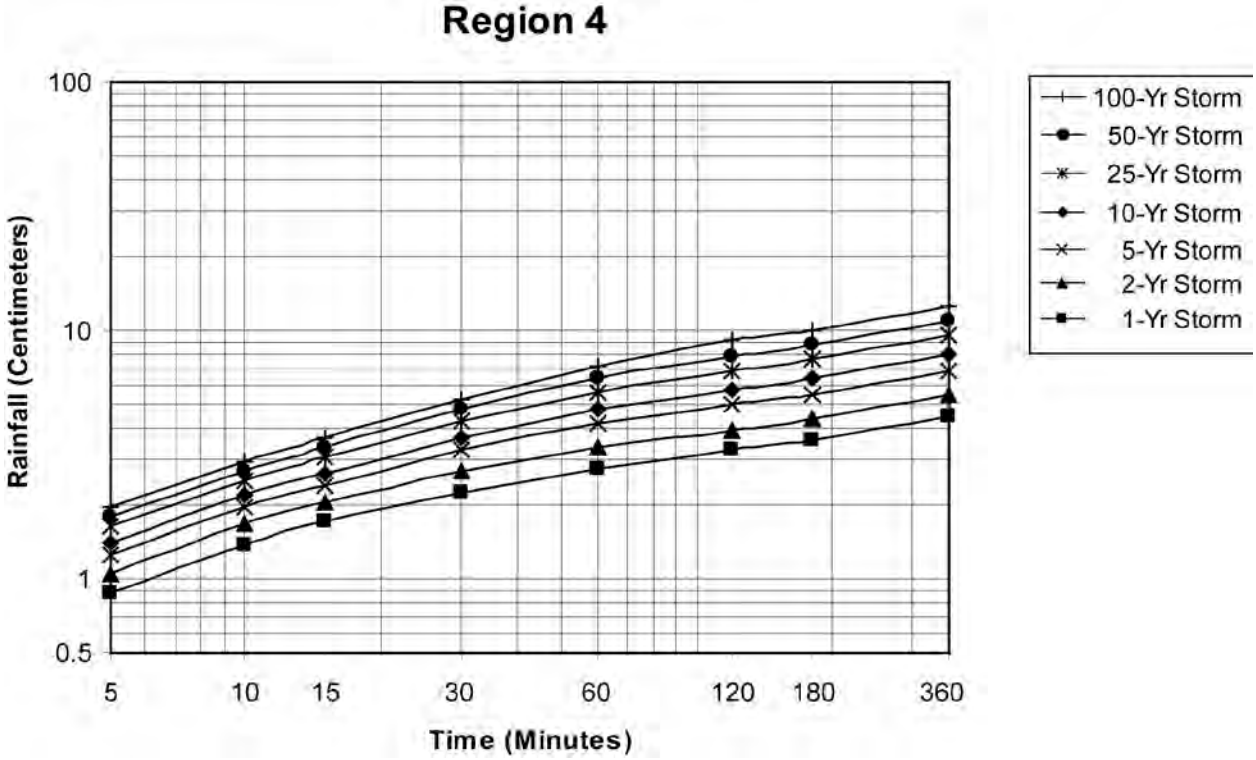


Figure 7A.14(a) Rainfall Intensity for 1- through 100-year Storms for Region 4 (U.S. Customary).

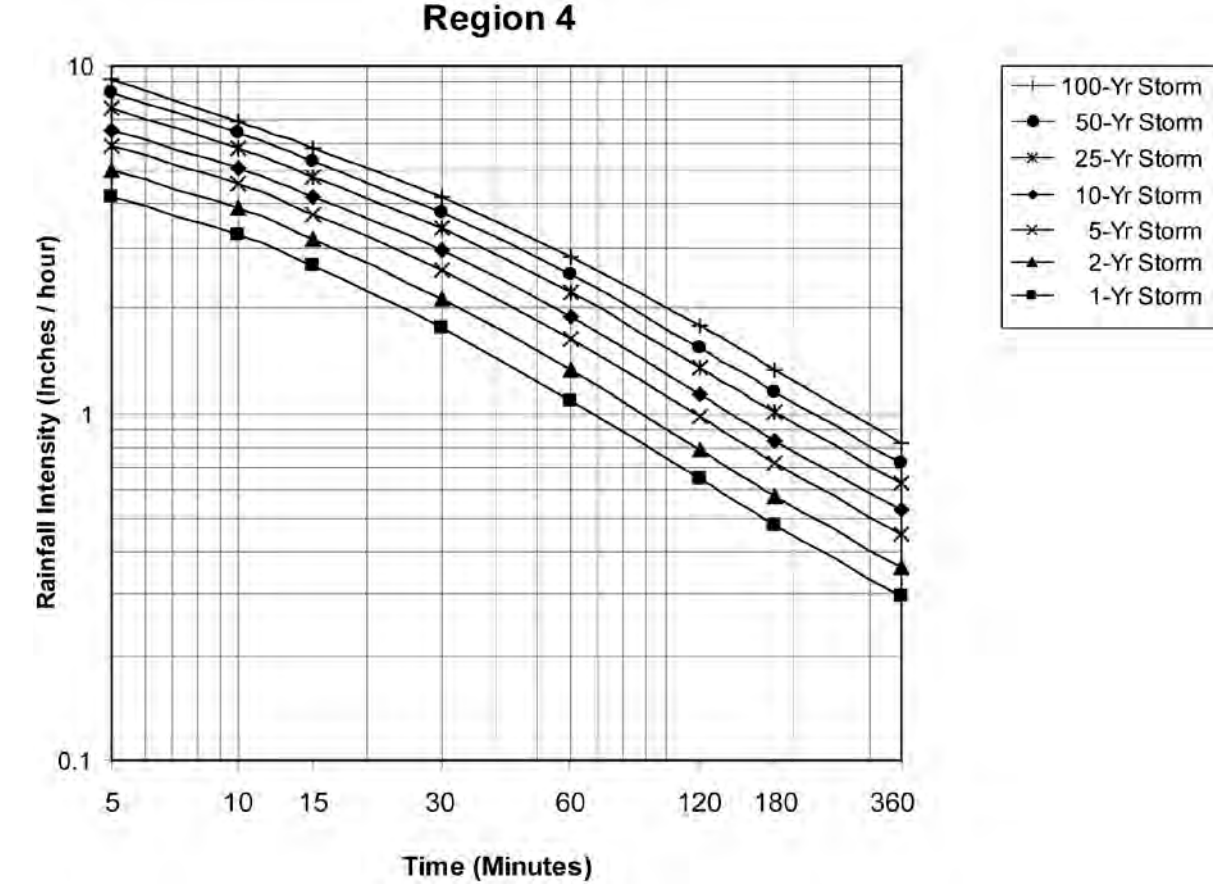


Figure 7A.14(b) Rainfall Amount for 1- through 100-year Storms for Region 4 (U.S. Customary).

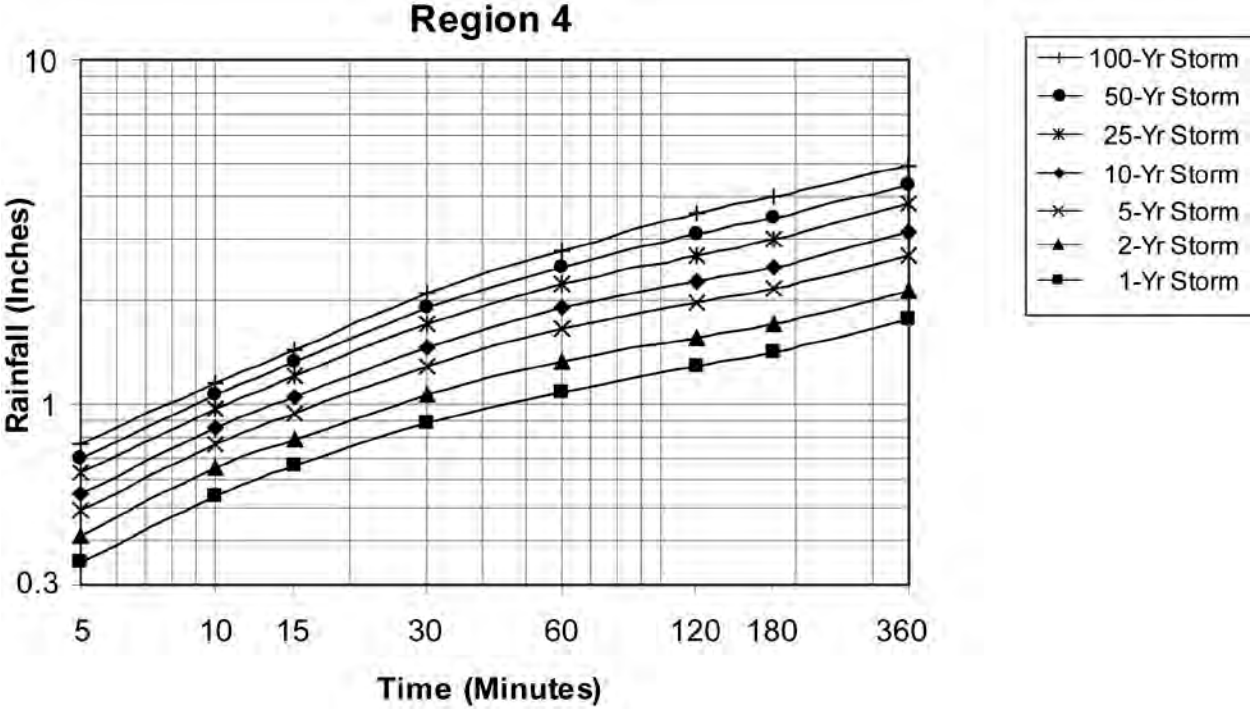


Figure 7A.15(a) Rainfall Intensity for 1- through 100-year Storms for Region 5 (Metric).

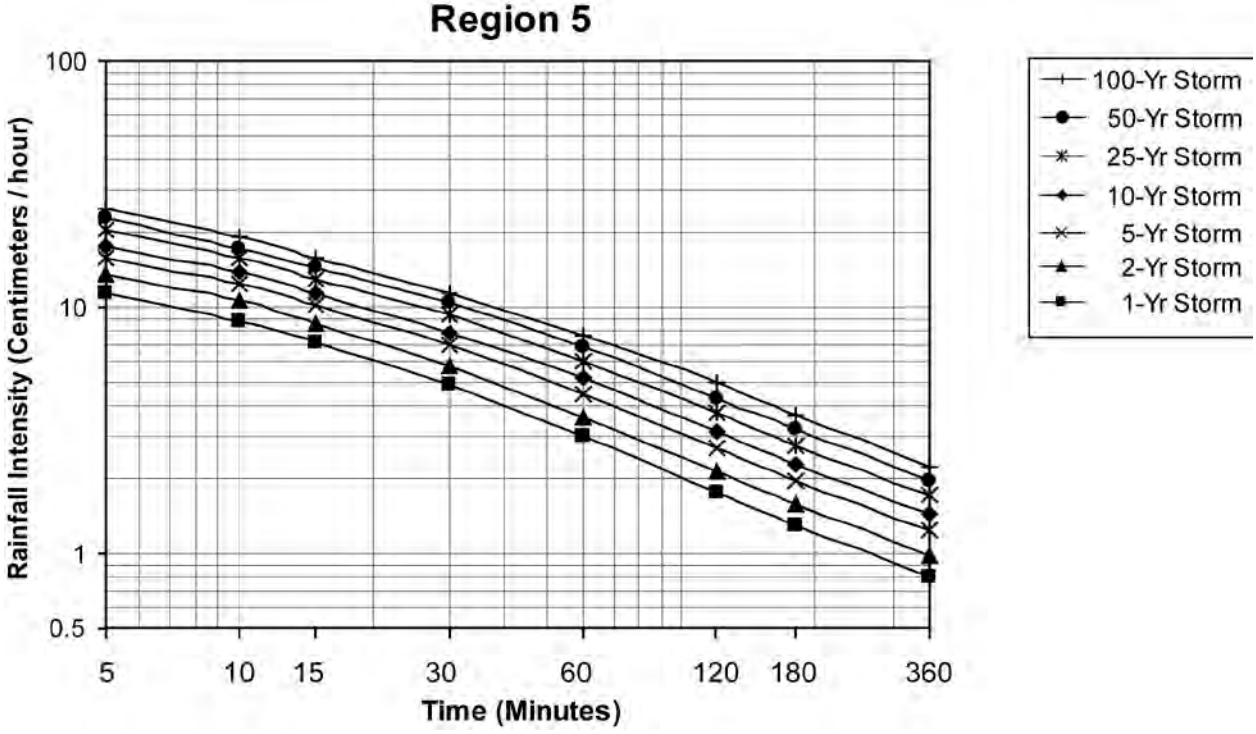


Figure 7A.15(b) Rainfall Amount for 1- through 100-year Storms for Region 5 (Metric).

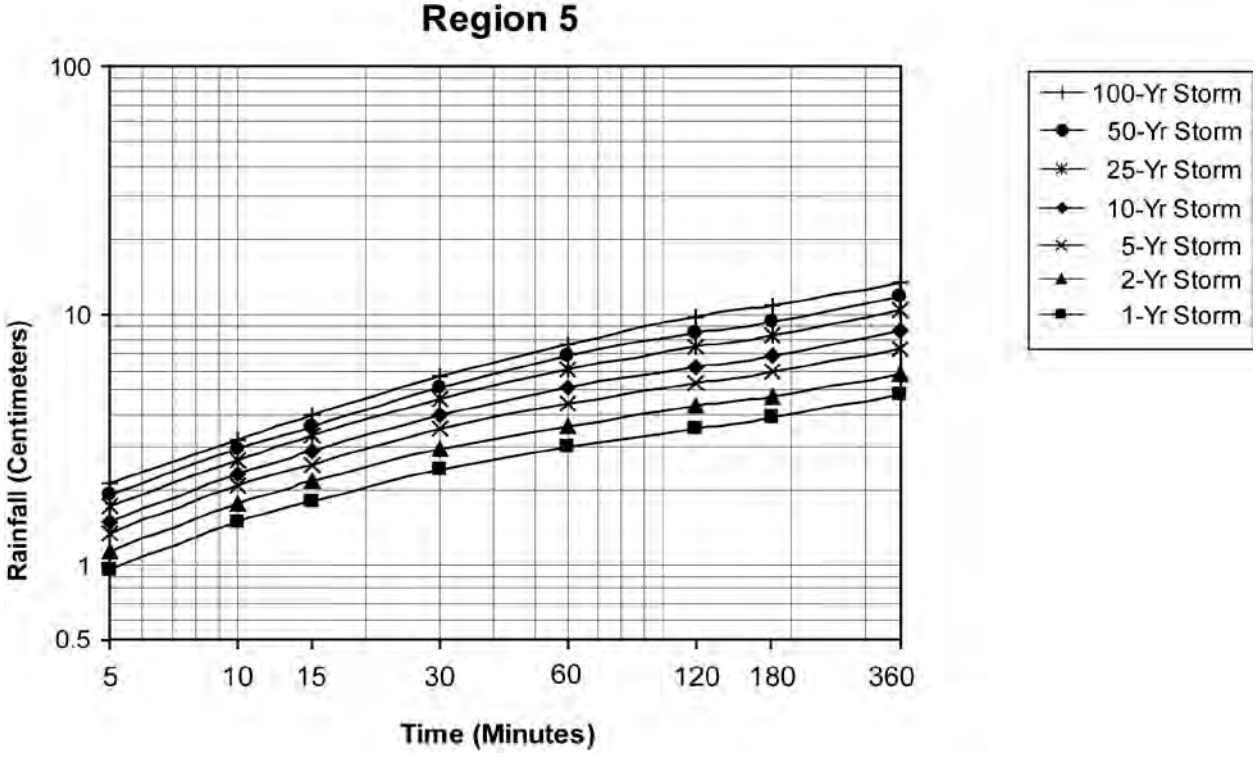


Figure 7A.16(a) Rainfall Intensity for 1- through 100-year Storms for Region 5 (U.S. Customary).

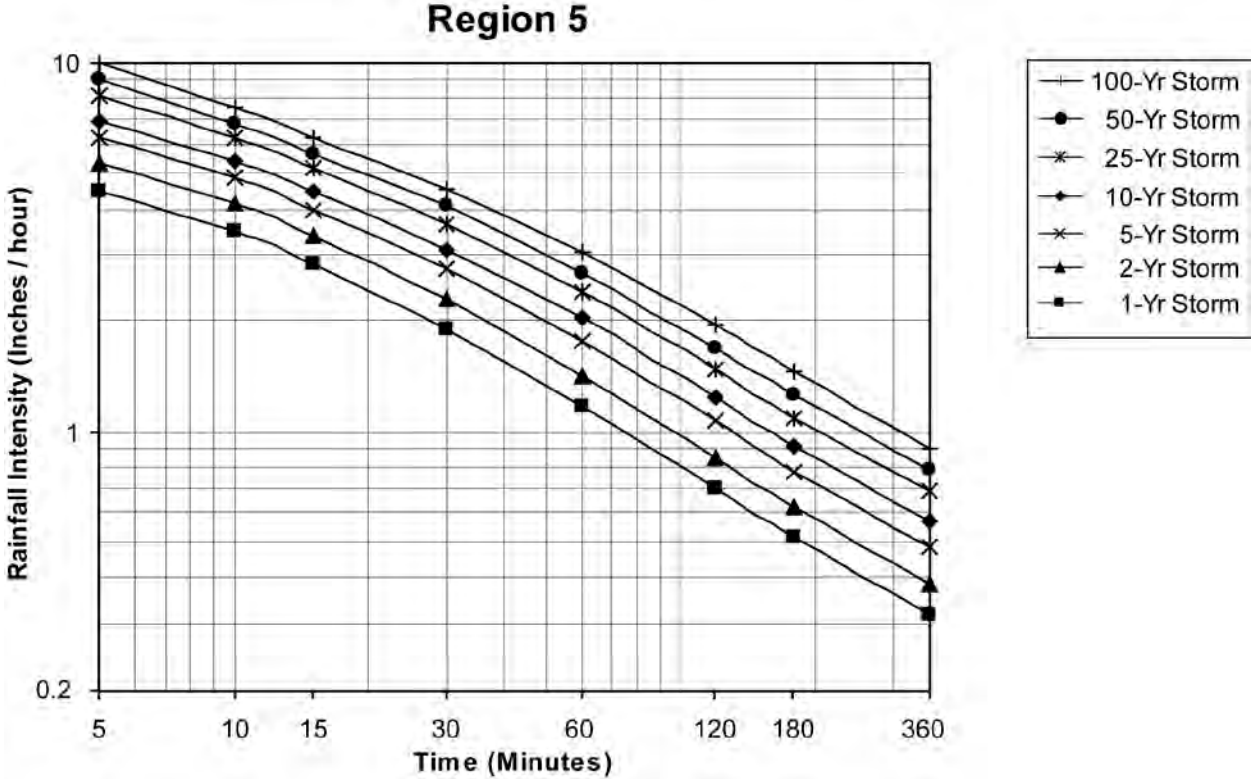
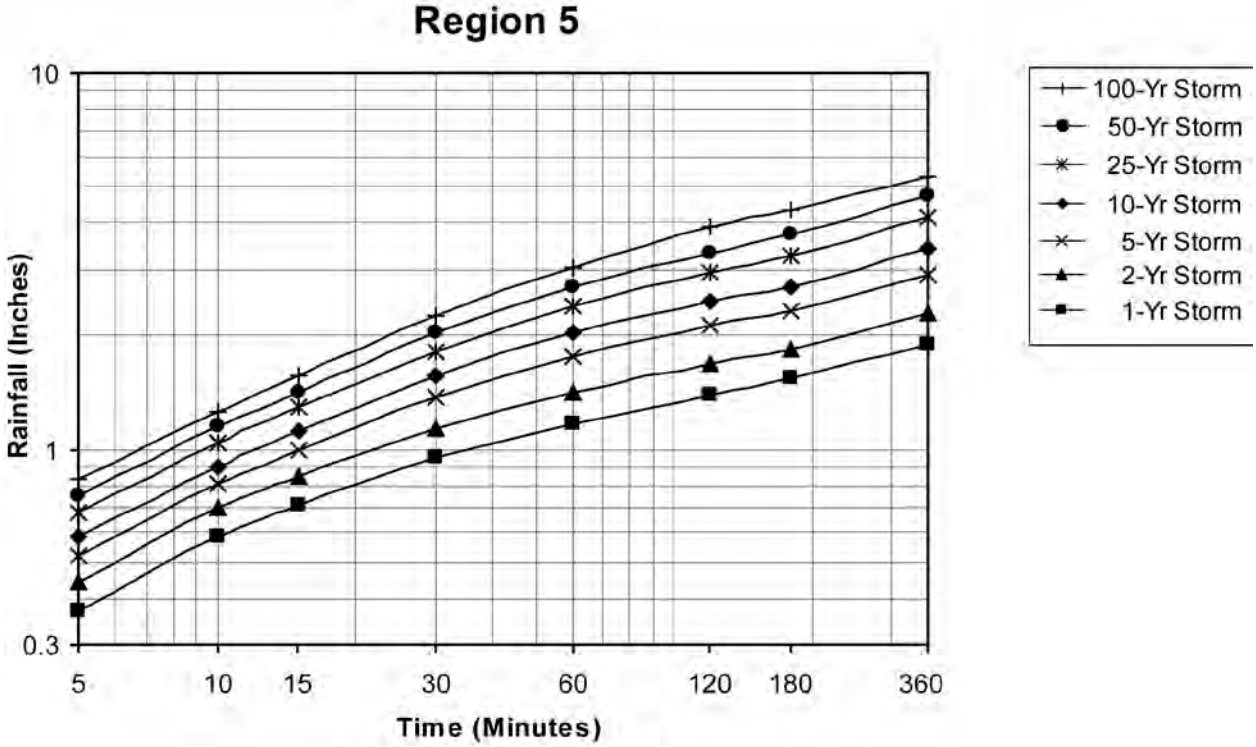


Figure 7A.16(b) Rainfall Amount for 1- through 100-year Storms for Region 5 (U.S. Customary).



APPENDIX F

FAYETTE COUNTY 24-HOUR RAINFALL VALUES

TABLE 1
RAINFALL TECHNICAL RELEASE 55

24 HOUR RAINFALL FOR VARIOUS FREQUENCIES

	1 YEAR	2 YEAR	5 YEAR	10 YEAR	25 YEAR	50 YEAR	100 YEAR
FAYETTE	2.08	2.47	3.02	3.46	4.08	4.60	5.13

STORMWATER MANAGEMENT PERMIT
FEE SCHEDULE
2015

1.	BASE FILING FEE	$850.00
2.	STORMWATER AGREEMENT FEE	$400.00

Checks are made payable to North Union Township.

- The base filing fee is the minimum review fee. The applicant/developer/property owner shall be responsible for all fees incurred for review, including administrative and technical reviews. The fee shall be provided once the plan receives technical approval from North Union Township. The fee must be paid in full before receiving final approval.
    - If the applicant/developer/property owner is provided comments and their response is to provide an entirely revised SWMP, the base filing fee is the minimum review fee. The review process starts as if it were a new application.
- The Stormwater Agreement Fee is to cover the cost of the administrative fee and processing for the agreement as contained within said Ordinance. If the applicant/developer/property owner requests a change of the Agreement, he/she will be responsible for all fees associated for legal review and administrative costs of such.

TO: North Union Township Supervisors
7 South Evans Station Road
Lemont Furnace, PA 15456

RECEIPT

I, Barry R. Blaine, Librarian, Fayette County Law Library, Courthouse, Uniontown, Fayette County, Pennsylvania, hereby acknowledge receipt of an attested copy of the North Union Township Supervisors Ordinance No. 4-2015 (North Union Township Stormwater Management Ordinance), which was enacted by the Board of Supervisors of North Union Township, Fayette County, Pennsylvania, on June 9, 2015.

I further acknowledge that said Ordinance was supplied to the Fayette County Law Library by the Board of Supervisors of North Union Township to be filed in the Fayette County Law Library in accordance with the provisions of the Law of the Commonwealth of Pennsylvania, as set forth at 52 P.S. § 65741, which provides that an attested copy of an Ordinance must be filed in the County Law Library in such cases where the full text of the Ordinance is not included in the Public Notice of the Board of Supervisors' intention to adopt the Ordinance.

I further acknowledge that the above recited Ordinance has been filed in the Fayette County Law Library and is available for review and inspection.

DATED this 8th day of September, 2015.

WITNESS:

Barbara Gasgus

FAYETTE COUNTY LAW LIBRARY

By: Barry R. Blaine
Barry R. Blaine, Librarian