HEIDELBERG TOWNSHIP

STORM WATER MANAGEMENT AND EARTH DISTURBANCE ORDINANCE

MARCH 2006

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TABLE OF CONTENTS

ARTICLE I GENERAL PROVISIONS 1

SECTION 101 SHORT TITLE 1
SECTION 102 STATEMENT OF FINDINGS 1
SECTION 103 PURPOSE 1
SECTION 104 STATUTORY AUTHORITY 2
SECTION 105 APPLICABILITY 2
SECTION 106 RIGHT-OF-ENTRY 2
SECTION 107 GENERAL REQUIREMENTS 2
SECTION 108 REPEALER 3
SECTION 109 SEVERABILITY 3
SECTION 110 COMPATIBILITY WITH OTHER ORDINANCE REQUIREMENTS 3
SECTION 111 MUNICIPAL LIABILITY 3

ARTICLE II DEFINITIONS 4

SECTION 201 DEFINITIONS 4

ARTICLE III DESIGN CRITERIA FOR STORM WATER MANAGEMENT FACILITIES 18

SECTION 301 GENERAL REQUIREMENTS 18
SECTION 302 STORM WATER MANAGEMENT PERFORMANCE STANDARDS 21
SECTION 303 DESIGN CRITERIA FOR STORM WATER MANAGEMENT FACILITIES DETENTION AND RETENTION 27
SECTION 304 DESIGN CRITERIA FOR STORM WATER MANAGEMENT FACILITIES COLLECTION AND CONVEYANCE 32
SECTION 305 DESIGN CRITERIA FOR STORM WATER MANAGEMENT FACILITIES EROSION AND SEDIMENTATION CONTROL 38
SECTION 306 DESIGN STANDARDS - BEST MANAGEMENT PRACTICES (BMP) 40
SECTION 307 CALCULATION METHODOLOGY 49
SECTION 308 USE OF PERFORMANCE STANDARDS AND CRITERIA 56
SECTION 309 FLOODPLAIN 58

TABLE OF CONTENTS (CONTINUED)

ARTICLE IV PLAN REQUIREMENTS 59

SECTION 401 GENERAL REQUIREMENTS 59
SECTION 402 EXEMPTIONS 59
SECTION 403 STORM WATER MANAGEMENT SITE PLAN CONTENTS 60
SECTION 404 PLAN CONTENTS - MAJOR LAND DISTURBANCE 60
SECTION 405 PLAN CONTENTS - MINOR LAND DISTURBANCE 65
SECTION 406 APPLICATION AND PLAN PROCESSING PROCEDURE 66
SECTION 407 APPLICATION REQUIREMENTS 67
SECTION 408 WAIVER PROCEDURE 68
SECTION 409 EXPIRATION OF A STORM WATER MANAGEMENT PERMIT 69
SECTION 410 FINANCIAL SECURITY 69
SECTION 411 RECORD DRAWINGS 70

ARTICLE V MAINTENANCE 71

SECTION 501 MAINTENANCE OF STORM WATER MANAGEMENT FACILITIES AND BMP FACILITIES 71
SECTION 502 PERMANENCE OF STORM WATER MANAGEMENT FACILITIES 74
SECTION 503 PROHIBITED DISCHARGES AND CONNECTIONS 74

ARTICLE VI INSPECTIONS 76

SECTION 601 SCHEDULE OF INSPECTIONS 76

ARTICLE VII ADMINISTRATION 77

SECTION 701 REMEDIES 77
SECTION 702 VIOLATIONS AND PENALTIES 79
SECTION 703 APPEALS 80
SECTION 704 FEES 80
SECTION 705 REPEALER 81
SECTION 706 ADOPTION AND EFFECTIVE DATE 82

TABLE OF CONTENTS (CONTINUED)

APPENDICES

APPENDIX 1	APPLICATION FOR A STORM WATER MANAGEMENT PERMIT - MINOR LAND DISTURBANCE ACTIVITY	A-1
APPENDIX 2	APPLICATION FOR A STORM WATER MANAGEMENT PERMIT - MAJOR LAND DISTURBANCE ACTIVITY	A-2
APPENDIX 3	STORM WATER MANAGEMENT PERMIT	A-3
APPENDIX 4	STORM WATER MANAGEMENT PERMIT INSPECTION SCHEDULE	A-4
APPENDIX 5	INTENSITY-DURATION-FREQUENCY CHART	A-5
APPENDIX 6	RUNOFF COEFFICIENTS - RATIONAL METHOD	A-6
APPENDIX 7	RUNOFF CURVE NUMBERS - SCS METHOD	A-7
APPENDIX 8	TIME OF CONCENTRATION NOMOGRAPH - RATIONAL METHOD	A-8
APPENDIX 9	WORKSHEET #1 - TIME OF CONCENTRATION OR TRAVEL TIME	A-9
APPENDIX 10	AVERAGE VELOCITIES FOR ESTIMATING TRAVEL TIME FOR SHALLOW CONCENTRATED FLOW	A-10
APPENDIX 11	TYPE DW HEADWALL TRASH RACK EXAMPLE	A-11
APPENDIX 12	GRASS SWALE W/CHECK DAM (DIKE) EXAMPLE	A-12
APPENDIX 13	ROOF DRAIN LATERAL AND IN-LINE CLEAN-OUT DETAILS	A-13
APPENDIX 14	INFILTRATION TRENCH EXAMPLE	A-14
APPENDIX 15	DRY WELL EXAMPLE	A-15
APPENDIX 16	INFILTRATION BASIN EXAMPLE	A-16
APPENDIX 17	EXTENDED DRY DETENTION POND EXAMPLE	A-17
APPENDIX 18	WET POND EXAMPLE	A-18
APPENDIX 19	WATER QUALITY INLET EXAMPLE	A-19
APPENDIX 20	CISTERN	A-20
APPENDIX 21	MINOR LAND DISTURBANCE PLAN (BLANK)	A-21
APPENDIX 21a	MINOR LAND DISTURBANCE PLAN (EXAMPLE)	A-22
APPENDIX 22	BOARD OF SUPERVISORS APPROVAL CERTIFICATE	A-23
APPENDIX 23	PLANNING COMMISSION APPROVAL CERTIFICATE	A-23
APPENDIX 24	TOWNSHIP ENGINEER APPROVAL CERTIFICATE	A-23
APPENDIX 25	STORM WATER MANAGEMENT CERTIFICATION	A-24
APPENDIX 26	STORM WATER MANAGEMENT EXEMPTION CRITERIA	A-25
APPENDIX 27	STORM WATER MANAGEMENT DRAINAGE DISTRICT MAP	MAP POCKET

HEIDELBERG TOWNSHIP

Lebanon County, Pennsylvania

ORDINANCE NO. _____

AN ORDINANCE FOR THE MANAGEMENT OF STORM WATER RUNOFF AND EARTH DISTURBANCE ACTIVITIES IN HEIDELBERG TOWNSHIP, LEBANON COUNTY, PENNSYLVANIA; CONTAINING GENERAL PROVISIONS, DEFINING CERTAIN TERMS; ESTABLISHING PERMIT PROCEDURES AND REQUIREMENTS; ESTABLISHING DESIGN STANDARDS AND PLAN REQUIREMENTS; AND PROVIDING FOR THE ADMINISTRATION OF THE ORDINANCE INCLUDING THE IMPOSITION OF FINES AND PENALTIES.

BE AND IT IS HEREBY ORDAINED AND ENACTED by the Township Supervisors of Heidelberg Township, Lebanon County, Pennsylvania, as follows:

COCALICO CREEK & TULPEHOCKEN CREEK WATERSHEDS
ACT 167 STORM WATER MANAGEMENT ORDINANCE
HEIDELBERG TOWNSHIP

AN ORDINANCE TO IMPLEMENT THE REQUIREMENTS OF THE COCALICO CREEK WATERSHED AND TULPEHOCKEN CREEK WATERSHED STORM WATER MANAGEMENT PLANS.

ARTICLE I
GENERAL PROVISIONS

SECTION 101 SHORT TITLE

This Ordinance shall be known as the Heidelberg Township Storm Water Management and Earth Disturbance Ordinance of 2006.

SECTION 102 STATEMENT OF FINDINGS

The Board of Supervisors of Heidelberg Township finds that:

A. Inadequate management of accelerated storm water runoff resulting from development throughout a watershed increases flood flows and velocities, contributes to erosion and sedimentation, overtaxes the carrying capacity of existing streams and storm sewers, greatly increases the cost of public facilities to convey and manage storm water, undermines floodplain management and flood reduction efforts in upstream and downstream communities, reduces groundwater recharge, and threatens public health and safety.

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

SECTION 103 PURPOSE

The purpose of this Ordinance is to promote health, safety, and welfare within the Cocalico Creek Watershed and the Tulpehocken Creek Watershed by minimizing the damages described in Section 102 A. of this Ordinance through provisions designed to:

A. Manage accelerated runoff and erosion and sedimentation problems at their source by regulating activities that cause these problems.

B. Utilize and preserve the existing natural drainage systems.

C. Encourage recharge of groundwater where appropriate and prevent degradation of groundwater quality.

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

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

F. Provide proper maintenance of all permanent storm water management facilities that are constructed in the Township.

G. Provide performance standards and design criteria for watershed-wide storm water management and planning.

SECTION 104 STATUTORY AUTHORITY

The Board of Supervisors of Heidelberg Township is empowered to regulate land use activities that affect runoff by the authority of the Storm Water Management Act, the Second Class Township Code and the Floodplain Management Act.

SECTION 105 APPLICABILITY

Any landowner or any person engaged in the alteration or development of land which may affect storm water runoff characteristics shall implement such measures consistent with the provisions of the Cocalico Creek Watershed Act 167 Storm Water Management Plan and the Tulpehocken Creek Watershed Act 167 Storm Water Management Plan. This Ordinance shall apply to all areas of Heidelberg Township as delineated in the Watershed Boundary Map of this Ordinance located in Appendix 27, which is hereby adopted as part of this Ordinance.

SECTION 106 RIGHT-OF-ENTRY

Upon presentation of proper credentials, duly-authorized representatives of Heidelberg Township may enter at reasonable times upon any property within the Township to investigate or ascertain the condition of the subject property in regard to any aspect regulated by this Ordinance. The landowner shall grant to the Township, or its agents, access to the site of the work at all times, while under construction, for the purpose of inspecting the work.

SECTION 107 GENERAL REQUIREMENTS

For any of the activities regulated by this Ordinance, the final approval of subdivision and/or land development plans, the issuance of any zoning, building or occupancy permit, or the commencement of any land disturbance activity may not proceed, except in cases where

Appendix 26 exemption criteria applies, until the Property Owner or Developer or his/her agent has received written approval of a Storm Water Management Site Plan from the Township and an NPDES permit has been issued by the Lebanon County Conservation District when required.

SECTION 108 REPEALER

All ordinances or parts of ordinances inconsistent with the provisions of this Ordinance are hereby repealed. It is expressly provided that the provisions of this Ordinance shall not affect any act done, contract executed or liability incurred prior to its effective date, or affect any suit or prosecution pending or to be instituted to enforce any rights, rule, regulation or ordinance, or part thereof, or to punish any violation which occurred under any prior regulation or ordinance of Heidelberg Township. In the event any violation has occurred under any prior regulation or ordinance of Heidelberg Township or Lebanon County, prosecution may be initiated against the alleged offender pursuant to the provisions of said prior regulation or ordinance, and the provisions and penalties provided in said prior regulation or ordinance shall remain effective as to said violation.

SECTION 109 SEVERABILITY

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

SECTION 110 COMPATIBILITY WITH OTHER ORDINANCE REQUIREMENTS

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

SECTION 111 MUNICIPAL LIABILITY

Except as specifically provided by the Pennsylvania Storm Water Management Act, Act of October 4, 1978, P.L. 864, No. 167, as amended, 32 P.S. §680.1 et seq., the making of any administrative decision by the Township or any of its officials or employees shall not constitute a representation, guarantee or warranty of any kind by the Township of the practicability or safety of any proposed structure or use with respect to damage from erosion, sedimentation, storm water runoff, flood, or any other matter, and shall create no liability upon or give rise to any cause of action against the Township and its officials and employees. The Board of Supervisors, by enacting this Ordinance, does not waive or limit any immunity granted to the Township and its officials and employees by the Governmental Immunity Act, 42 PA. C.S. §8541 et seq., and does not assume any liabilities or obligations.

ARTICLE II
DEFINITIONS

SECTION 201 DEFINITIONS

Unless otherwise stated, the following words shall for the purpose of this Ordinance have the meaning herein indicated. Words in the present tense include the future tense. Words in singular include the plural and words in the plural include the singular.

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 and character.

The words “shall” and “must” are mandatory; the words “may” and “should” are permissive.

The words “used or occupied” include the words “intended, designed, maintained, or arranged to be used or occupied”.

The masculine gender includes the feminine gender and the neuter. The word "person" includes a partnership, corporation, association, trust, estate, or any other legally recognized entity as well as an individual and the officers of any corporation and the members of any partnership. References to "codes, ordinances, resolutions, plans, maps, governmental bodies, commissions or agencies, or officials" are references to codes, ordinances, resolutions, plans, maps, governmental bodies, commissions or agencies, or officials of Heidelberg Township or the Commonwealth of Pennsylvania as in effect or office from time to time including amendments thereto or revisions or successors thereof, unless the text indicates another reference is intended.

Words not herein defined shall have the meanings given in Webster's Unabridged Dictionary and shall be interpreted so as to give this Ordinance its most reasonable application.

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

Act 167 Plan: he Plan for managing storm water runoff in the Cocalico Creek Watershed and Tulpehocken Creek Watershed adopted by Lebanon County as required by the Storm Water Management Act, and known as the Cocalico Creek Watershed Act 167 Storm Water Management Plan and as the Tulpehocken Creek Watershed Act 167 Storm Water Management Plan.

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

Agricultural Use of Land: The use of land exclusively for the cultivation of soil, the production of crops or livestock, or the science of forestry in accordance with recognized soil management

practices; also land which has been diverted from agricultural use by an active federal farm program, provided the land has a conservation cover of grass, legume, trees, or wildlife shrubs.

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

Applicant: A landowner or developer, as hereinafter defined who has filed an application for a storm water management or earth disturbance permit, including his heirs, successors and assigns.

Best Management Practice (BMP): Structural devices or non-structural methods that temporarily store or treat storm water runoff to reduce flooding, remove pollutants, and provide other environmental amenities.

Bio-retention: A form of BMP designed as either on-line or off-line which are areas constructed with sand and soil mixtures planted with native plants. Bio-retention is an efficient method for removing a wide variety of pollutants from storm water runoff, such as suspended solids and nutrients.

A. Off-line bio-retention areas receive runoff from overland flow or from a diversion structure in a traditional drainage system.

B. On-line bio-retention areas have the same composition as off-line areas, however they are located in grass swales or other conveyance systems that have been modified to enhance pollutant removal by quiescent settling and biofiltration.

Board of Supervisors: The Board of Supervisors of the Township of Heidelberg, Lebanon County, Pennsylvania.

Building: Any structure, either temporary or permanent, having walls and a roof, designed or used for the shelter of any person, animal or property and occupying more than one hundred (100) square feet of area.

Carbonate Geology: Limestone or dolomite bedrock.

Channel: A natural or artificial watercourse with a definite bed and banks that confine and conduct continuously or periodically flowing water.

Channel Erosion: The widening, deepening, and headward cutting of small channels and waterways, due to erosion caused by moderate to large floods.

Chapter 102: Chapter 102 of the Regulations of PADEP, 25 Pa. Code Sect. 102.1 et seq.

Chapter 105: Chapter 105 of the Regulations of PADEP, 25 Pa. Code Sect. 105.1 et seq.

Chapter 106: Chapter 106 of the Regulations of PADEP, 25 Pa. Code Sect. 106.1 et seq.
Cistern: An underground reservoir for storing storm water runoff from rooftops.

Conservation District: The Lebanon County Conservation District.

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

Culvert: A structure with appurtenant works that carries a watercourse under or through an embankment or fill.

Dam: An artificial barrier, together with its appurtenant works, constructed for the purpose of impounding or storing water or another fluid or semifluid, or a refuse bank, fill or structure for highway, railroad or other purposes which does or may impound water or another fluid or semifluid. The dam falls under the requirements of Chapter 105, Dam Safety and Waterway management, if the following is true:

A. The contributory drainage area exceeds one hundred (100) acres.

B. The greatest depth of water measured by upstream toe of the dam at maximum storage elevation exceeds fifteen (15) feet.

C. The impounding capacity at maximum storage elevation exceeds fifty (50) acre-feet.

Dedication: The deliberate appropriation of land by its owner for any general and public use.

Design Storm: The magnitude of precipitation from a storm event measured in probability of occurrence (e.g., 10-year storm) and duration (e.g., 24-hour), and used in computing storm water runoff for the design of storm water management facilities.

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

Detention Basin: A vegetated basin designed to drain completely after storing runoff only for a given storm event and releasing it at a predetermined rate. Also known as a dry pond. In order not to fall under the requirements of Chapter 105, Dam Safety and Waterway Management, the following must be true:

A. The contributory drainage area may not exceed one hundred (100) acres.

B. The greatest depth of water measured by upstream toe of dam at maximum storage elevation may not exceed fifteen (15) feet.

C. The impounding capacity at maximum storage elevation may not exceed fifty (50) acre-feet.

Developer: Any landowner, agent of such landowner, or tenant with the permission of such landowner, who makes or causes to be made a subdivision of land or a land development, or any regulated activities covered by this Ordinance.

Development: Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, logging, excavation, or drilling operations.

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

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

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

Drainage Course: See "Drainage Conveyance Facility," and "Watercourse".

Drainageway: See "Drainage Conveyance Facility," and "Watercourse".

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

Drainage Easement: A right granted by a landowner to a grantee, allowing the use of private land for storm water management purposes. The property shall not have the right to use the land in a manner that violates the right of the grantee and/or the performance/function of the storm water management facility.

Earth Disturbance: Any activity including, but not limited to construction, mining, farming, timber harvesting, and grubbing which alters, disturbs and exposes existing land surfaces. (See "Land Disturbance Activity")

Energy Dissipator: A device used to slow the velocity of storm water particularly at points of concentrated discharge such as pipe outlets.

Enforcement Officer: The duly constituted municipal official designated to administer and enforce this Ordinance. The Enforcement Officer shall administer this Ordinance in accordance with its literal terms. The Enforcement Officer also may be the Building Inspector and/or Zoning Officer of the Township or other designated person, persons or consultant.

Engineer, Township: The Heidelberg Township Engineer or any consultant designated by the Board of Supervisors to review a Land Disturbance Plan and perform the duties of engineer on behalf of the Township.

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

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

Erosion and Sedimentation Control Plan: A plan that is designed to minimize accelerated erosion and sedimentation.

Existing Conditions: The initial condition of a Development Site prior to the proposed construction. If the initial condition of the site is undeveloped land, the land use shall be considered as "meadow" unless the natural land cover is proven to generate lower curve numbers or Rational "C" coefficient values, such as forested lands.

FEMA: The Federal Emergency Management Agency.

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

Flood Plain: The land adjoining a river or stream that has been or may be expected to be inundated with floodwaters in a one hundred (100) year frequency flood. The flood plain areas are identified on flood plain maps available at the Heidelberg Township Municipal Building. Also, the area of inundation which functions as a storage or holding area for floodwater to a width required to contain a base flood of which there is a one percent (1%) chance of occurrence in any given year. Additionally included are areas that compromise Group 13 Soils, as listed in Appendix A of the Pennsylvania Department of Environmental Protection (PaDEP) Technical Manual for Sewage Enforcement Officers (as amended or replaced from time to time by PaDEP)

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

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

Forest Management/Timber Operations: Planning and activities necessary for the management of forest land. These include timber inventory and preparation of forest management plans, silvicultural treatment, cutting budgets, temporary logging road design and construction of temporary logging road, timber harvesting, site preparation, reforestation, transporting and selling trees for commercial purposes all of which does not involve any land development and does not include clear cutting. Removal of tree stumps with earthmoving equipment will constitute a regulated activity.

Freeboard: A vertical distance between the maximum design highwater elevation and the top of a dam, levee, tank, basin, or diversion ridge.

Governing Body: The Board of Supervisors of the Township of Heidelberg, Lebanon County, Pennsylvania.

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

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

Ground Water: Subsurface water in a zone of saturation.

Groundwater Recharge: Replenishment of existing natural underground water supplies.

Grubbing: The clearing of land by digging up roots and stumps. This constitutes a Regulated Activity.

Holding Pond: A retention or detention basin.

Impervious Surface: Those surfaces that do not absorb rain. All buildings, including roof overhangs, parking areas, driveways, roads, sidewalks, and such areas as those in concrete and asphalt shall be considered impervious surfaces within this definition. In addition, other areas determined by the Township Engineer to be impervious within the meaning of this definition will also be classed as impervious surfaces.

Impoundment: A retention or detention basin designed to retain storm water runoff and infiltrate it into the ground (in the case of a retention basin) or release it at a controlled rate (in the case of a detention basin).

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

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

Land Development:

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

B. A subdivision of land.
C. Development in accordance with Section 503(1.1) of the PA Municipalities Planning Code.

Landowner: The legal or beneficial owner or owners of land including the holder of an option or contract to purchase (whether or not such option or contract is subject to any condition), a lessee if

he is authorized under the lease to exercise the rights of the landowner, or other persons having a proprietary interest in land.

Land Disturbance Activity: Any use involving the installation of ground cover, grading, filling or excavation of land; or the erection of a dwelling or other principal structure; or the modification, removal, filling, or alteration of an existing storm water management facility or drainage easement. Land disturbance activities shall be classified as follows:

A. Major Land Disturbance Activity:

1. Any use involving the diversion or piping of any natural or man-made watercourse or existing drainage pattern; or

2. Any use within the flood plain area; or

3. Any non-residential use involving the installation of impervious or semi-impervious surface, of more than three thousand five hundred (3,500) square feet at any time and/or in the aggregate or more than ten thousand (10,000) square feet, for the combination at existing and proposed impervious surface; or

4. Any non-residential use involving the removal of ground cover, grading, filling, excavation or destruction of woodland greater than or equal to one (1) acre, except for the agricultural use of land when operated in accordance with a Farm Conservation Plan approved by the Lebanon County Conservation District; or

5. Any non-residential development meeting the above requirement including but not limited to commercial, industrial, and institutional development; or

6. Any Land Disturbance activity not considered a Minor Land Disturbance Activity; or

7. The submission of a Subdivision* or Land Development Plan.

8. Forestry operations may be exempt in accordance with Appendix 26.

9. Linear Utility Line Maintenance operations are exempt in accordance with Appendix 26.

10. Wellhead protection areas are exempt from certain types of storm water management facilities as listed in Appendix 26 for specific Wellhead Protection Zones as shown on the drainage district mapping in Appendix 27.

B. Minor Land Disturbance Activity:

1. The use of land for any single-family residential purpose on an existing lot of record* provided that:

a. The use is not within a flood plain area; and

b. No diversion or piping of any natural or man-made watercourse or existing drainage pattern is involved; and

c. Such use does not involve the installation of impervious or semi-impervious surface of more than three thousand five hundred (3,500) square feet at any time and/or in the aggregate or does not exceed ten thousand (10,000) square feet, for the combination at existing and proposed impervious surface. (See Appendix 26 for exemption criteria for existing lands improved with existing residential use structures at the time of the adoption of this Ordinance.); and

d. Such use does not involve the removal of ground cover, grading, filling or excavation between two thousand (2,000) square feet and up to but not including one (1) acre.

e. Forestry operations may be exempt in accordance with Appendix 26.

2. Linear Utility Line Maintenance operations are exempt in accordance with Appendix 26.

3. Wellhead protection areas are exempt from certain types of storm water management facilities as listed in Appendix 26 for specific Wellhead Protection Zones as shown on the drainage district mapping in Appendix 27.

* A residential subdivision consisting of no more than one (1) new lot and remaining lands may also qualify as a Minor Land Disturbance Activity provided that items B. 1.c. and B. 1.d. are not exceeded and the subdivision is not part of a phased plan.

Land Disturbance Plan: A plan that is designed to minimize the impacts of a land disturbance activity.

Leach Ring: A subsurface storm water runoff detention facility consisting of a concrete structure (usually circular) with an open bottom and several perforations in the vertical concrete walls designed to allow detained storm water to percolate in to the ground rather than discharge overland. Also commonly referred to as a Leach Pit and/or Dry Well.

Lineament: A fracture on the order of tens of kilometers long, usually extending to the basement below sedimentary rock.

Main Stem (Main Channel): Any stream segment or other runoff conveyance facility used as a reach in both the Cocalico Creek and Tulpehocken Creek Hydrologic models.

Manning Equation (Manning Formula): A method for calculation of velocity of flow (e.g., feet per second) and flow rate (e.g. cubic feet per second) in open channels based upon channel

shape, roughness, depth of flow and slope. "Open channels" may include closed conduits so long as the flow is not under pressure.

Memorandum of Understanding: An agreement between Heidelberg Township and the Lebanon County Conservation District to provide for cooperation between the Lebanon County Conservation District and Heidelberg Township officials to include within its ordinances, and to jointly promote conservation of natural resources within Heidelberg Township on lands both public and private, for the purposes of preventing accelerated soil erosion and sedimentation of streams, reducing storm water damage, and promoting the health, safety and general welfare of the residents of Heidelberg Township.

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

Municipality: The Township of Heidelberg, Lebanon County, Pennsylvania.

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

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

NRCS: Natural Resources Conservation Service (previously SCS).

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

On-Lot Storm Water Management: A storm water management facility which is typical of serving a single residential property for the purpose of this Ordinance.

On-Site Storm Water Management: The control of runoff to allow water falling on a given site to be absorbed or detained on-site to the extent that after development the peak rate of discharge leaving the site is no greater than if the site had remained undeveloped.

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

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

Outlet: Point of water disposal from a stream, river, lake, tidewater or artificial drain.

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

Parent Tract: All contiguous land held in single and separate ownership, regardless of whether (I) such land is divided into one or more lots, parcels, purparts or tracts; (ii) such land was acquired by the landowner at different times or by different deeds, devise, partition or otherwise;

or (iii) such land is bisected by public or private streets or rights-of-way, which was held by the landowner or his predecessor in title on the effective date of this Ordinance.

PADEP: The Pennsylvania Department of Environmental Protection, former entity the Pennsylvania Department of Environmental Resources, or any agency successor to the Pennsylvania Department of Environmental Protection [Note: The Department of Environmental Resources was abolished by Act 18 of 1995].

PENNDOT: The Pennsylvania Department of Transportation or any agency successor thereto.

Peak Discharge: The maximum rate of flow of water at a given point and time resulting from a specified storm event.

Penn State Runoff Model (calibrated): The computer-based hydrologic modeling technique adapted to the Tulpehocken Creek Watershed for the Act 167 Plan. The model has been "calibrated" to reflect actual recorded flow values by adjoining key model input parameters.

Person: An individual, partnership, association, corporation or other legally recognized entity and the members of such partnership or association and the officers of such corporation.

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

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

Planning Commission: The Heidelberg Township Planning Commission. The Planning Commission is vested with the right to review and recommend action to the Board of Supervisors for all plans submitted to the Township.

Pond: A body of water.

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

Project Site: An area of land under land disturbance or development and within the jurisdiction of this Ordinance.
Rational Formula (Rational Method): A rainfall-runoff relation used to estimate peak flow.

Record Plan/Drawings: Where a regulated activity constitutes a subdivision or land development, the Final Subdivision or Land Development plan which contains the information the Ordinance requires. Where a regulated activity does not constitute a subdivision or land development, a Storm Water Management Plan containing all required information and prepared in a form acceptable to the Office of the Recorder of Deeds for recording.

Registered Professional: A person duly licensed as a professional engineer, surveyor, geologist or landscape architect by the Commonwealth of Pennsylvania.

Regulated Activities: Any activity or proposed activity to which this Ordinance is applicable pursuant to Section 104 of this Ordinance.

Retention Basin: A basin containing a permanent pool of water designed to store runoff for a given storm event with its primary release of water being through the infiltration of said water into the ground.

Return Period: The average interval, in years, within which a storm event of a given magnitude can be expected to recur. For example, the 25-year return period rainfall would be expected to recur on the average once every twenty-five years.

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

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

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

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

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

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

Sedimentation Control: The use of manmade or other methods to minimize accelerated erosion and sedimentation.

Sediment Basin: A temporary dam or barrier constructed across a storm water conveyance, i.e. swale, storm pipe outlet, etc. or at other suitable locations to intercept the runoff and to trap and retain the sediment.

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

Seepage Bed/Seepage Trench: A subsurface storm water runoff detention facility filled with loose clean stone or similar course material designed to allow detained storm water to percolate in to the ground rather than discharge overland. Also commonly referred to as an Infiltration Trench.

Semi-impervious Surface: A surface such as stone, rock, concrete or other material that prevents some percolation of water into the ground.

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

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

Soil Group, Hydrologic: A classification of soils by the Soil Conservation Service (now NRCS) into four runoff potential groups. The groups range from A soils, which are very permeable and produce little runoff, to D soils, which are not very permeable and produce much more runoff.

Spillway: A depression in the embankment of a pond or basin, which is used to pass a Post development 100-year storm peak flow rate. Spillways in the embankment of ponds or basins are generally used for emergency situations when the storm event exceeds the design outflow of the basin and/or when the primary outlet structure outflow pipe of the pond or basin is clogged. No storm water is to flow through a spillway during the normal function of the pond or basin.

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

Storm Frequency: The number of times that a given storm "event" occurs or is exceeded on the average in a stated period of years. See "Return Period".

Storm Sewer: A system of pipes, conduits, swales, or other similar structures including appurtenant works which carries intercepted runoff, and other drainage, but excludes domestic sewage and industrial wastes.

Storm Water: The total amount of precipitation or snow or ice reaching the ground surface.

Storm Water Management: A program of controls and measures, including BMPs, designed to convey and regulate the quantity and quality of storm water runoff from a development while promoting the protection and conservation of groundwaters and groundwater recharge.

Storm Water Management Act: The Pennsylvania Storm Water Management Act, Act of October 4, 1978, P.L. 864, No. 167, as amended, 32 P.S. §680.1 et seq.

Storm Water Management Facilities: Those controls and measures used to affect storm water management.

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

Storm Water Management Site Plan: The Plan prepared by the Developer or his representative indicating how storm water runoff will be managed at a particular site according to this Ordinance.

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

Street: A highway, road, avenue, lane, or alley, whether publicly or privately owned, which includes an impervious surface cartway.

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

Supervisors: The Heidelberg Township Board of Supervisors (Governing Body).

Swale: A natural channel or other low-lying stretch of land that collects or carries surface water runoff.

Tile Field (Tiling): The installation of subsurface drainage facilities (i.e. pipe, etc.) to drain areas otherwise affected by high groundwater levels.

Timber Operations: See "Forestry Operations".

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

Township: Heidelberg Township, Lebanon County, Pennsylvania, as represented by the Board of Supervisors, or its duly authorized agents.

Township Engineer: See "Engineer, Township".

Watercourse: A perennial or intermittent stream, river, brook, creek, run, channel, swale, pond, lake, or there body of surface water, carrying or holding surface water, whether natural or man-made, for gathering or carrying surface water from storm water runoff and/or from groundwater that has reached the surface of land.

A. Watercourse, Exceptional Value: A watercourse that has been designated as containing Exceptional Value Waters.

B. Watercourse, High Quality: A watercourse that has been designated as containing High Quality Waters.

C. Watercourse, Intermittent: A watercourse that alternately contains and is empty of water.

D. Watercourse, Man-made: Any watercourse designed and constructed as a land development improvement, including storm water drainage swales, retention basins, detention basins, farm ponds, canals, aqueducts, or other similar constructions.

E. Watercourse, Perennial: A watercourse that contains water throughout all seasons of the year.

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

Wetlands: Area 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. Wetlands include swamps, marshes, bogs, wet meadows and similar areas.

Wetland Delineation: The defined boundary between a wetland and an upland, in accordance with the Federal Manual for Identifying and Delineating Jurisdictional Wetlands, 1987.

ARTICLE III
DESIGN CRITERIA FOR STORM WATER MANAGEMENT FACILITIES

SECTION 301 GENERAL REQUIREMENTS

A. All regulated activities in either the Cocalico Creek or Tulpehocken Creek Watersheds which do not fall under the exemption shown in Appendix 26 shall submit a drainage plan consistent with either respective Watershed Plan to the Township for review. This criteria shall apply to the total proposed development even if the development is to take place in stages. Impervious cover shall include, but not be limited to, any roof, parking or driveway areas and any new streets and sidewalks. Any areas designed to initially be gravel or crushed stone shall be assumed to be impervious for the purposes of comparison to the exemption criteria.

B. Storm water drainage systems shall be provided in order to permit unimpeded flow along natural watercourses, except as modified by storm water management facilities or open channel consistent with this Ordinance.

C. The existing points of concentrated drainage that discharge onto adjacent property shall not be relocated and shall be subject to any applicable discharge criteria specified in this Ordinance.

D. Areas of diffused drainage discharge (overland flow) where the flow is increased or the character of flow has been altered (concentrated) shall be subject to any applicable discharge criteria specified in this Ordinance.

E. Where a Development Site is traversed by watercourses other than permanent streams, a drainage easement shall be provided conforming substantially to the line of such watercourses. The terms of the easement shall prohibit excavation, the placing of fill or structures, and any alterations that may affect adversely the flow of storm water within any portion of the easement. Also, maintenance and mowing of vegetation within the easement shall be required.

F. Chapter 105 applies to the construction, modification, operation or maintenance of both existing and proposed water obstructions and encroachments throughout the watershed, including work in wetlands. Inquiries on permit requirements or other concerns shall be addressed to PADEP's Regional Office. Permit requirements or inquiring on dam safety should be addressed to the PADEP, Bureau of Waterways Engineering - Harrisburg.

G. When it can be shown that, due to topographic conditions, natural drainage ways on the site cannot adequately provide for drainage, open channels may be constructed conforming substantially to the line and grade of such natural drainageways. Work within natural drainageways shall be subject to approval by PADEP through the Joint Permit Application process, or, where deemed appropriate by PADEP, through the General Permit process.

H. Carbonate Geology. In areas of carbonate geology, a Geologist shall certify the following:

1. No storm water facilities shall be placed in, over or immediately adjacent to the following features.

   a. sinkholes

   b. closed depressions

   c. lineaments in carbonate areas

   d. fracture traces

   e. caverns

   f. intermittent lakes

   g. ephemeral streams

   h. bedrock pinnacles (surface or subsurface)

   Such certification is not required in instances of residential dwelling construction on existing lots of record provided there is no visible evidence of sinkholes or closed depressions along with no known history of the occurrence of sinkholes relative to the parent tract from which the existing lot of record was subdivided from. However, in instances where percolation rates are obtained in excess of 6.0 in./hr. for an infiltration system such exemption shall not apply.

2. Storm water management basins shall not be located closer than one hundred (100) feet from the rim of sinkholes or closed depressions, nor within one hundred (100) feet from disappearing streams; nor shall these basins be located closer than fifty (50) feet from lineaments or fracture traces; nor shall these basins be located closer than twenty-five (25) feet from surface or identified subsurface pinnacles.

3. Storm water resulting from regulated activities shall not be discharged into sinkholes.

4. If the developer can prove through analysis that the site is in an area underlain by carbonate geology, and such geologic conditions may result in sinkhole formations, then the site is exempt from recharge requirements as described in Sections 302 C. and 307 G. However, the site shall still be required to meet all other hydrologic and water quality management standards as found in this Ordinance.

5. It shall be the developer's responsibility to verify if the site is/is not underlain by carbonate geology. The following note shall be attached to all Storm Water Management Site plans and signed and sealed by the developer's Geologist, "I,

_____, certify that the proposed detention basin (circle one) is/is not underlain by carbonate geology."

6. Whenever a storm water facility will be located in an area underlain by carbonate geology, a geological evaluation of the proposed location by a Geologist shall be conducted to determine susceptibility to sinkhole formation. The evaluation may include the use of impermeable liners to reduce or eliminate the separation distances listed in Sections 301 H.1. and 301 H.2.

   Such evaluation is not required in instances of residential dwelling construction on existing lots of record provided there is no visible evidence of sinkholes or closed depressions along with no known history of the occurrence of sinkholes relative to the parent tract from which the existing lot of record was subdivided. However, in instances where percolation rates are obtained in excess of 6.0 in./hr. for an infiltration system such exemption shall not apply.

I. Any storm water management facilities regulated by this Ordinance that would be located in or adjacent to waters of the Commonwealth or wetlands shall be subject to approval by PADEP through the Joint Permit Application process, or, where deemed appropriate by PADEP, the General Permit process. When there is a question whether wetlands may be involved, it is the responsibility of the Developer or his agent to show that the land in question cannot be classified as wetlands, otherwise approval to work in the area must be obtained from PADEP.

J. Any storm water management facilities regulated by this Ordinance that would be located on State highway rights-of-way shall be subject to approval by the Pennsylvania Department of Transportation (PENNDOT). Evidence of said approval shall be provided by the Developer.

K. Minimization of impervious surfaces and infiltration of runoff through seepage beds, infiltration trenches, etc. are encouraged, where soil conditions permit, to reduce the size or eliminate the need for detention facilities.

L. Storm water detention facilities and infiltration facilities are prohibited within the Wellhead Protection areas as shown on the drainage district mapping and per the Township Zoning Ordinance and the Wellhead Protection Program approved by PADEP on December 1, 2004. However, surface type Water Quality BMP facilities are required within these wellhead protection areas where surface runoff flows within an exceptional value or high quality watershed. Appendix 26 lists the specific facility prohibitions for specific wellhead protection zones that correlate to the drainage district mapping

SECTION 302 STORM WATER MANAGEMENT PERFORMANCE STANDARDS

A. Match Pre-existing Hydrograph

Developers and/or landowners are encouraged to provide infiltration facilities or utilize other techniques which will allow the post-development hydrograph to match the pre-existing hydrograph, along all parts of the hydrograph, for the site provided that flows from the site after development leave the site in the same manner as the pre-development condition and there are no adverse effects to the adjacent property(ies). This option is most feasible for small subdivisions in areas of non-carbonate geology. "Groundwater Recharge" and "Water Quality" volumes as given in Sections 302 C. and D. below can be used as part of this option. This preferred method is applicable only within the Cocalico Creek Act 167 Watershed Plan area.

B. Detention/Infiltration Standards

1. Post-development rates of runoff from any regulated activity shall not exceed the peak rates of runoff from the Storm Water Districts shown below prior to development for the design storms listed.

District	Design Storm Post-Development	Design Storm Pre-Development
Tulpehocken Creek Watershed		
A	2-Year	1-Year
	5-Year	5-Year
	10-Year	10-Year
	25-Year	25-Year
B1	2-Year	1-Year
	5-Year	2-Year
	10-Year	5-Year
	25-Year	10-Year
Cocalico Creek Watershed	2-Year	50 % of 2-Year *
	5-Year	50 % of 5-Year *
	10-Year	50 % of 10-Year *
	25-Year	50 % of 25-Year *
	50-Year	50 % of 50-Year *
	100-Year	50 % of 100-Year *

* This rate is only desirous if matching the pre-development hydrograph for all points along the hydrograph cannot be accomplished.

The boundaries of the above Districts are shown on a Drainage District Map included in Appendix 27. The exact location of the District boundaries as they apply to a given development site shall be determined by mapping the boundaries using two-foot topographic contours (actual field survey data) provided as part of the Drainage Plan.

2. Innovative methods for the control of storm water runoff are encouraged. Various combinations of methods should be tailored to suit the particular requirements of the type of development and the topographic features of the Development Site. The following is a partial listing of detention and control methods which can be utilized in storm water management systems where appropriate:

    a. detention basins

    b. retention basins (subject to prior municipal approval)

    c. rooftop detention

    d. parking lot storage

    e. seepage pits, seepage trenches or other infiltration structures

    f. concrete lattice block surfaces

    g. grassed channels and vegetated strips

    h. cisterns and underground reservoirs

    I. routed flow over grass

    j. decreased impervious surface coverage

    k. bio-retention areas

3. The following principles shall be applied to the Erosion and Sediment Pollution Control Plan and construction schedule to minimize soil erosion and sedimentation:

    a. Stripping of vegetation, grading, or other soil disturbance shall be done in a manner which will minimize soil erosion.

    b. Whenever feasible, natural vegetation shall be retained and protected.

    c. The extent of the disturbed area and the duration of its exposure shall be kept to a minimum, within practical limits.

d. Either temporary seeding, mulching, or other suitable stabilization measures shall be used to protect exposed critical areas during construction.

e. Drainage provisions shall accommodate the storm water runoff both during and after construction.

f. Soil erosion and sedimentation facilities shall be installed prior to any on-site grading.

C. Groundwater Recharge

Developed areas shall maintain groundwater recharge consistent with pre-development conditions, dependent on hydrologic soil groups and impervious cover unless the developer can prove the inability of the site to achieve recharge based on existing site conditions. This volume of runoff is termed the "Recharge Volume" and is calculated in accordance with Section 307 G.2. The Recharge Volume must be infiltrated in no less than 36 hours, but no more than forty-eight (48) hours after the end of the design storm. Watersheds where the post developed impervious area is equal to or less than the pre developed impervious area shall not be required to provide Ground Water Recharge volume.

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

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

Evaluation by a Geologist is not required in instances of residential dwelling construction on existing lots of record provided there is no visible evidence of sinkholes or closed depressions along with no known history of the occurrence of sinkholes relative to the parent tract from which the existing lot of record was subdivided from. However, in instances where percolation rates are obtained in excess of 6.0 in./hr. for an infiltration system such exemption shall not apply.

D. Water Quality

Developed areas will provide adequate storage and treatment facilities necessary to capture and treat a minimum of the runoff from the first 1.2" of rainfall. This volume of storage is the "Water Quality Volume" and is calculated in accordance with Section 307 H.4. The Recharge Volume may be a component of the Water Quality Volume. If the Recharge Volume is less than the Water Quality Volume, the remaining Water Quality Volume may be captured and treated by methods other than recharge/infiltration BMPs. The Water Quality volume must take a minimum of twenty-four (24) hours to be discharged with a 36-hour maximum duration. Watersheds where the post-developed impervious area is equal to or less than the pre-developed impervious area shall not be required to provide Water Quality volume unless required by NPDES Part II.

E. Storm Water Conveyance Corridor Protection (riparian corridor preservation and vegetation) - Runoff from developed areas of the site, including but not limited to areas of impervious surface, shall be managed through a series of riparian corridor vegetation facilities whenever possible. This will be accomplished in a manner satisfactory to the Township, utilizing the "Pennsylvania Handbook of Best Management Practices for Developing Areas", 1998, Riparian Forested Buffer, and the priority goal of the riparian vegetation will be the reduction of thermal impacts on storm water runoff associated with impervious areas, with a secondary goal being the protection of capacity of existing storm water conveyance channels. These goals will be achieved through the use of design criteria in Section 303 and 307 I. of this Ordinance and shall be in addition to any other municipal ordinance provisions.

F. Sub-Regional (Combined Site) Storage

Runoff can be managed regionally by one or more developers, either on-site or off-site. The design and release rate shall be consistent with the Cocalico Creek Act 167 Plan and/or the Tulpehocken Creek Act 167 Plan. "Groundwater Recharge" and "Water Quality" volumes as described in Sections 307 G.2. and 307 H.4. will be a part of this option.

G. The "No Harm" option does not apply to the water quality requirement described in Section 302 D. The "No Harm" option does not apply to the groundwater recharge requirement described in Section 302 C., unless it can be shown that the site is underlain by carbonate geology and infiltration cannot be safely accomplished.

For any proposed development, the developer has the option of using a less restrictive runoff control if the developer can prove that "no harm" would be caused by discharging at a higher runoff rate than that specified by the Plan. Proof of "no harm" would have to be shown from the development site through the remainder of the downstream drainage network until there is no additional flow increase. Proof of "no harm" must be shown using the capacity criteria specified in Section 304 A. and 304 B. if downstream capacity analysis is a part of the "no harm" justification.

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

1. The peak flow values to be used for downstream areas for the design return period storms (2-, 5-, 10-, 25-, 50-, and 100-year) shall be the values from the calibrated TR-20 Model for the Cocalico Creek Watershed or the calibrated model for the Tulpehocken Creek Watershed. These flow values shall be requested by the developer from Lancaster County for the Cocalico Creek Watershed calibrated model and from Lebanon County for the Tulpehocken Creek Act 167 Watershed Plan.

2. At peak flow, any available capacity in the downstream conveyance system (as documented by a developer) may be used only in proportion to the proposed development site acreage relative to the total upstream undeveloped acreage (i.e. if the site is 10% of the upstream undeveloped acreage, the developer may use up to 10% of the documented downstream available capacity at peak flow).

3. Developer-proposed runoff controls which would generate increased peak flow rates at documented storm drainage problem areas would, by definition, be precluded from successful attempts to prove "no harm," except in conjunction with proposed capacity improvements for the problem areas consistent with Section 304 A. and 304 B. of this Ordinance.

4. A financial shall distress shall not constitute grounds for granting approval of a "No harm" option.

5. Capacity improvements may be provided as necessary to implement the "no harm" option, which proposes specific capacity improvements to provide that a less stringent discharge control would not create any harm downstream.

   All proposed capacity improvements to downstream facilities must comply with the following additional requirements:

   a. Natural or man-made channels or swales must be clearly able to convey the increased runoff associated with a 2-year return period event within their banks at velocities consistent with protection of channels from erosion. Acceptable velocities shall be based upon criteria included in the DEP *Erosion and Sediment Pollution Program Manual.*

   b. Natural or man-made channels or swales must be able to convey increased 25-year return period runoff without creating any hazard to persons or property.

   c. Culverts, bridges, storm sewers or any facilities which must pass or convey flows from the tributary area must be designed in accordance with PADEP Chapter 105 regulations (if applicable) and, at minimum, pass the increased 25-year return period runoff.

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

H. The following general standards shall be applied to all development within Heidelberg Township to promote flow attenuation, erosion and sediment control and flood control:

1. The developer of any site developments in the Cocalico Creek Watershed Plan Area and/or the Tulpehocken Creek Watershed Plan Area which does not fall under the exemption criteria in Appendix 26 shall submit a Storm Water Management Site plan consistent with the Cocalico Creek Watershed Act 167 Plan and/or the Tulpehocken Creek Watershed Act 167 Plan to the Township for review.

   The exemption criteria in Appendix 26 shall apply to the total proposed development on a parent tract even if development is to take place in stages. Impervious cover shall include, but not be limited to, any roof, parking or driveway areas and any new streets and sidewalks. Any areas designed to initially be gravel or crushed stone shall be assumed to be impervious.

2. All storm water management site plans shall be designed and certified by individuals registered in the Commonwealth of Pennsylvania and qualified to perform such duties based on education and training in hydrology and hydraulics.

3. Runoff from impervious areas shall be drained to pervious areas of the Development Site.

4. Roof drains shall not be connected to streets, sanitary or storm sewers or roadside ditches. To the maximum amount possible roof drains shall discharge to infiltration areas and/or vegetative BMPs.

5. Storm water management facilities which involve a State Highway shall be subject to the approval of the PENNDOT.

6. Storm water management facilities located within or affecting the floodplain or any watercourse shall also be subject to the requirements of Section 309 (Floodplain) of this Ordinance, the Zoning Ordinance, any other Ordinance which regulates construction and development within areas of Heidelberg Township subject to flooding, and any other applicable requirements of the Floodplain Management Act.

7. Storm water runoff from a Development Site shall flow directly into a natural watercourse, into an existing storm sewer system, or onto adjacent properties in a manner similar to the runoff characteristics of the pre-development flow. Maximum use shall be made of the existing on-site natural and man-made storm water management facilities.

8. Storm water runoff shall not be transferred from one watershed to another unless they are sub-watersheds of a common watershed which join together within the perimeter of the Development Site, or the effect of the transfer does not alter the peak discharge (in conformance with the requirements of the Act 167 Plan) onto adjacent lands, or drainage easements from the affected landowners are provided.

9. All storm water runoff flowing over the Development Site shall be considered in the design of the storm water management facilities.

10. The following shall meet the requirements of this Ordinance:

    a. A Subdivision or Land Development.

    b. Any Land Disturbance not included in the exemptions found in Appendix 26.

    c. The Final Plan applications are submitted in sections.

    d. Temporary facilities are required for construction of a section.

       Such temporary facilities shall be included in the submitted plans for that section in accordance with PADEP Chapter 102.

SECTION 303 DESIGN CRITERIA FOR STORM WATER MANAGEMENT FACILITIES - DETENTION AND RETENTION

A. Any storm water management facility designed to store storm water runoff and requiring a berm or earth embankment (i.e. detention or retention basin) shall be designed to provide an emergency spillway to handle the 100-year post-development peak flow rate. The height of embankment must be set to provide a minimum 1.0 foot of freeboard above the maximum elevation computed when the entire 100-year peak flow passes through the spillway. However, criteria for design and construction of storm water management facilities are not the same criteria that are used in the permitting of dams under the PADEP Dam Safety Program. Depending upon the physical characteristics of a dam, a dam permit may be required and the design will have to meet the provisions of Chapter 105. Depending on the physical characteristics of a dam, the design could require that anywhere from a 100-year to a Probable Maximum Flood (PMF) storm event be considered. The following minimums shall be required:

1. The maximum water depth shall not exceed six (6) feet, unless approved by a modification granted in conformance with Section 408.

2. The minimum top width of all dams/embankments/berms shall be eight (8) feet.
3. The interior side slopes shall not be greater than five (5) horizontal to one (1) vertical.

4. The exterior side slopes shall not be greater than three (3) horizontal to one (1) vertical.

5. All basins shall be structurally sound and shall be constructed of sound and durable materials. The completed structure and the foundation of all basins shall be stable under all probable conditions of operation. An emergency spillway shall be provided for the basin and shall be capable of discharging the 100-year peak rate of runoff which enters the basin after development, in a manner which will not damage the integrity of the facility and will not create a downstream hazard. Where practical, the emergency spillway shall be constructed in undisturbed ground. An easement for inspection and repair shall be provided when the conveyance structure crosses property boundaries.

6. All basins not including Groundwater Recharge and/or Water Quality storage shall include an outlet structure to permit draining the basin to a completely dry position within twenty-four (24) hours following the end of the design rainfall. All basins that do include Groundwater Recharge and/or Water Quality storage shall include an outlet structure to permit draining the basin to the level of the Groundwater Recharge and/or Water Quality storage within twenty-four (24) hours following the end of the design rainfall.

7. A cutoff trench of relatively impervious material (clay core and key trench) shall be provided within all basin embankments.

8. All structures passing through basin embankments shall have properly spaced concrete cutoff collars and all piping must be watertight.

9. All discharge control devices with appurtenances (except discharge pipes) shall be made of reinforced concrete and stainless or hot dip galvanized steel. Bolts/fasteners are to be stainless or galvanized steel. Discharge pipes shall conform to the requirements of Section 304 H. below.

10. Low flow channels shall be provided from each water carrying facility to the outlet structure for all basins that do not include Groundwater Recharge and/or Water Quality storage. Low flow channels shall be one (1) percent minimum slope and shall be designed to enable ease of maintenance. All basins that do include Groundwater Recharge and/or Water Quality storage shall not be required to have a low flow channel. Low flow channels must be made of concrete where the slope of the channel is from one (1) percent to one and one-half (1 1/2) percent. Low flow channels may be constructed of grass where the slope exceeds one and one-half (1 1/2) percent and the geological analysis of the site area would allow such a grass lined channel without the creation of sinkholes.

11. Minimum slope within a basin that does not include Groundwater Recharge and/or Water Quality storage shall be two percent (2%) positive grade to the low flow channel.

12. Design storms for the computation of retention basins (where approved) volumes shall be based upon a 24-hour storm with 100-year return period (a storm with a one percent (1%) chance of occurrence each year).

13. The effect on downstream areas if the basin embankment fails shall be considered in the design of all basins. Where possible, the basin shall be designed to minimize the potential damage caused by such failure of the embankment.

14. All structures (detention basins, cisterns, etc.), other than those used for Groundwater Recharge Volume and Water Quality Volume, must completely drain within twenty-four (24) hours after the end of the design storm.

15. Soils used for the construction of basins shall have low erodibility factors ("K" factors).

B. Minimum floor elevations for all structures that would be affected by a basin, other temporary impoundments, or open conveyance systems where ponding may occur shall be two (2) feet above the 100-year water surface. If basement or underground facilities are proposed, detailed calculations addressing the effects of storm water ponding on the structure and water-proofing and/or flood-proofing design information shall be submitted for approval.

C. All outlet structures and emergency spillways shall include a satisfactory means of dissipating the energy of flow at its outlet to insure conveyance of flow without endangering the safety and integrity of the basin and the downslope drainage area.

D. No outflow from a detention basin shall discharge directly onto or be conveyed onto a public road. Discharge into a culvert under, or storm sewer along a public road is acceptable provided that the applicant provides evidence of adequate capacity in the culvert or storm sewer.

E. Appropriate easements to enclose and permit access to all detention and retention facilities shall be provided.

F. Surface retention systems (retention basins) for storm water volume and/or infiltration volume and/or water quality volume shall incorporate the following additional minimum design standards:

1. Surface infiltration systems greater than three (3) feet in depth shall be located no less than thirty (30) feet from any basement wall.

2. Surface infiltration systems designed to handle runoff from commercial or industrial impervious parking area shall be no closer than one-hundred (100) feet from any water supply well.

3. Surface infiltration systems shall not receive runoff until the entire contributory drainage area to the infiltration system has received final stabilization.

4. The storm water management facility shall provide an emergency overflow system with measures to provide a non-erosive velocity of flow along its length and at the outfall.

5. Surface infiltration systems for paved areas shall utilize some means of pre-filtering (i.e. a 20-foot or greater grass strip, oil grit separator, or other standard practice) to prevent grits from clogging the system.

G. Sub-Surface retention systems (seepage beds, leach-rings, infiltration trench) used for storm water volume and/or infiltration volume and/or water quality volume shall incorporate the following additional minimum design standards:

1. Seepage beds shall not be located closer than ten (10) feet from any on-lot septic system. In the cases of elevated sand mounds, the distance shall be measured from the toe-of-slope of the sand mound.

2. Every seepage bed shall be provided with an emergency overflow/spillway. The overflow shall be capable of conveying the flow of a 100-year event from the area contributing to the seepage bed. The overflow shall be designed to discharge away from buildings and other structures and toward existing channels or storm water facilities.

3. The following information shall be provided for the design of the seepage bed:

a. All calculations and assumptions used in the design of the seepage bed shall be submitted to the Township for review. The calculations indicate the discharge/percolation rate as determined by actual percolation or permeability tests.

b. Sufficient details showing the construction of the seepage bed. The details should include bed dimensions, aggregate size, percentage of voids, type and limits of geotextile, etc.

c. The Township shall have the right to reject materials and methodology not proven to meet the standards contained herein.

4. The tops sides of all seepage beds shall be lined with geotextile material to prevent the migration of soil particles into the bed aggregate.

5. All seepage beds shall be provided with clean-outs for the primary bed feed lines.

6. Seepage beds that are intended to collect surface runoff from areas other than roofs shall be provided with protection from sedimentation within the seepage bed. Inlets for seepage beds shall have a minimum twenty-four inch (24") sump below the intake to the seepage bed.

7. As with conventional detention/retention procedures facilities, seepage beds shall be included in a storm water management easement.

8. Specific seepage bed maintenance procedures shall be defined on the plan sheet intended to be recorded.

H. Cisterns may be used in lieu of conventional storm water detention/retention facilities provided that the following criteria are met:

1. The proposed use of the structures directing runoff to the cistern is agricultural or residential in nature.

2. The property use will draw from the cistern on a daily basis. The daily basis draw shall not be less than five percent (5%) of the total volume of the cistern.

3. An alternate supply of water is available for the property use during dry periods.

4. The cistern shall collect only roof water from the buildings it serves. All other areas shall use more conventional methods of detention/retention if necessary.

I. Cisterns shall be designed to store the runoff volume of a 100-year storm event for the area served by the cistern.

J. Every cistern shall be constructed of concrete.

K. Every cistern shall be provided with a suitable access for maintenance purposes. The access shall not be less than twenty-four inches (24") in diameter, or, in the case of square or rectangular access points, shall not be less than twenty-four inches (24") measured along the shortest side of the access. All access points shall be located outside of buildings and shall be secured (locked) at all times other than for normal maintenance.

L. Every cistern shall be provided with an emergency overflow/spillway. The overflow shall be capable of conveying the flow of a 100-year event from the area contributing to the cistern. The overflow shall be designed to discharge away from buildings and other structures and toward existing natural or man made channels or storm water facilities.

M. The following information shall be provided for the design of the cistern:

1. All calculations and assumptions used in the design of the cistern shall be submitted to the Township for review. The calculations should indicate the proposed use of water drawn from the cistern and the rate at which the water will be drawn.

2. Sufficient details showing the method proposed to draw water from the cistern.

3. Structural details of the cistern.

N. Cisterns shall not be used as a source of potable drinking water.

SECTION 304 DESIGN CRITERIA FOR STORM WATER MANAGEMENT FACILITIES - COLLECTION AND CONVEYANCE

A. The design of storm water management collection and conveyance facilities that service drainage areas within the site shall be based upon a twenty-five (25) year storm frequency event. Storm water management facilities that convey off-site storm water through the site must be designed to convey a fifty (50) year event.

B. All developments must also include design provisions that allow for the overland conveyance of the post Q100 year storm flows through the site without damage to any private or public property. Additionally, on parcels with existing watercourses drainage easements shall be provided to contain and convey the 100-year frequency flood throughout the Development Site. Drainage easements for existing watercourses through a project site shall begin at the furthest upstream property line of the proposed Development Site in a watershed and continue along to the downstream property line where the existing stream leaves the project site.

C. When the design of the overall Land Disturbance Plan requires a transfer of watershed, as outlined by Section 302 H.8. of this Ordinance, the design shall illustrate that the facilities utilized to accomplish the transfer can safely convey the 100-year post-development storm event. Transfers into any adopted Act 167 study areas with different allowable runoff rate and/or runoff volume requirements is prohibited.

D. The capacities of the pipes, gutters, inlets, culverts, outlet structures, and swales shall consider all possible hydraulic conditions. The following minimum design standards have been established by the Township.

1. For grass swales and roadside gutters two (2) design considerations shall be met: the first shall consider channel velocity and stability based upon a low degree of retardance ("n" of .03); the second shall consider channel capacity based upon a high degree of retardance ("n" of .05).

2. The "n" factors to be used for paved or riprap swales or gutters shall be based on accepted engineering design practices.

3. The following chart shall be used to determine the "n" factors for fully asphalt coated corrugated metal pipe:

	"n" factors			
Pipe Diameter	Helical		Annular	
(inches)	Capacity	Velocity	Capacity	Velocity
up to 18	.017	.014	.026	.024
21 through 30	.021	.017	.026	.021
larger than 30	.026	.019	.026	.019

4. The "n" factor for concrete or any other smooth pipe shall be 0.010 for velocity and 0.013 for capacity.

5. The velocity to be used in the design of any piped storm water conveyance system shall be based on the maximum velocity obtainable, but in no instance shall be less than a minimum velocity of two (2) feet per second when flowing full. The capacity shall be based upon full flow conditions.

6. Inlets, culverts, and basin discharge systems shall be designed for the worst-case condition. Inlet capacity shall be based on design data provided by the manufacturers. If acceptable information is not available, inlets in non-ponding areas shall be designed for a maximum capacity of four (4) cubic feet per second (cfs). Where ponding occurs, inlet capacity shall be based on accepted engineering design practices. Culvert design shall consider either inlet/outlet control or a combination of hydraulic losses through the system, whichever is greater. Basin discharge systems shall be designed to the same standards as culverts. If it cannot be readily determined which hydraulic condition controls, the basin discharge rate shall be based on the highest possible discharge rating curve with the basin capacity sized to store the excessive storm runoff based on the lowest possible discharge rating curve.

E. Manholes and inlets, when proposed, shall not be spaced more than four hundred (400) feet apart. Additionally, manholes shall be placed at points of abrupt changes in the horizontal or vertical direction of storm sewers. Inlets shall be substituted for manholes where they will serve a useful purpose. Where pipe sizes increase, the crown of piping shall match rather than the inverts of both so as to aid in hydraulic efficiency.

F. Inlets shall be placed on both sides of the street at low spots and at points where the flow in gutters exceeds three (3) inches. Inlets shall normally be along the curb line at or beyond the curb radius points. For the purpose of inlet location at corners, the depth of flow shall be considered for each gutter. At intersections, the depth of flow across the through streets shall not exceed one and one-half (1 ½) inches. At driveways, the depth of flow across the entrance of the driveway shall also not exceed one and one-half (1 ½) inches.

G. Curves in pipes or box culverts without an inlet or manhole are prohibited. Tee joints, elbows, and wyes are also prohibited.

H. Storm water management pipe collection and conveyance systems shall have a minimum diameter of fifteen (15) inches and shall be made of reinforced concrete pipe (RCP), fully polymer coated corrugated galvanized metal pipe (PCCMP), corrugated aluminized metal pipe (CAMP), smooth lined high density polyethylene pipe (HDPE) or Smooth Lined Corrugated Polyethylene Pipe (SLCPP), or polyvinyl chloride pipe (PVC). Where installation depths exceed fifteen (15) feet from ground surface to the crown of the pipe structural calculations that address the actual design requirements will be required.

I All storm sewer pipe and culverts shall be laid to a minimum depth of one (1) foot from finished subgrade to the crown of pipe in paved areas, unpaved vehicular areas and one (1) foot from finished grade to the crown of pipe in grassed areas.

J. All storm sewer pipes, culverts, manholes, inlets, endwalls and endsections shall be constructed in accordance with Pennsylvania Department of Transportation, Form 408, as amended.

K. Storm sewer pipes, culverts, manholes, inlets, endwalls, and endsections proposed for dedication or located along streets shall conform to the requirements of the Pennsylvania Department of Transportation, Bureau of Design, Standards for Roadway Construction, Publication No. 72, in effect at the time the design is submitted, as modified by the adopted Township construction standards.

L. Inlets shall be depressed two inches (2") below the grade of the street gutter or ground surface. Inlets used in ground areas will have their tops installed level. Inlets used along curbed streets shall have their tops installed at a grade equal to the street or curb grade.

M. In residential areas bicycle safe grating shall be utilized with all storm water inlets.

N. Where storm sewers exceed fifteen percent (15%) slope, properly spaced concrete anchors will be used.

O. Roof drains, sump pumps, and pipes, shall not directly discharge water into a street right-of-way or discharge into a sanitary sewer or storm sewer. To the maximum extent possible roof drains shall discharge to infiltration areas or vegetative BMPs. When it is more advantageous to connect directly to streets or storm sewers, roof drain connections to streets or roadside ditches may be permitted on a case-by-case basis by the Township. It shall be the burden of the person seeking to make the connection to demonstrate to the Township that such connection is more advantageous and such connection shall not violate any state or federal statute, rule or regulation. Proposed storm sewer piping may connect to an existing storm sewer piping system provided the existing storm sewer is adequate.

P. All storm pipe, other than culverts for existing channels, which discharge from residential lots to a street or from a street to residential lots shall extend from the street right-of-way a minimum distance of two-thirds (2/3) the length of the longest adjacent lot dimension.

Q. The proposed storm water discharge at the perimeter of the site shall not be beyond the capacity of any existing, immediately contiguous, storm water management facility into which it flows.

R. All existing and natural watercourses, channels, drainage systems and areas of surface water concentration shall be maintained in their existing condition unless an alteration is approved by the Township.

S. Flow velocities from any storm sewer may not result in a deflection of the receiving channel.

T. All storm drainage open channels, swales, detention and retention basins and areas of surface water concentration shall be seeded and hydro-mulched to the limits of the easement or right-of-way in which the facility is located.

U. In residential areas protective grating shall be provided at all headwalls and endwalls for pipe openings greater than twenty-four (24) inches in diameter to prevent clogging and unauthorized access to storm water facilities. Grating shall be provided in a manner similar to the detail provided in Appendix 11 of this Ordinance.

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

W. All storm sewer piping connections shall be constructed with watertight joints of a type approved by the Township Engineer. This requirement shall be so noted and/or detailed on any plans.

X. Storm pipes that discharge to a detention or retention basin shall be located as to outlet directly to the basin floor.

Y. Headwalls and endwalls shall be used where storm water runoff enters or leaves the storm sewer horizontally from a natural or manmade channel. PENNDOT Type "D" and "DW" headwalls and endwalls shall be utilized. HDPE Endsections may be used in place of these types of structures where deemed appropriate by the Township. CMP Endsections shall not be used.

Z. Energy dissipators (outlet protection) shall be placed at the outlets of all storm sewer pipes in keeping with the PADEP March 2000 Erosion and Sedimentation Pollution Control Manual, as amended.

AA. Adequate erosion protection shall be provided along all open channels, and at all points of discharge. This shall include but not be limited to rip rap lining, geo-textile lining, and vegetative lining.

BB. Storm facilities not located within a public right-of-way shall be centered within an easement having a minimum width of eighteen (18) feet plus the top width of a swale or outside diameter of a pipe, or twenty (20) feet, whichever is greater.

CC. In situations where the requirements of Section 302 H.7. cannot be met (burden of proof must be provided by the applicant and approved by the Township Engineer on a case by case basis) a concentrated discharge of storm water to an adjacent property shall be within an existing watercourse, provided velocities are not so high as to erode the stream banks as per Section 303 M. In instances where an existing watercourse is not present and the requirements of Section 302 H.7 cannot be met, an easement shall be required and obtained with the approval of the adjacent downstream property owner to be affected by such easement. Facilities that can satisfactorily convey the runoff from a 25-year storm frequency event through the said easement to the next available existing watercourse or existing storm water management conveyance facility shall be provided at the sole expense of the applicant and approved by the Township Engineer. In the event that the adjacent downstream property owner does not allow such an easement across/through their property the requirements of Section 302 H.7. shall remain.

DD. Storm sewer pipes, other than those used as roof drains, detention basin underdrains and street subbase underdrains, shall have a minimum diameter of fifteen (15) inches and be made of reinforced concrete pipe; polymer coated, aluminized or galvanized helically corrugated metal pipe***; smooth lined corrugated polyethylene pipe; or, approved equivalent. Where pipe sizes exceed seventy-two inches (72") in diameter, structural calculations that address the actual design requirements will be required.

*** 16 Gauge for 15" to 24" Diameter
14 Gauge for 27" to 42" Diameter
12 Gauge for 48" to 72" Diameter

EE. Roof drains, sump pumps, and pipes, shall not directly discharge water into a street right-of-way or discharge into a sanitary sewer or storm sewer. To the maximum extent possible roof drains shall discharge to infiltration areas or vegetative BMPs. When it is more advantageous to connect directly to streets or storm sewers, roof drain connections to streets or roadside ditches may be permitted on a case-by-case basis by the Township. It shall be the burden of the person seeking to make the connection to demonstrate to the Township that such connection is more advantageous and such connection shall not violate any state or federal statute, rule or regulation. Proposed storm sewer piping may connect to an existing storm sewer piping system provided the existing storm sewer is adequate.

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

1. Capacities and velocities shall be computed using the Manning equation. The design parameters shall be as follows:

a. Vegetated swales shall meet the following two design considerations:

(1) the first shall consider swale stability based upon a low degree of retardance ("n"=.03);

(2) the second shall consider swale capacity based upon a high degree of retardance ("n"=.05).

All vegetated swales shall have a minimum slope of one (1) percent unless approved by the Township.

b. The "n" factors to be used for paved or rip-rap swales or gutters shall be based upon accepted engineering design practices as approved by the township.

2. All swales shall be designed to concentrate low flows to minimize siltation and meandering.

GG. Storm Water Conveyance Improvements - If the Developer can prove under the "No Harm Option" of the Act 167 Plan that it would be feasible to provide conveyance improvements (install or upgrade pipes, bridges, swales, etc.) to relieve existing deficiencies as defined by Section 303 C. and any Local, State, or Federal regulations, the conveyance improvements could be provided by the Developer in lieu of storm water management facilities on the Development Site. Any conveyance improvements shall be designed based on the eventual development of all areas tributary to the improvements and the conveyance criteria specified in this Ordinance. The eventual development of all tributary areas that the Developer must consider shall either be based on the current zoning or be established by the Township, whichever results in a greater amount of impervious surface. It shall be assumed that all new development upstream of a proposed conveyance improvement would implement applicable storm water management techniques, consistent with this Ordinance.

HH. All groundwater recharge facilities shall be designed to empty in forty-eight (48) hours subsequent to any storm event. All water quality facilities shall be designed so that water is released slowly for a minimum of twenty-four (24) hours subsequent to any storm event. All infiltration, detention or retention facilities used for storm water management (pre vs. post) shall be designed to empty within twenty-four (24) hours subsequent to any storm event.

II. Where any regulated activity involves the construction of a driveway and/or private street and involves storm water management facilities, the Heidelberg Township Driveway Ordinance No. 25, as amended, and Heidelberg Township Private Street Ordinance No. 101, as amended, shall also apply with respect to storm water management facilities.

JJ. Considering areas of by-pass post-development storm water runoff (e.g., post-development runoff not directed toward a BMP and/or Recharge facility and/or detention facility) as a result of development site configuration and/or grading or re-arrangement of watershed areas, the storm water discharge from the said perimeter of the site at said area shall not be

beyond the capacity of any existing, immediately contiguous, storm water management facility into which it flows.

SECTION 305 DESIGN CRITERIA FOR STORM WATER MANAGEMENT FACILITIES - EROSION AND SEDIMENTATION CONTROL

A. The applicant must comply with the Erosion Control Rules and Regulations of Title 25 Rules and Regulations, Part I. PADEP, Subpart C. Protection of Natural Resources, Article II. Water Resources, Chapter 102, Erosion Control, as amended.

B. The design plan and construction schedule shall incorporate measures to prevent soil erosion and sedimentation.

C. The following principles shall be applied to the design plan and construction schedule to minimize soil erosion and sedimentation.

1. Erosion and Sedimentation Controls designed in conformance with the PADEP Erosion and Sedimentation Pollution Control Program Manual shall be implemented during the construction and post-construction periods to prevent soil erosion, sedimentation, and other pollutants from entering streams, lakes, etc.

2. Natural vegetation shall be retained and protected on all undisturbed areas.

3. The extent of the disturbed area and the duration of its exposure shall be kept to a minimum. Stockpiles to remain in place longer than twenty (20) days shall be seeded.

4. It shall be the applicant's responsibility during construction to prevent soil pollution to neighboring property, public streets, and streams. Soil dropped from construction equipment and sedimentation shall be immediately removed from roads, public and private property, and streams.

5. Drainage provisions shall accommodate the storm water runoff both during and after construction.

6. Soil erosion and sedimentation facilities shall be installed prior to any on-site earth disturbance.

D. The maximum swale, gutter, or curb velocity of storm water runoff shall be maintained at levels, which result in a stable condition both during and after construction.

The following are considered characteristics of a stable condition:

1. It neither aggrades nor degrades the condition of the channel.

2. The channel banks do not erode to the extent that the channel cross-section is changed.

3. Sediment bars do not develop.

4. Erosion does not occur around culverts and bridges or elsewhere.

5. Gullies do not form or enlarge due to the entry of uncontrolled storm water runoff.

E. Grass lined channels shall be considered stable if the calculated velocity does not exceed the allowable velocities shown below:

1. Three (3) feet per second where only sparse vegetation can be established and maintained because of shade or soil condition.

2. Four (4) feet per second where normal growing conditions exist and vegetation is to be established by seeding.

3. Five (5) feet per second where a dense, vigorous sod can be quickly established or where water can be temporarily diverted during establishment of vegetation. Jute matting and mulch shall be used for establishing vegetation.

4. Six (6) feet per second where there exists a well established high quality sod.

F. Where swale bends occur, the allowable velocities listed above shall be divided by the following factors:

1.	Swale bends 0 to 30 degrees	1.50
2.	Swale bends 30 to 60 degrees	1.75
3.	Swale bends 60 to 90 degrees	2.00
4.	Swale bends 90 degrees and over	2.50

The method of erosion protection proposed must be supported by design information and/or references.

G. Flow velocities from any storm sewer may not result in a deflection of the receiving channel.

H. Energy dissipators (outlet protection) shall be placed at the outlets of all storm sewer pipes, culverts, and bridges in keeping with the PADEP March 2000 Erosion and Sedimentation Pollution Control Manual, as amended.

SECTION 306 DESIGN STANDARDS – BEST MANAGEMENT PRACTICES (BMP)

A. Best Management Practices (BMPs) shall be implemented in Heidelberg Township in order to protect the Township's water quality. BMPs shall be applied to all subdivision and land development plans and other activities regulated by the Storm Water Management and Earth Disturbance Ordinance. The goal of BMPs is to improve the water quality of surface runoff entering the waterways, streams and creeks thereby improving other watershed resources. These goals and the related runoff characteristics include:

1. Infiltration of the majority of annual rainfall to replenish the water table and provide stable base flow to streams.

2. Physical and biological filtration of runoff to provide a clear and pollution free source of runoff to watercourses and other water bodies.

3. Moderation of runoff peak velocities to minimize erosion and damage to aquatic habitat in downstream areas.

This philosophy stresses preserving natural storage, infiltration and pollutant-filtering functions where practical. BMPs are created to provide permanent water quality treatment compared to the typical temporary erosion and sedimentation control facilities provided during construction to address water quality.

B. The purpose of these Design Standards is to provide designers with guidance and basic minimum design criteria to meet (BMP) requirements. This field is in its infancy and modifications will be necessary as new methods become available. Innovations and alternate means are strongly encouraged in order to meet the objectives at a reasonable cost. Beyond basic minimum design criteria of this Ordinance, designers, developers and contractors are encouraged to utilize the *Pennsylvania Handbook of Best Management Practices for Developing Areas* (dated Spring of 1998 as prepared by CH2M Hill) as a selection guide and design reference for developing BMPs as necessary for any regulated activity.

C. Application of BMPs. BMPs shall be required under the following conditions and/or activities:

1. Any new or proposed land development or subdivision where storm water management facilities are required as identified in Section 105.

2. Any expansion or alteration of an existing storm water management facility.

3. Any other development, land disturbance or construction activity where the Township determines that said activities might adversely affect storm water runoff.

D. The strategy employed avoids the use of performance standards related to effluent standards. Instead, it establishes a suggested long-term storage volume to be provided with any proposed land use. Other design methods are available and may be utilized provided

documentation is furnished and reviewed by the Township Engineer and approved by the Township Supervisors.

E. General Conditions:

The Township shall require a minimum long-term storage volume to be provided with a regulated activity as set forth below. If an applicant demonstrates to the satisfaction of the Township that a method other than the minimum long-term storage volume required by this Ordinance will provide the same level of improvement of water quality for surface runoff entering waterways, streams and creeks, the applicant may use such alternate design. The Township will consider non-storage measures such as the use of natural open space buffers only if an evaluation of such alternate design demonstrates that it will accomplish the water quality goals to at least the same as the minimum long-term storage volume. All applicants shall adhere to the following as part of the design for any BMP facility:

1. Minimize the amount of onsite impervious areas.

    a. Preserve existing natural wooded and vegetative cover while maintaining any natural drainage ways.

    b. Consider providing semi-impervious surfaces such as porous pavements and gravel, which can be considered an application of BMPs.

2. Maximize the amount of onsite drainage areas that are directed toward or drain to BMP facilities. The minimum area of the site, which shall be directed towards or drain to BMP facilities shall be seventy percent (70%). All impervious areas installed on the site will drain toward the BMP facilities.

3. Minimize directly connected impervious areas by providing vegetative strips, sand filters, gravel traps or other similar BMP facilities. Other means could be the use of bio-retention facilities to promote the natural removal of pollutants and groundwater recharge. Runoff from impervious areas should be directed to pervious areas such as lawns or grassed swales in order to promote the spreading (and not the concentration) of storm water prior to leaving the onsite area.
   For example:

    a. Roof downspouts to lawns

    b. Driveways to lawns

    c. Parking areas to lawns or grassed swales

4. Prevent mixing of off-site and on-site runoff, unless the upstream drainage area is less than five percent (5%) of the total on-site area.

5. Minimize the amount of site disturbance and grading in order to retain existing drainage patterns.

6. Delay the construction of BMPs, except temporary erosion and sedimentation controls, until all site construction and related land disturbance activities are complete in order to minimize the potential for clogging, maintenance or other remedial action.

7. Evaluate the underlying soils of the site and incorporate any conditions of such into the design of BMPs to ensure the maximum life of the facility.

8. Use water tolerant vegetation and grass (orchard, bermuda, perennial rye, fescue, reed canary grasses, etc.) in swales with slopes less than two percent (2%) or other areas where appropriate. In other areas, native plant materials should be utilized to reduce the degree of required maintenance.

9. Provide a length to width ratio in all detention/retention basins/ponds and other such storage facilities of at least 2:1 to maximize the flow paths between the inflow point and the outlet structure.

10. Provide proper erosion control at all storm sewer discharge points, pipe outlets or other concentrated flow locations where accelerated runoff velocities can be expected. Use natural materials for energy dissipation and erosion control.

11. Utilize under drains to dewater all basins intended to be "dry-bottom". Underdrains shall not considered part of the primary outlet (metering) structure.

12. Size BMP outlets to release water at a rate producing a 36-hour drawdown time - in addition to normal basin storage drawdown time. Orifices should be sized to accomplish this (minimum one inch (1") diameter holes). To prevent clogging around a vertical riser use a cone of gravel or welded wire protection around outlet orifice.

13. Infiltration trenches provided for storm water management do not require additional storage volume calculations for BMP. Subsurface detention facilities (non-perforated pipes, concrete box/vault) that ultimately outlet to the surface via a discharge pipe or similar outlet do not satisfy storage volume requirements for a BMP facility.

F. System of Controls:

1. The Heidelberg Township approach to protect water quality is to eliminate the impact of pollutants in storm water runoff through a system of controls. These controls can be at the source, in the lot, at the site, or at some regional facility. Examples are listed below.

2. Source Controls - eliminate the opportunity for pollutants to mix with storm water runoff.

   a. Street sweeping

   b. Cover chemical storage areas
   c. Dike potential spill areas

d. Regular sediment removal from drainage system

3. Lot Controls - prevent the potential for concentrating pollutants and concentrating storm water runoff.

a. Eliminate directly connected impervious areas

b. Minimize impervious areas

c. Utilize grass swales and filter strips

d. Utilize infiltration trenches, where applicable

e. Utilize porous pavement

4. Site Controls - structural methods required to meet storage volume requirements and water quality objectives.

a. Grass swales

b. Infiltration basins

c. Detention ponds

d. Wetlands

5. Regional Controls (Drainage Area greater than one hundred (100) Acres) - off-site structural measures for large projects.

a. Detention basins

b. Retention basins

G. Design Requirements. The means and methods of addressing BMPs as part of site development shall be based on actual performance depending on site conditions. Applicants shall design BMP facilities to attain the goals set forth in this Section 407. All storm water management facilities shall include the following minimum requirements to implement BMPs within the Township.

1. Required BMP Storage Volume Calculation. BMP storage volume shall be provided as per Sections 307 G.2. and 307 H.4. for Ground Water Recharge Volume and Water Quality Volume, respectively:

a. Measure the area of land disturbance activity on the site draining to the discharge point.

b. Compute the impervious area within the area of the land disturbance activity on the site draining to the discharge point.

c. Compute the percentage of impervious area for the land disturbance activity.

d. Determine the storage volume requirement, using the volume formulas in Sections 307 G.2. and 307 H.4. for Ground Water Recharge Volume and Water Quality Volume, respectively.

H. BMP Design Guidelines. The following are example facilities and design guidelines that may be utilized to address BMP requirements:

1. Infiltration Trench and Dry Well (or Seepage Trench and Seepage Pit). Infiltration trenches are below grade facilities constructed by excavating along, narrow trench backfilled with stone aggregate material to provide a storage volume within the voids while allowing infiltration into the surrounding soil. Dry wells function in much the same manner, except the inflow is typically conveyed to and distributed throughout the system with series of pipes. The following guidelines must be adhered to in the design of infiltration trenches:

a. Maximum drainage area = five (5) acres.

b. The bottom of the excavating trench must be a minimum of two (2) feet above the seasonal high water table or bedrock. Soil sampling, test pits or auger testing must be completed in the proposed location of the facility in support of the design.

c. Permeability data must be based on actual field tests at the lowest elevation of the system or published soil data for the site. The procedure for, or actual results of, determining the suitability for onsite sewage disposal facilities are acceptable.

d. The required storage volume must be able to infiltrate within a 72-hour period. The minimum rate of infiltration must be 0.5 inches per hour and the maximum rate 12.0 inches per hour.

e. If the infiltration trenches have been sized for storm water management purposes, no additional calculations are required. If the infiltration trench is provided for BMP purposes only, then follow the volume requirements for Ground Water Recharge and Water Quality in Section 307 G.2. and 307 H.4.

f. See Appendices 14 and 15 for sample details.

g. Sample calculation as follows:

Given: Percolation Rate = 2"/hr.

Required Storage Volume = 2,500 CF

Trench Volume with 40% Stone Voids
= 2,500 - ÷ 0.40 = 6,250 CF

Drawdown Time = Trench Depth + Perc. Rate
= 36" (assumed) — 2"/hr. = 18 hrs

2. Infiltration Basin. Infiltration basins are above grade depressions created by shallow excavation for the storage of storm water. The release of collected storm water runoff is by infiltration or percolation to the ground. The following guidelines must be adhered to in the design of infiltration basin:

a. Maximum drainage area = five (5) acres.

b. Minimum storage volume based on the section 307 G.2. and 307 H.4. for ground water recharge volume and water quality volume.

c. The bottom of the excavated trench must be a minimum of two (2) feet above the seasonal high water table or bedrock. Soil sampling, test pits or auger testing must be completed in the proposed location of the facility in support of the design.

d. Permeability data must be based on actual field tests at the lowest elevation of the system or published soil data for the site. The procedure for, or actual results of, determining the suitability for onsite sewage disposal facilities are acceptable.

e. Maximum Side Slopes = 3:1

f. See Appendix 16 for sample detail.

3. Extending Dry Detention Basin. Extended dry detention basins are modified storm water management detention basins that have over excavated bottom areas. The required BMP storage volume is provided below the elevation of the storm water management outlet structure. The following guidelines must be adhered to in the design of extended dry detention basins:

a. Minimum required BMP storage volume based on Section 307 G.2. and 307 H.4. for ground water recharge volume and Water Quality volume.

b. Maximum Side Slopes = 3:1

c. The required storage volume shall be provided and maintained above which the 2-year storm event volume must be provided and discharged within a 24-hour to 40-hour period. The minimum outlet structure hole or

orifice diameter = 1/2 inch. Drawdown or dewatering time calculations shall be based on accepted engineering practices, subject to the review and approval by the Township.

d. The bottom of the excavated basin must be a minimum of two (2) feet above the seasonal high water table or bedrock. Soil sampling, test pits or auger testing must be completed in the proposed location of the facility in support of the design.

e. Permeability data must be based on actual field tests at the lowest elevation of the system or published soil data for the site. The procedure for, or actual results of, determining the suitability for onsite sewage disposal facilities are acceptable.

f. Within the BMP storage area, suitable vegetation (ground cover or other plantings) shall be of a water tolerant species.

g. The minimum length to width ratio = 2:1.

h. See Appendix 17 for sample detail.

4. Wet/Retention Basin. A wet/retention basin is a storm water management facility, which include: (a) a permanent pool of water enhancing water quality and (b) additional storage volume above the pool for detaining storm water runoff. The required BMP storage volume is provided above the permanent pool elevation and released gradually.

a. Minimum required BMP storage volume based Section 307 G.2. and 307 H.4.

b. The minimum length to width ratio = 2:1.

c. Permeability data must be based on actual field tests at the lowest elevation of the system or published soil data for the site. The procedure for, or actual results of, determining the suitability for onsite sewage disposal facilities are acceptable.

d. The required storage volume must be able to infiltrate or discharge within a 24-hour to 40-hour period.

e. Drawdown or dewatering time calculations shall be based on accepted engineering practices, subject to the review and approval by the Township.

f. See Appendix 18 for sample detail.

5. Wetlands. Wetlands are created when an area is inundated or saturated by surface or groundwater at a regular frequency and duration sufficient to support a prevalence of vegetation and plants adapted for life in saturated soil conditions. Wetlands can include swamp, marches and bogs. Such areas can be very effective in the removal of pollutants from storm water runoff.

   a. For design criteria, reference the most recent publications available from the PADEP.

   b. Inflow or supply of surface/groundwater must be greater than the infiltration rate.

   c. Depth requirement will vary; however, the following are general guidelines:

      (1) Twenty-five percent (25%) of the area should be at two (2) to three (3) feet depth near the outlet.

      (2) Twenty-five percent (25%) of the area should be at six (6) to twelve (12) inches in depth.

      (3) Fifty percent (50%) of the area should be at six (6) inches deep near the inflow location.

6. Water Quality Inlet. A water quality inlet is a three-stage underground retention system designed for removing heavy particles and absorbed hydrocarbons from storm water runoff. These facilities should be used for small impervious areas (parking lots) where an exceptionally excessive amount of oily wastes are anticipated.

   a. Required Volume = two hundred (200) CF per impervious acre.

   b. These facilities must be retained in private ownership; specifically the Township will not accept dedication of these facilities.

   c. See Appendix 19 for sample detail.

7. Other BMPs Measures. The practice of providing BMPs is in its infancy and modifications will be necessary as new methods, techniques and materials become available. Consequently, the Township will encourage other means and methods to incorporate BMPs, subject to the review and approval of such.

I. Maintenance Considerations.

1. Maintenance is an essential aspect of any BMPs to ensure the successful and continued functioning of the system. Therefore, the extent of maintenance, the responsible individual or entity and the frequency of such shall be established.

2. At a minimum, the maintenance of BMP facilities during and after construction

shall be in accordance with Section 501 A. and Section 501 B. of this Ordinance.

3. The components of a maintenance program shall include, at a minimum, the following items:

   a. Routine Maintenance.

      (1) Inspection.

      (2) Vegetation control and periodic maintenance.

      (3) Debris and litter control.

      (4) Mechanical components maintenance.

   b. Non-routine Maintenance.

      (1) Embankment/dam settling and stabilization.

      (2) Erosion control and repair.

      (3) Sediment removal.

      (4) Outlet structure maintenance and replacement.

4. Access to BMP facilities should be addressed during the design stage. Depending on the type of facility, provisions for maintenance personnel, inspections and equipment must be provided. Storm water management easements should be provided/created and the configuration/location of such must be established during the design stage. If necessary, provisions for all-weather roads suitable for heavy equipment may be required.

5. The use of native plants shall be considered to reduce the potential degree of maintenance required.

J. Regulatory Compliance. All BMPs that are of the size and type or in a location that would require the approval of a State or Federal agency shall require securing the appropriate permits or approvals. This would include, but not be limited to, the following:

1. U.S. Army Corp of Engineers. Clean Water Act, §401 and §404: related construction within the floodplain or modifying stream channels.

2. PADEP and/or the Lebanon County Conservation District Storm water Management Act (Act No. 167); Chapter 92, National Pollution Discharge Elimination System; Chapter 93, Water Quality Standards; Chapter 102, Erosion Control; Chapter 105, Dam Safety and Waterway Management.

SECTION 307 CALCULATION METHODOLOGY

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

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

TABLE III-1
ACCEPTABLE COMPUTATION METHODOLOGIES FOR STORM WATER MANAGEMENT PLANS

METHOD	METHOD DEVELOPED BY	APPLICABILITY
TR-20 (or commercial computer package based on TR-20)	USDA NRCS	Applicable where use of full hydrology computer model is desirable or necessary.
TR-55 (or commercial computer package based on TR-55)	USDA NRCS	Applicable for land development plans within limitations described in TR-55.
HEC-1 / HEC-HMS	US Army Corps of Engineers	Applicable where use of full hydrologic computer model is desirable or necessary.
Rational Method (or commercial computer package based on Rational Method)	Emil Kuichling (1889)	For sites less than 200 acres, Tc<60 min. or as approved by the Township.
PSRM	Penn State University	Applicable where use of a hydrologic computer model is desirable or necessary; simpler than TR-20 or HEC-1.
Other Methods	Varies	Other methodologies approved by the Township.

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

Storm Event	Inches-of-Rainfall*
1 year	2.5
2 years	3.1
5 years	4.1
10 years	5.0
25 years	5.52
50 years	6.48
100 years	7.44

*highest values used within both watershed plan areas.

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

If the Rational Method is used, the Region 4, PENNDOT Storm Intensity – Duration - Frequency Chart (PDT-IDF), dated May 1986 shall be used to determine the rainfall intensity in inches per hour. (See chart in Appendix 5.)

C. Runoff calculations shall include a hydrologic and hydraulic analysis indicating volume and velocities of flow and the grades, sizes, and capacities of water carrying structures, sediment basins, retention and detention structures and sufficient design information to construct such facilities. Runoff calculations shall also indicate both pre-development and post-development rates for peak discharge of storm water runoff from the Development Site.

D. All pre-development calculations for the on-site area, unless in woodland, shall be based upon the assumption of grass or pasture cover in good hydrologic condition. Wooded areas shall utilize forest/woodland cover coefficients assuming under story/under brush and ground litter (decaying leaves, humus). Where the site contains existing impervious surface, up to fifty percent (50%) of the impervious area may be considered as an existing pre-development condition.

E. For the purpose of calculating pre-development peak discharges, all runoff coefficients and curve number for the adjacent off-site condition, shall be based on actual land use assuming summer or good land conditions. Runoff coefficients for off-site discharges used to design conveyance facilities through the site being developed (on-site area) shall be based on actual land use assuming winter or poor land conditions.

F. Criteria and assumptions to be used in the determination of storm water runoff and design of management facilities are as follows:

1. Runoff coefficients and curve numbers shall be based on the information contained in Appendices 6 and 7 if the actual land use is listed in those Appendices. If the actual land use is not listed in these Appendices, runoff coefficients and curve numbers shall be chosen from other published

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

For the proposed post-development condition, runoff coefficients and curve numbers shall be based on the actual proposed conditions. The Weighted Residential values shown on both Appendices 6 and 7 are only to be used for determining adjacent off-site conditions for existing developed areas.

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

a. Sheet flow: The maximum length for each reach of sheet or overland flow before shallow concentrated or open channel flow develops is one hundred fifty (150) feet. Flow lengths greater than one hundred (100) feet shall be justifiable based on the actual conditions at each site. Sheet flow may be determined using the nomograph in Appendix 8, or the Manning's kinematic solution shown in the Sheet Flow section of Worksheet No. 1 in Appendix 9.

b. Shallow concentrated flow: Travel time for shallow concentrated flow shall be determined using Figure 3-1 from TR-55, Urban Hydrology for small watersheds, as shown in Appendix 10.

A sample worksheet for calculating times of concentration is provided in Appendix 9.

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

G. Ground Water Recharge

1. General Requirements

Design for storm water management during subdivision and land development shall include measures to retain and infiltrate rainfall on-site to replenish the ground water. Recharge of the ground water will insure that base stream flow levels are maintained, well water supplies remain available and dependent plants have adequate access to water resources.

Storm water management design shall provide for ground water recharge to compensate for the reduction in percolation that occurs when the ground surface is covered buildings, paving and other impervious surfaces. Developed areas shall maintain ground water recharge consistent with pre-development conditions.

A geological evaluation of the site is required to determine the suitability for ground water recharge facilities. Factors such as carbonate geology, high water table, impermeable soils and bedrock may affect or prevent the design of recharge facilities. Liners and other appropriate design features may be required to avoid sinkholes and ground water contamination. Where it is demonstrated by the developer that ground water recharge design is not feasible for a site, upon agreement with the Township Engineer the site may be exempted from recharge requirements.

2. Ground Water Recharge Volume

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

$$Re_v = [(S)\ (R_v)(A)] / 12$$

Re_v = Recharge volume in acre-feet
A = Area of watershed in acres
R_v = 0.05 + 0.9(I) where I = net increase in impervious area /Area of watershed (A)

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

Hydrologic Soil Group	Soil Specific Recharge Factor (S)
A	0.38
B	0.25
C	0.13
D	0.06

1. If more than one hydrologic soil group (HSG) is present at a site, a composite recharge volume shall be computed based upon the proportion of total site area within each HSG.

2. Infiltration BMPs intended to receive runoff from developed areas shall be selected based on suitability of soils and site conditions and shall be constructed on soils that have the following characteristics:

   a. A minimum depth of forty-eight (48) inches between the bottom of the facility and the seasonal high water table and/or bedrock (limiting zones)

   b. An infiltration and/or percolation rate sufficient to accept the additional storm water load and drain completely as determined by field tests conducted by the Developer's Engineer or Geologist.

3. Infiltration BMPs receiving only roof runoff may be placed in soils having a minimum depth of twenty-four (24) inches between the bottom of the facility and the limiting zone.

4. The recharge volume provided at the site shall be directed to the most permeable HSG available.

5. Structural Storm water management facilities which provide treatment and recharge of the required Recharge Volume will be designed as part of a storm water management facility which incorporates groundwater recharge BMPs as a primary benefit of using that facility, in accordance with design specifications contained in "Pennsylvania Handbook of Best management Practices for Developing Areas", 1998.

6. The Groundwater Recharge volume shall be infiltrated within forty-eight (48) hours after the end of the design storm.

7. Watersheds where the post developed impervious area is equal to or less than the pre developed impervious area shall not be required to provide Ground Water Recharge volume.

H. Water Quality and Best Management Practices

1. General Requirements

Storm water management design shall address water quality needs, in addition to water quality control, to minimize the adverse effects of development. An important component of a storm water management site plan is the Best Management Practices (BMP) design which must insure that water quality degradation does not occur as a result of any subdivision, land development or any other regulated activity.

2. Goals and Objectives

a. Preserve existing natural features, especially those which store, infiltrate or filter water runoff.

b. Infiltrate rainfall to recharge the ground water table.

c. Use physical (structural) and biological or vegetative (non-structural) filtration of water runoff to reduce pollutants and remove sediment.

d. Moderate water runoff velocities to minimize erosion and damage to downstream aquatic habitat.

e. Integrate BMPs into the site layout to perform a water quality function and compliment the developed use of the site.

f. Enhance site aesthetics through the use of a variety of BMP techniques and components.

g. Maximize collection and treatment of small storm event (first flush) storm water runoff which contains the highest concentration of pollutants.

h. Utilize a system of BMP facilities and ground water recharge devices throughout the site.

3. General Standards

a. Water quality shall be maintained through the requirements of BMP design components for all subdivisions, land developments and regulated activities, except where other provisions of this Ordinance provide for plan or storm water design exemptions. Also exempted are minor subdivisions such as lot additions, lot revisions, division of existing buildings and other plans where no new construction or development is proposed. Revision or expansion projects requiring land development approval with storm water design shall include measures to retrofit the site with BMPs to maintain or improve water quality of the storm water discharges.

b. The required water quality volume, specified elsewhere herein, shall be detained and treated within BMPs for each site to be developed.

c. Site designs shall minimize earth disturbance and the generation of storm water runoff while maximizing pervious areas for treatment of storm water.

d. All BMPs shall be sized to capture the required water quality volume, designed according to the BMP criteria within this Ordinance, constructed properly and maintained regularly by the property owner.

e. Storm water runoff which is directly discharged to wetlands, streams, ponds, High Quality or Exceptional Value Watersheds or which originates from land uses or activities with higher potential for pollutant loadings (such as auto salvage yards, vehicle service areas, loading/unloading areas, truck centers, etc.) may require the use of additional or specific structural BMPs for pollution prevention and maintenance of water temperatures and quality.

f. Place BMPs near the source of storm and treat runoff from impervious surfaces before mixing with runoff from less contaminated sources.

g. Use native vegetation and water tolerant plants. Trees and shrubs shall not be planted on storm water facility embankments or in other areas where roots may endanger pipes, headwalls, endwalls, spillway structures or other structural facilities.

h. All impervious area runoff shall be directed toward BMPs.

4. Water Quality Volume

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

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

WQ_v = Water Quality volume in acre-feet
A = Area of watershed in acres
R_v = 0.05 + 0.9(I) where I = net increase in impervious area / Area of watershed (A)

WQ_v shall be designed as part of a storm water management facility which incorporates water quality BMPs as a primary benefit of using that facility, in accordance with design specifications contained in "Pennsylvania Handbook of Best Management Practices for Developing Areas", 1998. The Water Quality facilities shall be capable of collecting, treating and draining/dewatering the Water Quality volume in no less than 24 hours or more than 48 hours after the end of the design storm, unless the BMP facility is specifically designed for long term water storage.

The volume of water runoff that is infiltrated into the ground water recharge facilities may be subtracted from the volume of water runoff that must be captured and treated within the water quality (BMP facilities.

Watersheds where the post developed impervious area is equal to or less than the pre developed impervious area shall not be required to provide Water Quality volume, unless required by NPDES Part II.

I. Riparian Buffer Easement

1. In order to protect the existing environmentally sensitive areas within the Township, protect the natural resources and aid in the improvement of water quality, riparian buffer easements shall be created as part of any subdivision or land development.

2. For any site located immediately adjacent to or encompassing a watercourse (e.g., stream, creek or other natural body of water), a riparian buffer easement measuring thirty-five (35) feet in width from the centerline (on each side) of the

watercourse shall be provided and maintained (for the purpose of the Section only drainage swales shall not be considered watercourses). The purpose of the riparian buffer easement shall be to protect and preserve the existing natural features and environmental resources subject to the following requirements:

a. Preservation of Existing Buffer Plantings. Within the riparian buffer easement the existing natural tree and vegetation shall be preserved.

b. Required Buffer Plantings. To create a riparian forested buffer, the required easement area shall be planted with additional native trees, shrubs and other plant material as determined necessary (depending on site conditions) in order to create a suitable riparian canopy and understory. For the purpose of determining the suitability of the riparian canopy and understory, new planting requirements shall be based on published practices and guidelines subject to the review, approval and satisfaction of the Township.

c. The riparian buffer easement shall be incorporated into the deed for the property or lot(s) and shall limit the use of the property location therein. The easement shall allow for the continued private ownership and shall count toward the minimum lot area as required by the Heidelberg Township Zoning Ordinance, but the easement shall restrict the land uses to the current use or to other non-damaging activities.

d. The outlet of any storm sewer piping system or storm water management facility shall not be permitted within riparian buffer easement. This will create a setback or separation distance from the receiving watercourse. In this way, a natural filter strip will be created so that the quality storm water runoff will be improved before reaching the watercourse.

e. Any activities within the riparian buffer easement shall be completed in a manner that will preserve and protect the existing limits of the 100-year floodplain and floodway.

SECTION 308 USE OF PERFORMANCE STANDARDS AND CRITERIA

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

A. Compute:

1. Pre-development hydrograph at the site discharge point for the required design storm.

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

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

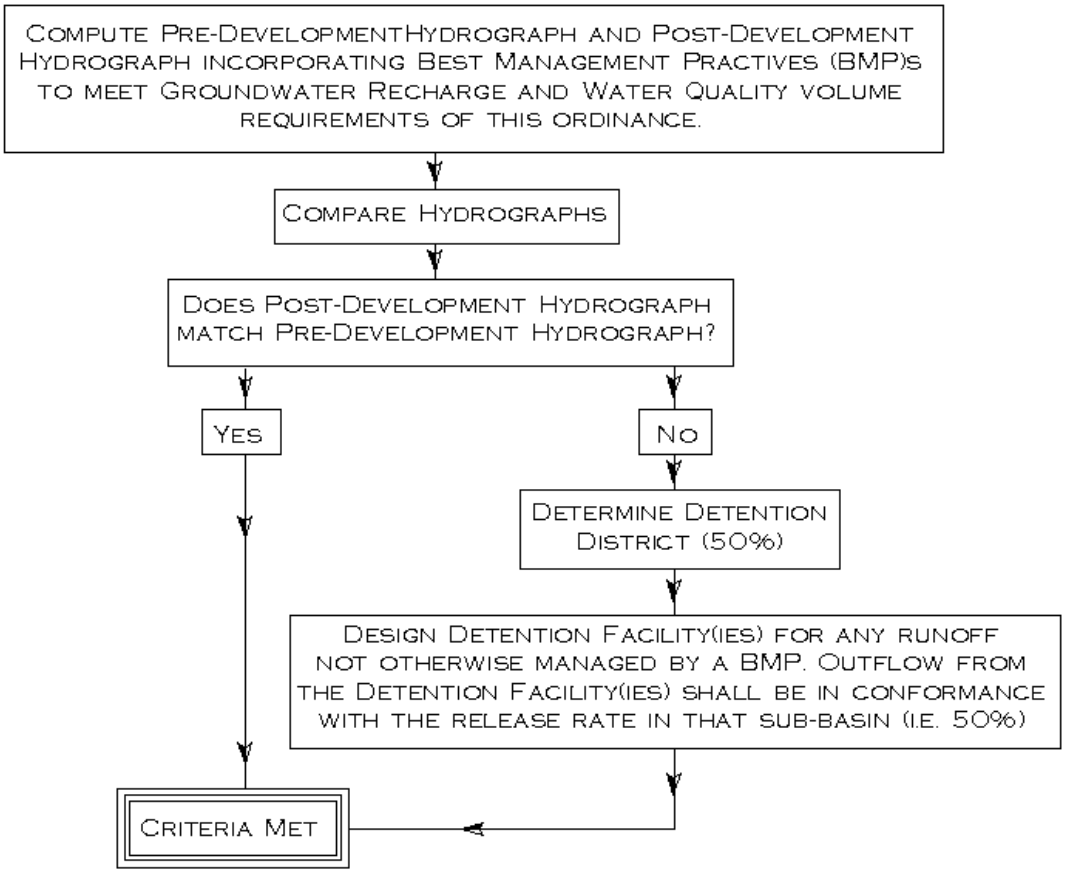
B. Compare:

Post-development hydrographs with pre-development hydrographs. If the peak rate of runoff and the shape of the hydrographs are nearly identical to the same significant figure, storm water management has been achieved. Detention will not be required. If not, proceed to Item C.

C. Design:

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

Figure III-1
STORM WATER CONTROL DETERMINATION FLOW CHART
(Cocalico Creek Act 167 Watershed Plan only)



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9 FLOODPLAIN

Floodplain areas shall be established and preserved as provided below:

A. A one hundred (100) year floodplain shall be established for all watercourses and shall be delineated by one of the following methods.

1. A hydrologic report prepared by an individual registered in the Commonwealth of Pennsylvania to perform such duties.

2. An existing hydrologic report prepared by an agency of the County, State, or U.S. Government (FEMA) that includes detailed study data. Floodplain established by approximate methods are not acceptable and will necessitate compliance with Subsection A.1. above.

B. Whenever a floodplain is located within or along a lot, the Record Plan (where a regulated activity constitutes a subdivision or land development) or Storm Water Management Site plan (where a regulated activity does not constitute a subdivision or land development) shall include: the boundary of the floodplain, along with the elevation and locational dimensions from the centerline of the watercourse; a plan note that the floodplain shall be kept free of structures, fill, and other encroachments; and a plan note that floor elevations for all structures adjacent to the floodplain shall be two (2) feet above the FEMA and/or calculated 100-year flood elevation.

C. This Section 309 shall not be construed as a prohibition on uses permitted within the Floodplain Zone by the Zoning Ordinance.

D. All plans that include floodplain areas must be based on survey benchmarks that correlate to USGS Datum used in any referenced flood study in Subsection A.2. above.

ARTICLE IV
PLAN REQUIREMENTS

SECTION 401 GENERAL REQUIREMENTS

In accordance with Section 105 of this Ordinance, a land disturbance activity, as defined in Section 201 of this Ordinance, shall not be initiated until a Storm Water Management Permit has been issued.

SECTION 402 EXEMPTIONS

The following activities are specifically exempt from the plan requirements of this Ordinance:

A. Any Regulated Activity that meets the exemption criteria in Ordinance Appendix 26 may be exempt from the provisions of this Ordinance. These criteria shall apply to the total development even if the development is to take place in phases. The effective date of this Ordinance shall be the starting point from which to consider tracts as "parent tracts" in which future subdivisions and respective impervious area computations shall be cumulatively considered. Exemption shall not relieve the applicant from implementing such measures as are necessary to protect health, safety, and property. This exemption shall not relieve the applicant from meeting the requirements for water quality, groundwater recharge, channel protection, or special requirements for high quality (HQ) and exceptional value (EV) watershed.

B. Land disturbance associated with existing one and two family dwellings, subject to conditions described in Appendix 26 of this Ordinance.

C. Agricultural Activities when operated in accordance with a conservation plan or erosion and sedimentation control plan found adequate by the Lebanon County Conservation District. The agricultural activities such as growing crops, rotating crops, tilling of soil and grazing animals and other such activities are specifically exempt from complying with the requirements of this Ordinance.

D. Forest Management operations which are following the PADEP management practices contained in its publication "Soil Erosion and Sedimentation Control Guidelines for Forestry" and are operating under an erosion and sedimentation control plan.

E. Use of land for gardening and landscaping of the property, up to maximum disturbance of less than two thousand (2,000) square feet, when performed as an accessory use to the primary use of the property.

SECTION 403 STORM WATER MANAGEMENT SITE PLAN CONTENTS

A. All activities regulated by Section 105 of this Ordinance and/or governed by the Act 167 Plans shall prepare a storm water management site plan. The Storm Water Management Site Plan shall consist of all applicable calculations, maps and plans. A note on the maps shall refer to the associated computations and erosion and sedimentation control plan by title and date. The cover sheet of the computations and erosion and sedimentation control plan shall refer to the associated maps by title and date. All Storm Water Management Site Plan materials shall be submitted to the Township in a format that is clear, concise, legible, neat and well organized. Incomplete submissions shall be returned to the Applicant within 7 days, along with a statement that the submission is incomplete, and stating the deficiencies found. Otherwise, the application shall be deemed accepted for filing as of the date of submission. Acceptance shall not, however, constitute a waiver of any deficiencies or irregularities. The applicant may appeal the Township's decision not to accept a particular application in accordance with Section 703 of this Ordinance.

SECTION 404 PLAN CONTENTS - MAJOR LAND DISTURBANCE ACTIVITIES

A. <u>The Following General Information:</u>

1. Proposed name or identifying title of the project.

2. Name and address of the landowner and developer of the project site.

3. The name of the individual or firm preparing the Plan.

4. Total acreage of the project site and the tract of land on which the project site is located.

5. Plan date, date of latest revision, north point, graphic scale, and written scale. All plans shall be drawn at a common engineering scale.

6. Plans shall be legible in every detail.

   Drawings or map(s) of the project area shall be drawn at 1" = 50' or larger scale and shall be submitted on 24-inch x 36-inch sheets and shall be prepared in a form that meets the requirements for recording for the Office of the Recorder of Deeds of Lebanon County. These drawings shall be in conformance with the applicable Subdivision and Land Development regulations.

7. A location map, for the purpose of locating the project site to be developed, at a minimum scale of two thousand (2,000) feet to the inch, showing the relation of the tract to adjoining property and to all streets and Township boundaries existing within one thousand (1,000) feet of any part of the tract of land on which the project site is proposed to be developed.

8. A North Arrow.

9. A Graphic and written scale of one-inch equals no more than fifty (50) feet.

10. The total Development Site boundary and size with distances marked to the nearest foot and bearings to the nearest degree.

11. Existing and proposed land use.

12. A key map showing all existing man-made features two hundred (200) feet beyond the Development Site boundary that could be affected by the project.

13. A note on the plan indicating any area that is not to be offered for dedication along with a statement that the Township is not responsible for maintenance of any area not dedicated to and accepted for public use, and that no alteration to swales, or basins, or placement of structures shall be permitted within easements.

14. Certificate, signed and sealed by a Registered Professional registered in the Commonwealth of Pennsylvania and qualified to perform such duties, indicating compliance with the provisions of this Ordinance. See form of certificate in Appendix 25.

15. The following certificates when the application is not in conjunction with the submittal of a Subdivision and/or Land Development Plan:

    a. Certificate for approval by the Township Board of Supervisors. See form of certificate in Appendix 22.

    b. Certificate for review by the Township Planning Commission. See form of certificate in Appendix 23.

    c. Certificate for review by the Township Engineer, if required by the Board of Supervisors. See form of certificate in Appendix 24.

16. Storm water management facility designs shall be prepared in accordance with the requirements of Tulpehocken Creek Act 167 Watershed Storm Water Management Plan or the Cocalico Creek Act 167 Watershed Storm Water Management Plan, whichever is relevant to the proposed site.

17. In areas of carbonate geology, a geologic evaluation prepared by a Registered Geologist shall be provided. This report shall contain remedies to address the formation of sinkholes and closed depressions in the land disturbance area.

B. <u>The Following Existing Features</u>:

1. Tract boundaries showing distances, bearings, and curve data, as located by field survey or by deed plotting.
2. Existing topographical data. This information shall be provided by field survey of contour lines.

Contour lines shall be provided at one (1) or two (2) foot vertical intervals for slopes of twenty (20) percent or less, and at vertical intervals of five (5) feet for more steeply sloping land. Additionally, the benchmark and the datum used shall also be indicated.

Aerial topography shall not be used for areas within the proposed limits of disturbance, except for aiding in determining drainage areas.

3. The names of all owners of all immediately adjacent land, the names of all proposed or existing developments immediately adjacent, and the locations and dimensions of any streets or easements shown thereon.

4. The names, locations, and dimensions of all existing streets, railroads, watercourses, drainage facilities, flood plains, wetlands, and other significant features within five hundred (500) feet of any part of the tract proposed to be developed and the location of all buildings and approximate location of all tree masses within the tract.

5. Soil types as designated by the USDA SCS Soil Survey of Lebanon County.

6. Designation of limits of on-site watershed areas, including a map that shows the off-site watershed areas.

7. Boundaries of watersheds as identified in the relevant Act 167 Watershed Storm Water Management Plans.

8. The locations of all existing utilities, sanitary sewers, and water lines within fifty (50) feet of property lines.

C. The Following Proposed Features:

1. The proposed land use, the number of lots and dwelling units and the extent of commercial, industrial, or other nonresidential uses.

2. The locations and dimensions of all proposed streets, parks, playgrounds, and other public areas; sewer and water facilities; lot lines and building locations, and parking compounds and other impervious and semi-pervious surfaces.

3. The proposed changes to land surface and vegetative cover including areas to be cut or filled.

4. Proposed topographical data. This information shall be provided by contour lines. Proposed contour lines shall be provided at two (2) foot vertical intervals for slopes of four (4) percent or less, and at vertical intervals of five (5) feet for more steeply sloping land.

5. Plans and profiles of all proposed storm water management facilities including vertical and horizontal alignment, size, and type of material. This information shall be of the quality required for the construction of all facilities.

6. For all basins, which hold two (2) acre-feet or more of water and have an embankment that is six (6) feet or more in height, soil structure and characteristics shall be provided. Plans and data shall be prepared by a registered professional engineer. These submissions shall provide design solutions for frost-heave potential, shrink-swell potential, soil bearing strength, water infiltration, soil settling characteristics, fill and back-filling procedures, and soil treatment techniques as required to protect the improvements for adjacent structures.

7. The type, location, and extent of all temporary and permanent erosion and sedimentation control measures shall be shown on an erosion and sedimentation control plan that conforms to the requirements of the Soil Erosion and Sedimentation Control Manual of the PADEP and which shall be submitted to the Lebanon County Conservation District for review.

8. Data concerning subsoil and rock foundation conditions and the physical properties of the materials entering into the construction of all BMPs.

9. The locations of all proposed utilities, sanitary sewers, and water lines within fifty (50) feet of property lines.

10. For storm water management facilities that would be located off-site, a note on the Plan referencing a recorded Storm Water Maintenance Agreement which indicates the location and responsibility for maintenance of the offsite facilities. All off-site facilities shall meet the performance standards and design criteria specified in this Ordinance. (See Section 501 for maintenance of on-site facilities.)

11. A statement, signed by the landowner, acknowledging the storm water management system to be a permanent fixture that can be altered or removed only after approval of a revised Plan by the Township.

12. The location of all erosion and sedimentation control facilities.

13. Plans for groundwater recharge facilities must show the locations of existing and proposed septic tank infiltration areas and wells. A minimum fifty (50) foot separation from On Lot Disposal System (OLDS) infiltration areas is required. Infiltration rates shall be based upon perk and probe tests conducted at the site of the proposed facility.

D. Written hydrologic and hydraulic report and erosion and sedimentation narrative including or prepared in accordance with the following:

1. Storm water runoff calculations for both pre-development and post-development conditions for peak discharge and pollutant removal.

2. An erosion and sedimentation control plan narrative that conforms to the requirements of the Soil Erosion and Sedimentation Control Manual of the PADEP and provides a description of all erosion and sedimentation control measures, temporary as well as permanent, including the staging of earth-moving activities, sufficient in detail to clearly indicate their function.

3. Description of an ownership and maintenance program, in a recordable form, that clearly sets forth the ownership and maintenance responsibilities for all temporary and permanent storm water management facilities, including the following:

   a. Description of the method and extent of the maintenance requirements.

   b. When maintained by a private entity, identification of an individual, corporation, association, or other entity responsible for ownership and maintenance.

   c. When maintained by a private entity, a copy of the legally binding document which provides that the Township shall have the right to:

      (1) Inspect the facilities at any time.

      (2) Require the private entity to take corrective measures and assign the private entity reasonable time periods for any necessary action.

      (3) Authorize maintenance to be done and lien the cost of the work against the properties of the private entity responsible for maintenance.

   d. Establishment of suitable easements for access to storm water management facilities.

      This document shall be recorded by the Township in the Lebanon County Recorder of Deeds Office at the applicant's expense prior to issuance of a permit.

4. For all proposed detention basins and retention basins, and temporary sedimentation basins, the documentation shall include a plotting or tabulations of storage volumes with corresponding water surface elevations and the outflow rates for those water surfaces.

5. For all proposed detention basins and retention basins, and temporary sediment basins, documentation shall set forth the design hydrology, and the short-cut routing method or a method of equal caliber acceptable to the Township Engineer and Township Planning Commission or Township Board of Supervisors utilized to determine the function of the basin.

6. All calculations, assumptions and criteria used in the design of the storm water management facilities must be shown. If multiple facilities are used in conjunction with each other, such as infiltration best management practices with vegetation based management practices, a summary narrative shall be included describing any sequencing and how the facilities are meant to function with each other to manage storm water runoff.

E. A Pennsylvania Department of Transportation Highway Occupancy Permit/Declaration of Adequacy for any storm water management facility proposed within the right-of-way of a state road.

F. Receipt of appropriate State and Federal permits for all activities in or along any bodies of water, waters of the U.S., or wetlands.

G. Receipt of approvals or permits from the appropriate agency for the Erosion and Sedimentation Control Plan.

SECTION 405 PLAN CONTENTS - MINOR LAND DISTURBANCE ACTIVITIES

A. The Minor Land Disturbance Plan shall include a general plan of:

1. lot configuration

2. existing and proposed building location

3. grading, where an area in excess of one thousand (1,000) square feet is proposed

4. storm water management facilities

5. erosion and sedimentation control facilities.

Refer to Appendix 21 and Appendix 21a of this Ordinance for a Blank Minor Land Disturbance Plan Form and a Minor Land Disturbance Plan example, respectively. This plan is intended to demonstrate the level of effort required to be included on a Minor Land Disturbance Plan application.

Although the plan need not demonstrate literal compliance with all provisions of plan requirements within Section 404 and the Design Standards of Article III, the plan must demonstrate that the proposed activity will comply with this Ordinance as outlined within Section 105.
The Township may require additional information or invoke any or every section of this Ordinance deemed necessary to demonstrate compliance with the intent of this Ordinance. The requirements of the Townships Enforcement Officer may be appealed to the Township Supervisors in accordance with Section 703 of this Ordinance.

SECTION 406 APPLICATION AND PLAN PROCESSING PROCEDURE

A. An application for a Storm Water Management Permit may be submitted to the Township on any business day. In the event that a question arises as to whether a proposed activity requires a Storm Water Management Permit, the landowner or developer shall furnish the Township with such information as the Township Engineer may deem necessary to determine whether the proposed activity constitutes a land disturbance activity. A decision by the authorized Township representative may be appealed to the Board of Supervisors in accordance with Section 703 herein.

B. If an application for a storm water management permit is submitted in conjunction with an application for subdivision and/or land development approval submitted to the Township in accordance with the requirements of the Heidelberg Township Subdivision and Land Development Ordinance, the landowner shall submit the required number of copies and follow all other procedural requirements as set forth in the Subdivision and Land Development Ordinance. The application for a storm water management permit shall be considered a part of the application for subdivision and/or land development approval, and the Township shall act upon that application at the time it acts upon the application for subdivision and/or land development approval.

C. Applications for a storm water management permit which are not submitted to the Township in conjunction with an application for subdivision and/or land development approval shall adhere to the procedures in this Section 406.

D. Major Land Disturbance Plans

1. The Township staff may review the application with the Township Engineer, Township Solicitor, the Lebanon County Conservation District, and other municipal officials in order to make recommendations to the Board of Supervisors whether to approve, conditionally approve, or disapprove the application.

2. The Township Board of Supervisors shall, within ninety (90) days from the receipt of a complete application, issue a permit or disapprove the application and transmit the decision in writing to the applicant.

3. A notice of disapproval shall cite the reasons for disapproval.

E. Minor Land Disturbance Plans

1. The Township staff may review the application with the Township Engineer, and other municipal officials in order to make recommendations to the Township Enforcement Officer whether to accept or not accept the application.

2. The Township Enforcement Officer shall, within ninety (90) days from the receipt of an accepted complete application, issue a permit or disapprove the application and transmit the decision in writing to the applicant. Failure of the Township Enforcement Officer to render a decision and communicate it as prescribed above shall be deemed an approval unless the time period is extended by written request by the applicant.

3. A notice of disapproval shall cite the reasons for disapproval.

4. The requirements of the Township Enforcement Officer may be appealed to the Township Supervisors in accordance with Section 703 of this Ordinance.

F. Township approval of an application for a storm water management permit whether for a Minor Land Disturbance or Major Land Disturbance or in conjunction with an application for subdivision and/or land development approval shall not be considered as an indication that the application complies with the standards of any agency of the Commonwealth or meets the requirements of any other Township ordinance or regulation. The Township may approve a storm water management permit subject to the condition that the landowner obtain other required permits and approvals, in which case the landowner shall not be entitled to commence development authorized by such conditional storm water management permit until presenting the Township with evidence that the landowner has obtained such other required permits or approvals.

G. For any activities that require a PADEP Joint Permit Application and regulated under Chapter 105 or Chapter 106 of PADEP's Rules and Regulations, require a Highway Occupancy Permit, or require any other permit under applicable state or federal regulations, the permit(s) shall be part of the Storm Water Management Site Plan.

SECTION 407 APPLICATION REQUIREMENTS

A. Major Land Disturbance Activity: An application for a Storm Water Management Permit for a major land disturbance activity, as defined in Section 201 of this Ordinance, shall include the following items:

1. One (1) completed copy of the Application for a Storm Water Management Permit, Major Land Disturbance Activity (See Appendix 2).

2. Eight (8) copies of the Land Disturbance Plan prepared in accordance with Section 404 of this Ordinance.

3. Permit fee as established by resolution or Ordinance from time to time.

B. Minor Land Disturbance Activity: An application for a Storm Water Management Permit for a minor land disturbance activity, as defined in Section 201 of this Ordinance, shall include the following items:

1. One (1) completed copy of the Application for a Storm Water Management Permit, Minor Land Disturbance Activity (See Appendix 1).

2. Three (3) copies of the Land Disturbance Plan prepared in accordance with Section 405 of this Ordinance.

3. Permit fee as established by resolution or Ordinance from time to time.

SECTION 408 WAIVER PROCEDURE

The provisions of this Ordinance are intended as minimum standards for the protection of the public health, safety, and welfare. The Board of Supervisors may grant a waiver from literal compliance with mandatory provisions of the Ordinance if the applicant can demonstrate either (1) that compliance would cause undue hardship as it applies to a particular property, or (2) that an alternative proposal will allow for equal or better results.

The approval of the waiver shall not have the effect of making null and void the intent and purpose of the Ordinance. In the approval of a waiver, the Board of Supervisors may impose such conditions, as will, in its judgment, secure substantially the objectives of the standards and requirements of the Ordinance.

A. Application Procedures (Waiver): All requests for waivers shall be processed in accordance with the following:

1. A request for a waiver shall be submitted to the Township with the required fee for an appeal or waiver. The request shall be made in writing and identify (1) the specific section of the Ordinance or decision which is requested for waiver, (2) the proposed alternative to the requirement, when applicable, and (3) justifications for an approval of the waiver.

2. The Township Secretary shall (1) schedule the request for consideration by the Board of Supervisors at a public meeting within forty-five (45) days of receipt, and (2) provide adequate notice to the applicant and any other involved parties of the meeting at which consideration of the request is scheduled.

3. The Board of Supervisors shall, following the consideration of the request, take such public action as it shall deem advisable and notify all parties involved of the action. Such notice shall cite the findings and reasons for the deposition of the waiver.

SECTION 409 EXPIRATION OF A STORM WATER MANAGEMENT PERMIT

All Storm Water Management Permits shall expire twelve (12) months from the date of issuance unless an application for extension of time has been filed prior to the expiration date. An extension of an unexpired Storm Water Management Permit shall be issued by the Board of Supervisors following the submission of a written request from the applicant if, in the opinion of the Board of Supervisors, the subject property or affected surrounding area has not been altered in a manner which requires alteration to the Land Disturbance Plan.

The refusal of an extension of time shall cite the reasons for such refusal. The applicant may re-file the request for extension of a Storm Water Management Permit after the reasons for refusal are addressed.

A Storm Water Management Permit shall not expire while a request for an extension is pending.

SECTION 410 FINANCIAL SECURITY

A. The Township shall, prior to issuing a Storm Water Management or Earth Disturbance Permit, require financial security to be posted for the storm water detention and/or retention basin and other drainage facilities, which may adversely affect adjacent properties, streets, or other public improvements in accordance with provisions outlined by Section 410 B. of this Ordinance.

B. Where required, the developer shall file with the Board of Supervisors financial security in an amount sufficient to cover the costs and installation of the storm water management facilities, including any inspection fees reasonably expected to be incurred by the Township.

Federal or Commonwealth chartered lending institution irrevocable letters of credit and escrow accounts shall be deemed acceptable financial security. Letters of credit shall be posted with a Federal or Commonwealth chartered lending institution chosen by the developer, provided said lending institution is authorized to conduct such business within the Commonwealth. Escrow accounts shall be established in such financial institutions as may be designated by the Board of Supervisors. If the developer establishes financial security in the form of an Irrevocable Letter of Credit, the Letter of Credit shall provide that the Letter of Credit shall automatically renew each year unless and until all improvements are completed and accepted by the township, and that in no event shall the Letter of Credit automatically lapse without the written consent of the township, or without written notice to the township by registered mail at least sixty (60) days prior to such lapse or nonrenewal and with the opportunity for the township to draw against the Letter of Credit prior to expiration.

Such security shall provide for, and secure to the public, completion of the storm water management facilities within one (1) year of the date fixed on the permit for such facilities. The amount of financial security shall be equal to one hundred ten (110) percent of the cost of the required facilities for which financial security is to be posted.

The amount of financial security required shall be based upon an estimate of the cost of completion of the required improvements, submitted by an applicant or developer and prepared by a professional engineer licensed as such in this Commonwealth and certified by such engineer to be a fair and reasonable estimate of such cost. The Board of Supervisors, upon the recommendation of the Township Engineer, may refuse to accept such estimate for good cause shown. If the applicant or developer and the Township Engineer are unable to agree upon an estimate, then the estimate shall be recalculated and re-certified by another professional engineer licensed as such in this Commonwealth and chosen mutually by the Board of Supervisors and applicant or developer. The estimate certified by the third engineer shall be presumed fair and reasonable and shall be the final estimate. In the event that a third engineer is so chosen, fees for the services of said engineer shall be paid equally by the Township and the applicant or developer.

SECTION 411 RECORD DRAWINGS

At the completion of the project, and as a prerequisite for the release of the Financial Security, the developer or his representative shall provide a certificate of completion from a registered engineer, architect, surveyor, or other qualified person verifying that all permanent facilities have been constructed according to the plans and specifications and approved revisions thereto. Certification shall be provided on a set of record drawings.

A. After receipt of the record drawing certification of completion, a final inspection shall be conducted by the Township Engineer or other person designated by the Township to certify compliance with this Ordinance.

ARTICLE V
MAINTENANCE

SECTION 501 MAINTENANCE OF STORM WATER MANAGEMENT FACILITIES AND BMP FACILITIES

Maintenance is an essential part of the successful functioning of a storm water management system.

A. Maintenance during development of a project shall be the responsibility of the developer and/or landowner and shall usually include but not be limited to:

1. Removal of silt from sediment traps when the volume is reduced from two thousand (2,000) cubic feet per tributary acre to one thousand three hundred (1,300) cubic feet per tributary acre (35%) as per the PADEP March 2000 Erosion and Sedimentation Pollution Control Manual, as amended; and sediment basins when volume is reduced from seven thousand (7,000) cubic feet per tributary acre to five thousand (5,000) cubic feet per tributary acre (28%) as per the PADEP March 2000 Erosion and Sedimentation Pollution Control Manual, as amended;

2. Periodic maintenance (after each storm event) of temporary control facilities such as replacement of straw bale dikes, straw filters, silt fence, or similar measures;

3. Establishment or reestablishment of vegetation by seeding and mulching or sodding of scoured areas or areas where vegetation has not successfully been established;

4. Installation of necessary controls to correct unforeseen problems caused by storm events within design frequencies; and

5. The applicant shall be responsible for removal of all temporary measures and installation of permanent measures upon completion of the project.

B. Maintenance of project after physical completion:

1. It is the purpose of this Ordinance that the Township shall not become responsible for maintenance and supervision of developed areas. Such responsibility falls upon the party responsible for land development, who shall remain personally responsible for those areas of the development, which are subject to the requirements of this Ordinance. This responsibility may be retained or assigned to third persons as is deemed most acceptable to the party responsible for land development. In the event that any portion of land development would, but for the existence of areas requiring maintenance subject to this Ordinance, be dedicated to the Township, the applicant may apply to the Board of Supervisors for acceptance by the Township of such portions of the land development. In the event that the Board of Supervisors, by formal action, accepts such portions of land development, maintenance and responsibility for such portions shall fall upon the Township.

2. It is the intent of this Ordinance that the purposes of the Ordinance shall be carried out through the exercise of responsibility by private parties, and therefore it is anticipated that control plans shall be developed with the view towards projects, which can effectively be contained within the tracts to be owned and maintained by private parties. To foster this purpose, with respect to portions or parts of a project as shown on a plan of a developer or contractor, which portions will not otherwise become part of Township property, such portions shall become the responsibility of the individual property owners on whose property such portions of a project lie including but not limited to retention ponds, detention ponds, sediment basins, energy dissipators, or grassed water-ways. Persons including contractors and developers conveying property of a development to another party, which property contains any portions of a Land Disturbance Plan, after that plan has been established, shall include a specific deed reference to such grantee's responsibility for the maintenance and care of the portions of such project as are included within said grantee's conveyed property. The deed reference to such portions shall be in the form of a deed restriction imposing responsibilities upon said property owner for the maintenance of the portions of the project within the boundary lines of said property as may be necessary for proper maintenance of the project in accordance with the terms of this Ordinance. Such maintenance shall include the following:

   a. Liming and fertilizing vegetated channels and other areas according to specifications in the "Penn State Agronomy Guide."

   b. Reestablishment of vegetation by seeding and mulching or sodding of scoured areas or areas where vegetation has not been successfully established.

   c. Mowing as necessary to maintain adequate stands of grass and to control weeds. No stands of grass shall be permitted to exceed eight (8) inches in height.

   d. Removal of silt from all permanent structures, which trap silt or sediment in order to keep the material from building up in grass waterways thus reducing their capacity.

   e. Regular inspection (four times per year) of the areas in question to assure proper maintenance and care.

   f. Removal of silt from all permanent drainage structures, in particular BMPs, in order to maintain the design storage volumes.

3. The deed restrictions hereinabove mentioned shall also include notice that in the event the individual property owners should fail to comply with the terms of this Ordinance for the maintenance and care of the land in question, Heidelberg Township shall have the authority to carry out those duties hereby imposed upon individual property owners. The Township may, after giving notice to an individual property owner that he is not properly maintaining the areas subject to this

Ordinance, and by making demand that such compliance shall be made within thirty (30) days, enter upon said private property and take such actions as may be required to bring the area into compliance with this Ordinance. The Township shall further have the right to file a municipal lien against such property for the cost of maintenance work carried out under this section. The Township shall in addition to the filing of a municipal lien have any other remedies provided by law against any property owner who should fail to comply with the terms of this Ordinance.

4. Storm water management facilities existing on the effective date of this Ordinance on individual lots, which have not been accepted by the Township or for which maintenance responsibility has not been assumed by a private entity such as a homeowners' association, shall be maintained by the individual property owners. Such maintenance shall include at a minimum those items set forth in subsection (B) above. If the Township determines at any time that any permanent storm water management facility has been eliminated, altered, blocked through the erection of structures or the deposit of materials, or improperly maintained, the Township may determine that such condition constitutes a nuisance and shall notify the property owner of corrective measures which are required, and provide for a reasonable period of time, not to exceed thirty (30) days, within which the landowner shall take such corrective action. If the property owner does not take the required corrective action, the Township may either perform the work or contract for the performance of the work and bill the property owner for the cost of the work plus a penalty of ten percent (10%) of the cost of the work. If such bill is not paid by the property owner within thirty (30) days, the Township may file a municipal claim against the property upon which the work was performed in accordance with applicable laws.

5. Where the Board of Supervisors accepts dedication of all or some of the required storm water management facilities following completion, the Board of Supervisors may require the posting of financial security to secure structural integrity of said facilities as well as the functioning of said facilities in accordance with the design and specifications as depicted on the approved storm water management plan for a term not to exceed eighteen (18) months from the date of acceptance of dedication. Said financial security shall be the same type as required with regard to installation of such facilities, and the amount of the financial security shall not exceed fifteen percent (15%)of the actual cost of installation of said facilities.

SECTION 502 PERMANENCE OF STORM WATER MANAGEMENT FACILITIES

A. Permanence of Storm Water Management Facilities. No person shall modify, remove, fill, landscape or alter storm water management facilities and/or BMP facilities which may have been installed on a property unless a Storm Water Management Permit has been obtained to permit such modification, removal, filling, landscaping or alteration. No person shall place any structure, fill, landscaping or vegetation into a storm water management facility, a BMP facility or within a drainage easement.

SECTION 503 PROHIBITED DISCHARGES AND CONNECTIONS

A Prohibited Discharges

1. No person in the Township shall allow or cause to allow storm water discharges into the Township's separate storm sewer system, which are not composed entirely of storm water, except discharges allowed under a state or federal permit.

2. If the Township is issued a NPDES permit(s) for its storm sewer system or if any other person is issued an NPDES permit for storm water management facilities, the Township may allow discharges under such NPDES permit based upon finding by the Township or by PADEP that the discharge(s) do not significantly contribute to pollution to surface waters of the Commonwealth. Examples of discharges which the Township may allow are:

Water Line Flushing	Discharges from potable sources
Landscape irrigation	Discharges from fountain drains
Diverted stream flows	Air Conditioning Condensation
Rising groundwaters	Irrigation waters
Lawn watering	Flows from riparian habitats and wetlands
Street wash water	Uncontaminated pumped groundwater
Springs	Water from crawl space pumps
Individual residential car washing	Footing drains
De-chlorinated swimming pool discharges	Discharges from firefighting activities including training

3. In the event that the Township subsequently determines that any of the discharges identified in Section 503 1.B. significantly contribute to pollution of the Waters of the Commonwealth, the Township will notify the responsible person to cease the discharge.

4. Upon notice provided by the Township the discharger will have a reasonable time to cease the discharge consistent with the degree of pollution caused by the discharge.

B. Prohibited Connections

1. The following connections to the Township storm sewer or storm drainage systems are prohibited:

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

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

2. This prohibition expressly includes, without limitation, connections made in the past, regardless of whether the connections, drain or conveyance was previously allowed, permitted, or approved by a government agency, or otherwise permissible under law or practices applicable or prevailing at the time of connection.

C. Roof Drains

1. Roof drains shall not be connected to streets, sanitary or storm sewers or roadside ditches, except as provided in Section 503 C.2.

2. When it is more advantageous to connect directly to streets or storm sewers, connection to roof drains to streets or roadside ditches may be permitted on a case-by-case basis by the Township. It shall be the burden of the person seeking to make the connection to demonstrate to the Township that such connection is more advantageous and such connection shall not violate any state or federal statute, rule or regulation.

3. Roof drains shall discharge to infiltration areas or vegetative BMPs to the maximum extent possible.

D. Waste Disposal Prohibitions

No person shall throw, deposit, leave, maintain, keep, or permit to be thrown, deposited, left, or maintained in or upon any public or private property, driveway, parking area, street, alley, sidewalk, or other component of the Township's separate storm sewer system, any refuse, rubbish, garbage, litter, or other discarded or abandoned objects, articles, and accumulations, so that the same may cause or contribute to pollution. Wastes deposited in streets in proper waste receptacles for the purposes of collection are exempted from this prohibition.

ARTICLE VI
INSPECTIONS

SECTION 601 SCHEDULE OF INSPECTIONS

A. The Township, in conformance with Section 106, shall observe all scheduled phases of the installation, per the storm water management site plan, of any temporary or permanent storm water management facilities.

B. A schedule of required inspections shall be determined through a pre-construction meeting with Township staff.

C. Required inspections shall be scheduled through the Township a minimum of forty-eight (48) hours prior to the time the inspection is needed.

D. During any stage of the work, if the Township determines that any temporary or permanent storm water management facilities are not being installed in accordance with the approved Storm Water Management Site Plan, the Township may revoke any existing permits until a revised Storm Water Management Site Plan is submitted and approved, as specified in this Ordinance.

ARTICLE VII
ADMINISTRATION

SECTION 701 REMEDIES

Any person, partnership, or corporation engaged in a land disturbance activity, as defined in this Ordinance, shall implement such measures consistent with the Storm Water Management Permit and this Ordinance. Any land disturbance activity conducted in violation of this Ordinance or the Storm Water Management Permit is hereby declared a public nuisance.

In the event of a violation, Heidelberg Township may initiate the following actions:

A. Suspension of a Storm Water Management Permit: Any permit issued under this Ordinance may be suspended by the Township based upon:

1. The noncompliance with or failure to implement any provision of the Land Disturbance Plan, or

2. A violation of any provision of this Ordinance relating to the project, or

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

B. Under the suspension of a permit, only such work as the Township so authorized may proceed. This work shall be limited to that which is necessary to correct the violation.

A suspended permit shall be reinstated by the Township when:

1. The Enforcement Officer and the Township Engineer have inspected and approved the corrections to the storm water management facilities or the elimination of the hazard or nuisance, and;

2. The Enforcement Officer and the Township Engineer are satisfied that the violation of the Ordinance has been corrected.

C. Revocation of a Storm Water Management Permit: Based upon a report from the Township Engineer that the existing site condition or further construction is likely to endanger property or create hazardous conditions, the Township may:

1. Revoke a permit.

2. Require protective measures to be taken and assign a reasonable time period for the necessary action.

3. Authorize protective measures to be done and lien all cost of the work against the property on which work is required.

A permit, which has been revoked, cannot be reinstated. The applicant may apply for a new permit in accordance with the processing procedures in Article IV.

D. Notification of Suspension or Revocation of a Storm Water Management Permit: In the event of a suspension or revocation of a storm water management permit, the Township shall provide written notification, by certified mail, of the violation to the landowner at the landowner's last known address. Such notification shall:

1. Cite the specific violation, describe the requirements, which have not been met, and cite the provisions of the Ordinance relied upon.

2. Identify the specific protective measures to be taken.

3. Assign a reasonable time period necessary for action or in the case of revocation, identify if the Township has authorized protective measures to be performed at cost to the landowner.

4. Identify the right of the landowner to request a hearing before the Board of Supervisors if aggrieved by the suspension or revocation.

E. Abatement of Nuisance Conditions: The failure to complete site work in accordance with an approved Land Disturbance Plan or in a manner which violates the approved Land Disturbance Plan may result in harm to the water quality and other natural resources of the Township or may result in danger to the health, safety and welfare of the residents of the Township and, therefore, may constitute a nuisance. Where the Township determines that such conditions constitute a nuisance, they shall be abatable as such in accordance with the provisions of the Second Class Township Code, Act of May 1, 1933, P.L. 103, as reenacted and amended, §1529, 53 P.S. §§66529. The Township shall, in the notice of violation of approved plan forwarded in accordance with Section 701 D. herein, state whether the violations of the approved Land Disturbance Plan constitute a nuisance. The Township shall have the right to file its actual expenses in the abatement of such nuisances plus an additional twenty-five (25%) percent of such expenses shall be filed as a municipal claim against the property.

F. Civil Remedies:

1. The Township may institute any appropriate action at law or in equity for the enforcement of this Ordinance and to compel compliance with the requirements of this Ordinance.

2. The Township may revoke its approval of a Storm Water Management Permit if such Storm Water Management Permit has been issued in error or if the issuance was based on any misrepresentations or errors contained in the Application or otherwise made by the Applicant. The Township may also revoke approval of a

Storm Water Management Permit if the use and/or structure proposed by such Storm Water Management Permit violates any applicable Township, County, State or Federal law or regulation, including but not limited to the Heidelberg Township Zoning Ordinance.

G. Concurrent Remedies: The exercise of any remedy or imposition of any penalty under this Ordinance shall not prevent the Township from exercising any other remedy or penalty provided for by this Ordinance or available at law or in equity.

SECTION 702 VIOLATIONS AND PENALTIES

A. It shall be a violation of this Ordinance to commit or to permit any other person to commit any of the following acts:

1. To commence land disturbance activities for which this Ordinance requires a permit prior to obtaining a permit or in violation of the terms or conditions of any permit issued under this Ordinance.

2. To install, repair, modify, or alter storm water management facilities prior to obtaining a permit under this Ordinance or in a manner that violates the terms and conditions of any permit issued under this Ordinance.

3. To misuse or fail to maintain any storm water management facility installed upon a property.

4. To construct any improvements upon, grade, fill, or take any other action, which will impair the proper functioning of any storm water management facility.

5. To place intentionally false information on or intentionally omit information from an application for a permit under this Ordinance.

6. To fail to comply with any other provisions of this Ordinance.

B. If the Board of Supervisors or the officer designated to enforce this Ordinance by the Board of Supervisors determines that a person has committed or permitted the commission of a violation of this Ordinance, the Board of Supervisors or such enforcement officer shall inform such person in writing of the violation, shall notify such person to cease the violation of this Ordinance and shall inform such person that he or she must pay a civil penalty to the Township within the range of the amounts set forth below to settle the violation. The penalty for a first offense shall be not less than Fifty Dollars ($50.00) and not more than Six Hundred Dollars ($600.00); the penalty for a second offense shall not be less than One Hundred Dollars ($100.00) and not more than Six Hundred Dollars ($600.00); and the penalty for a third or greater offense shall be not less than Two Hundred Dollars ($200.00) and not more than Six Hundred Dollars ($600.00).

C. If such person fails or refuses to remit the penalty to the Township within ten days from the date of the written notice of violation of this Ordinance, the Township may commence a civil enforcement proceeding seeking penalties and costs for the violation of this Ordinance

and/or may commence an action in equity. The Township shall seek a judgment for the penalty previously imposed together with additional daily penalties for continuing violations plus all court costs, including the reasonable attorneys' fees incurred by the Township in the enforcement proceedings. If the defendant neither pays nor timely appeals the judgment, the Township may enforce the judgment pursuant to the applicable rules of civil procedure.

D. Each day that a violation continues shall constitute a separate violation, and each Section of this Ordinance, which is violated, shall constitute a separate violation.

SECTION 703 APPEALS

Appeals from any action of the Enforcement Officer under this Ordinance shall be made in writing to the Board of Supervisors within fifteen (15) days from the date of the written determination of the Enforcement Officer. All appeals shall be accompanied by the appeal fee established by resolution or ordinance of the Board of Supervisors.

A. The written appeal shall specify the precise action from which the appeal is taken and shall set forth in concise terms the reason for the appeal and any legal authorities supporting the appeal period.

B. If the appellant desires a hearing before the Board of Supervisors, the appellant must request a hearing in writing.

C. If a hearing is requested in writing, the Board of Supervisors shall conduct the hearing at a regular or special public meeting, which occurs not less than fourteen (14) days after receipt of the written appeal. The hearing shall be conducted in accordance with the provisions of the Local Agency Law, 2 Pa. C.S. §551 et seq.

D. The Board of Supervisors shall render a decision on the appeal in accordance with the provisions of the Local Agency Law.

E. Any person aggrieved by any decision of the Heidelberg Township Board of Supervisors may appeal to the Lebanon County Court of Common Pleas within thirty days of that decision.

SECTION 704 FEES

A. The applicant shall agree in writing to reimburse the Township for all costs of administration and review of the application by the Township Engineer or Consultant. Plan submittal fees for regulated activities both Major and Minor permits are established by Resolution of the Board of Supervisors. If problems arise requiring additional plan review time due to extensive plan revisions due to the inability to satisfy the requirements of this Ordinance, any resulting costs, including legal costs, that exceed the initial plan submittal fee, will be assessed to the applicant.

B. Excluding fixed administrative costs, the applicant shall be charged only for time and materials actually expended and detailed in bills from the Township Engineer or Consultant.

Any unexpended balance of the deposit for plan review shall be returned to the applicant following approval of the Land Disturbance Plan.

C. If actual time required of the Township Engineer or Consultant will exceed the deposited amount, the Township shall render to the applicant a preliminary statement of time and materials expended and an additional amount must be deposited with the Township prior to Plan approval.

D. Fees covering the cost of inspections shall be paid by the applicant to the Township prior to Plan approval. The amounts of these inspection fees shall be fixed by Resolution of the Board of Supervisors. If problems arise requiring more extensive involvement of the Township Engineer or Consultant during the inspection process, any resulting costs, including legal costs, that exceed the initial fees, will be assessed to the applicant.

SECTION 705 REPEALER

A. Except as otherwise required by law, this Ordinance is intended as a continuation of, and not a repeal of, existing regulations governing the subject matter. To the extent that this Ordinance restates regulations contained in ordinances previously in effect in Heidelberg Township, this Ordinance shall be considered a restatement and not a repeal of such regulations. It is the specific intent of the Board that all provisions of this Ordinance shall be considered in full force and effect as of the date such regulations were initially enacted. All ordinances or parts of ordinances inconsistent with the provisions of this Ordinance are hereby repealed. It is expressly provided that the provisions of this Ordinance shall not affect any act done, contract executed or liability incurred prior to its effective date, or affect any suit or prosecution pending or to be instituted to enforce any rights, rule, regulation or ordinance, or part thereof, or to punish any violation which occurred under any prior storm water management or earth disturbance regulation or ordinance of Heidelberg Township, prosecution may be initiated against the alleged offender pursuant to the provisions of said prior storm water management or earth disturbance regulation or ordinance, and the provisions and penalties provided in said prior storm water management or earth disturbance regulation or ordinance shall remain effective as to said violation.

SECTION 706 ADOPTION AND EFFECTIVE DATE

Nothing in this Ordinance shall be construed to affect any suit or proceeding pending in any court, or any rights acquired or liability incurred, or any permit issued, or any cause or causes of action existing under the Zoning Ordinance or the Subdivision and Land Development Ordinance of Heidelberg Township prior to the enactment of this Ordinance.

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

DULY ENACTED AND ORDAINED this _____ day of _____, 2006, by the Board of Township Supervisors of Heidelberg Township, Lebanon County, Pennsylvania, in lawful session duly assembled.

HEIDELBERG TOWNSHIP
LEBANON COUNTY,
PENNSYLVANIA

Attest: _____ By: _____
Secretary Chairman, Board of Supervisors

(TOWNSHIP SEAL)

CERTIFICATE

I, the undersigned, Secretary of Heidelberg Township (the "Township"), certify that: the foregoing is a true and correct copy of an Ordinance of the Board of Supervisors of Heidelberg Township which duly was enacted by affirmative vote of a majority of the members of the Board Supervisors of the Township at a meeting duly held on the _____ day of _____, 2006; such Ordinance duly has been recorded in the Ordinance Book of the Township; such Ordinance duly has been published as required by law; and such Ordinance remains in effect, unaltered and unamended, as of the date of this Certificate.

I further certify that the Board of Supervisors of Heidelberg Township met the advance notice requirements of Act No. 1986-84 of the General Assembly of the Commonwealth of Pennsylvania, approved July 3, 1986, by advertising said meeting and by posting prominently a notice of said meeting at the principal office of the Township or at the public building in which said meeting was held, all in accordance with such Act.

IN WITNESS WHEREOF, I set my hand and affix the official seal of the Township, this _____ day of_____, 2006.

_____

SECRETARY

(TOWNSHIP SEAL)

APPENDICES

APPENDIX 1

APPLICATION FOR A STORM WATER MANAGEMENT PERMIT
MINOR LAND DISTURBANCE ACTIVITY

HEIDELBERG TOWNSHIP
Lebanon County, Pennsylvania

File No. _____

Date Received _____

Application is hereby made to Heidelberg Township for the issuance of a storm water management permit pursuant to the specifications herewith submitted.

1. Name of Property Owner(s):_____

   Address:_____Phone _____

2. Project Location:_____
   _____

3. Brief Description of Work to be Performed:_____
   _____
   _____
   _____

A general plan of the lot configuration, building location, grading, and storm water management facilities shall be provided.

4. Name of applicant (if other than owner):
   Address:_____ Phone_____

The undersigned hereby represents that, to the best of his knowledge and belief, all information listed above and on the storm water management plan herewith submitted is true, correct, and complete. _____ Date_____
Signature of Applicant

PLEASE COMPLETE THE MINOR LAND DISTURBANCE PLAN AND SUBMIT WITH APPLICATION

(See Appendix 21 and 21a for Blank Plan and Example Plan)

APPENDIX 2

APPLICATION FOR A STORM WATER MANAGEMENT PERMIT
MAJOR LAND DISTURBANCE ACTIVITY

HEIDELBERG TOWNSHIP
Lebanon County, Pennsylvania

File No._____

Date Received_____

Application is hereby made to Heidelberg Township for the issuance of a Storm Water Management Permit pursuant to the specifications herewith submitted.

1. Name of Property Owner(s):
   Address:_____Phone _____

2. Project Location:_____

3. Type of Earth Disturbance Activity:

   A. New impervious or semi-impervious surface_____(sq. ft./ac.)
   B. Diversion or piping of natural or man-made watercourse_____(linear ft.)
   C. Installation of the following:

      Culvert _____
      Detention basin _____
      Retention basin _____
      Sediment basin _____
      Other _____

   D. Removal of ground cover, grading, filling, or excavation _____ (sq. ft./ac.)

4. Land disturbance plan prepared by:
   Address:_____Phone_____

5. Name of applicant (if other than owner):_____ Address:
   _____Phone_____

   The undersigned hereby represents that, to the best of his knowledge and belief, all information listed above and on the land disturbance plan herewith submitted is true, correct, and complete.

   _____ _____
   Signature of Applicant Date

APPENDIX 3

STORM WATER MANAGEMENT PERMIT

HEIDELBERG TOWNSHIP
Lebanon County, Pennsylvania

Minor Land Disturbance

Permit No. _____

The property of _____ located at _____ has received approval of the land disturbance plans dated _____. Construction may proceed in accordance with approved plans and permit inspection schedule.

Enforcement Officer _____

Date _____

Major Land Disturbance

Permit No._____

The property of _____ located at _____ has received approval of the land disturbance plans dated _____. Construction may proceed in accordance with approved plans and permit inspection schedule.

Board of Supervisors_____

Date_____

APPENDIX 4

STORM WATER MANAGEMENT PERMIT INSPECTION SCHEDULE

Heidelberg Township
Lebanon County, Pennsylvania

The property of _____
located at _____
has received approval of the storm water management plans dated _____ .
Construction may proceed in accordance with the schedule below. No work shall begin on a subsequent phase until the preceding phase has been inspected and approved.

Inspector: _____
Date: _____

SCHEDULE OF INSPECTIONS

_____ Preliminary site preparation, including stripping of vegetation, stockpiling of topsoil, and construction of temporary storm water management facilities.

_____ Rough grading (not including placing topsoil, permanent drainage, or other site development improvements and ground covers).

_____ Construction of the following specific storm water management facilities:

_____

_____

_____

_____

_____ Construction of all permanent storm water management facilities, including ground covers and plantings.

_____ Final grading, vegetative control measures, or other site restoration work.

APPENDIX 5

RAINFALL INTENSITY-DURATION-FREQUENCY CHART						
LEBANON COUNTY, PENNSYLVANIA						
Storm Event –	2 yrs.	5 yrs.	10 yrs.	25 yrs.	50 yrs.	100 yrs.
Time of Concentration (Minutes)	Rainfall Intensity (Inches/Hour)					
5	4.19	4.89	5.41	5.99	6.61	7.32
6	3.94	4.61	5.15	5.71	6.28	6.96
7	3.73	4.37	4.93	5.45	5.99	6.64
8	3.54	4.16	4.72	5.22	5.73	6.36
9	3.38	3.98	4.54	5.02	5.50	6.11
10	3.24	3.81	4.37	4.83	5.30	5.88
11	3.11	3.67	4.21	4.66	5.11	5.67
12	2.99	3.53	4.07	4.50	4.94	5.49
13	2.88	3.41	3.94	4.36	4.78	5.31
14	2.79	3.30	3.82	4.22	4.64	5.15
15	2.70	3.20	3.70	4.10	4.50	5.00
16	2.62	3.10	3.60	3.98	4.38	4.87
17	2.54	3.02	3.50	3.88	4.26	4.74
18	2.47	2.93	3.41	3.77	4.15	4.62
19	2.40	2.86	3.32	3.68	4.05	4.50
20	2.34	2.78	3.24	3.59	3.95	4.40
21	2.80	2.72	3.16	3.50	3.86	4.30
22	2.23	2.65	3.09	3.42	3.78	4.20
23	2.17	2.59	3.02	3.35	3.69	4.11
24	2.12	2.54	2.95	3.28	3.62	4.03
25	2.08	2.48	2.89	3.21	3.54	3.95
26	2.03	2.43	2.83	3.14	3.47	3.87
27	1.99	2.38	2.77	3.08	3.41	3.79
28	1.95	2.34	2.71	3.02	3.34	3.72
29	1.91	2.29	2.66	2.96	3.28	3.66
30	1.88	2.25	2.61	2.91	3.22	3.59
35	1.71	2.06	2.39	2.66	2.96	3.03
40	1.58	1.91	2.20	2.46	2.75	3.06
45	1.47	1.77	2.05	2.29	2.57	2.86
50	1.38	1.66	1.91	2.14	2.41	2.69
55	1.29	1.57	1.79	2.01	2.27	2.53
60	1.22	1.48	1.69	1.90	2.15	2.40

Source: Pennsylvania Department of Transportation, Region 4 Intensity-Duration-Chart, developed by Penn State University, Department of Engineering, October 1986.

APPENDIX 6

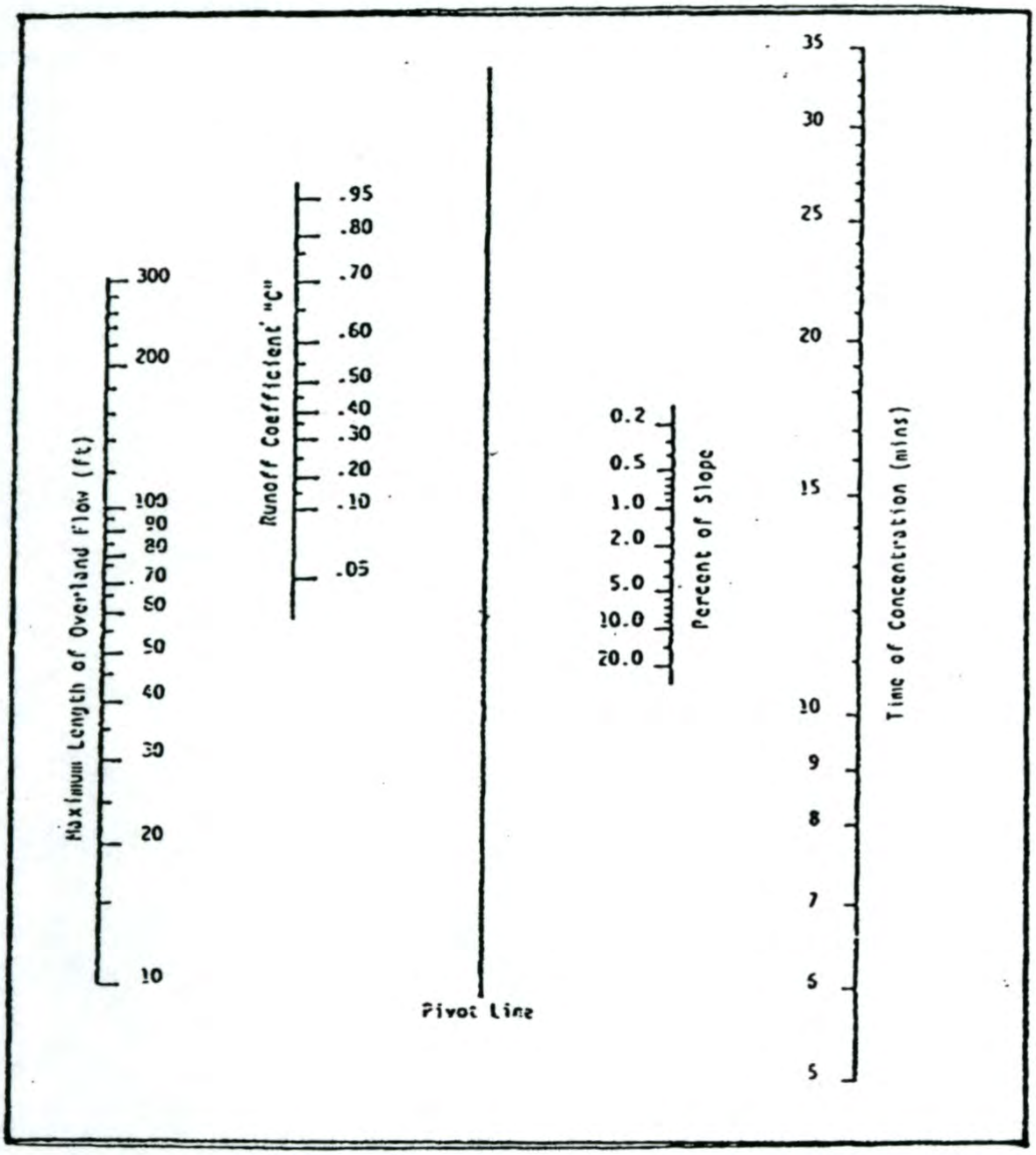
Runoff Coefficients "C" for Rational Formula												
Soil Group	A			B			C			D		
Slope / Land Use	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
Cultivated Land												
winter conditions	.14	.23	.34	.21	.32	.41	.27	.37	.48	.34	.45	.56
summer conditions	.10	.16	.22	.14	.20	.28	.19	.26	.33	.23	.29	.38
Fallowed Fields												
poor conditions	.12	.19	.28	.17	.25	.34	.23	.33	.40	.27	.35	.45
good conditions	.08	.13	.16	.11	.15	.21	.14	.19	.26	.18	.23	.31
Forest/Woodland	.08	.11	.14	.10	.14	.18	.12	.16	.20	.15	.20	.25
Grass Areas												
good conditions	.10	.16	.20	.14	.19	.26	.18	.22	.30	.21	.25	.35
average conditions	.12	.18	.22	.16	.21	.28	.20	.25	.34	.24	.29	.41
poor conditions	.14	.21	.30	.18	.28	.37	.25	.35	.44	.30	.40	.50
Impervious Areas	.90	.91	.92	.91	.92	.93	.92	.93	.94	.93	.94	.95
Weighted Residential												
Lot size 1/8 acre	.29	.33	.36	.31	.35	.40	.34	.38	.44	.36	.41	.48
Lot size 1/4 acre	.26	.30	.34	.29	.33	.38	.32	.36	.42	.34	.38	.46
Lot size 1/3 acre	.24	.28	.31	.26	.32	.35	.29	.35	.40	.32	.36	.45
Lot size 1/2 acre	.21	.25	.28	.24	.27	.32	.27	.31	.37	.30	.34	.43
Lot size 1 acre	.18	.23	.26	.21	.24	.30	.24	.29	.36	.28	.32	.41

APPENDIX 7

Runoff Curve Numbers "CN" for SCS Method												
Soil Group	A			B			C			D		
Slope / Land Use	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
Cultivated Land												
winter conditions	48	60	75	62	73	82	68	78	90	77	88	95
summer conditions	35	51	58	48	55	65	57	65	73	64	69	79
Fallowed Fields												
poor conditions	45	54	65	56	63	73	64	74	81	69	77	87
good conditions	30	44	48	43	48	55	48	54	63	56	60	68
Forest/Woodland	30	40	43	42	46	50	45	50	53	50	56	61
Grass Areas												
good conditions	35	51	53	48	54	63	56	59	73	62	63	79
average conditions	45	53	58	52	55	65	60	63	75	65	69	82
poor conditions	48	55	67	56	67	77	66	74	85	73	81	90
Impervious Areas	96	97	98	96	97	98	96	97	98	96	97	98
Weighted Residential												
Lot size 1/8 acre	71	75	78	74	76	82	78	80	87	81	83	90
Lot size 1/4 acre	62	67	71	66	69	76	67	69	76	75	78	88
Lot size 1/3 acre	59	65	69	64	66	74	65	66	75	74	77	87
Lot size 1/2 acre	57	63	68	62	64	73	63	65	73	72	76	86
Lot size 1 acre	55	62	67	61	63	72	61	64	72	71	75	85

APPENDIX 8

TIME OF CONCENTRATION NOMOGRAPH
(for use with the Rational Method)



APPENDIX 9

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

Project _____ By _____ Date _____

Location _____ Checked _____ Date _____

Circle one: Present Developed _____

Circle one: T_c T_t through subarea _____

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

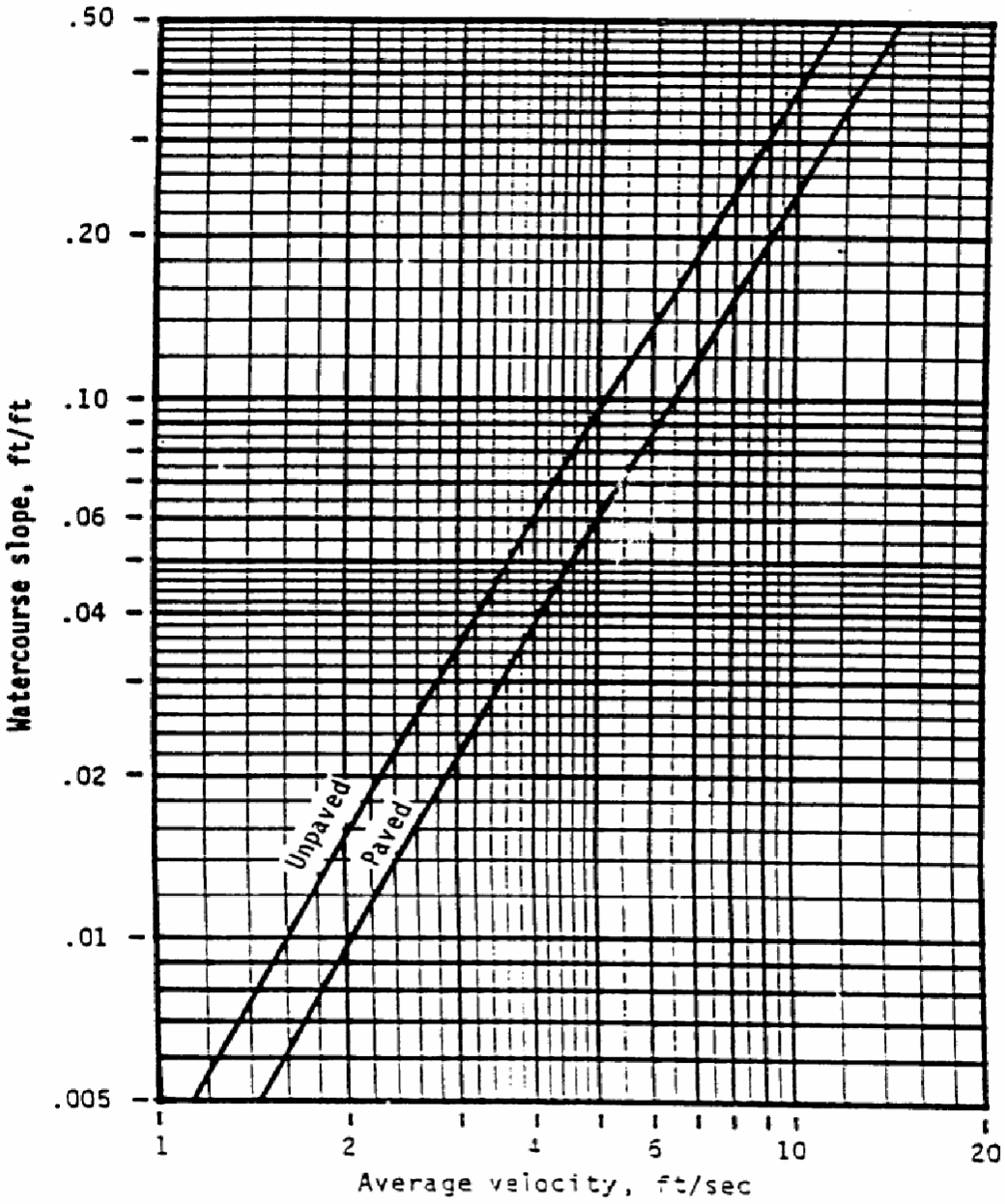
Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)	**Segment ID**			
1. Surface description (table 3-1)				
2. Manning's roughness coeff., n (table 3-1)				
3. Flow length, L (total L ≤ **150 ft) ft				
4. Two-yr 24-hr rainfall, P_2 in				
5. Land slope, s ft/ft				
6. $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$ Compute T_t hr		+		=
Shallow concentrated flow	**Segment ID**			
7. Surface description (paved or unpaved)				
8. Flow length, L ft				
9. Watercourse slope, s ft/ft				
10. Average velocity, V (figure 3-1) ft/s				
11. $T_t = \frac{L}{3600\,V}$ Compute T_t hr		+		=
Channel flow	**Segment ID**			
12. Cross sectional flow area, a ft^2				
13. Wetted perimeter, P_w ft				
14. Hydraulic radius, $r = \frac{a}{P_w}$ Compute r ft				
15. Channel slope, s ft/ft				
16. Manning's roughness coeff., n				
17. $V = \frac{1.49\,r^{\frac{2}{3}}\,s^{\frac{1}{2}}}{n}$ Compute V ft/s				
18. Flow length, L ft				
19. $T_t = \frac{L}{3600V}$ Compute T_t hr		+		=
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19) hr				

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

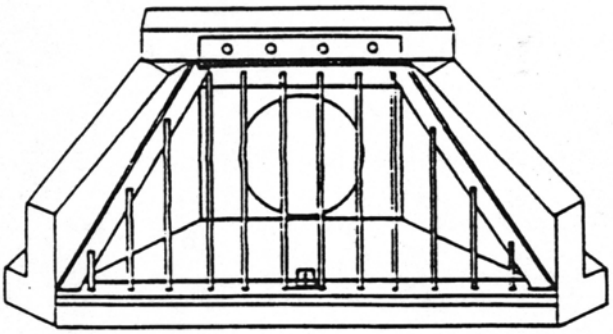
APPENDIX 10

AVERAGE VELOCITIES FOR ESTIMATING TRAVEL TIME FOR SHALLOW CONCENTRATED FLOW



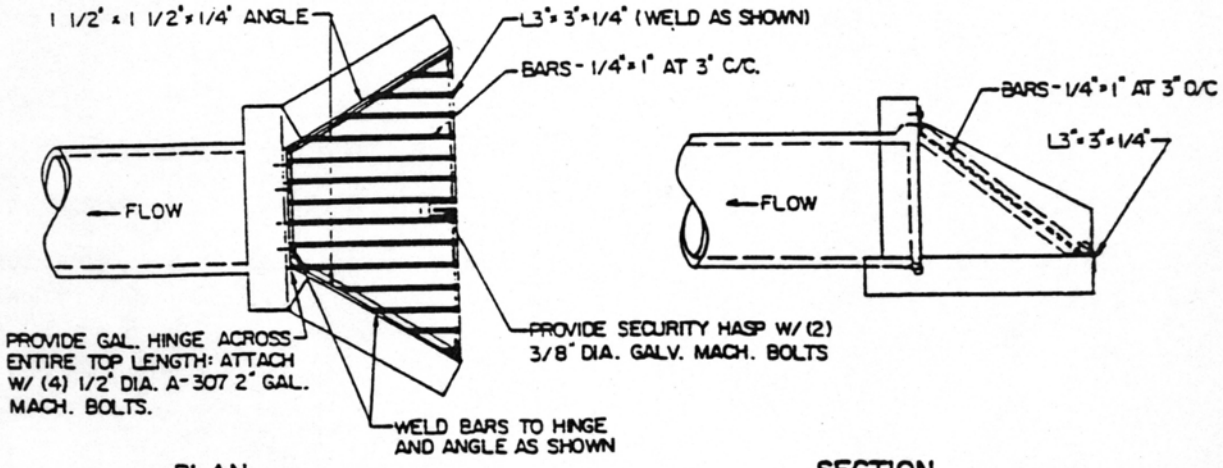
(210-VI-TR-55, Second Ed., June 1986)

APPENDIX 11



ISOMETRIC

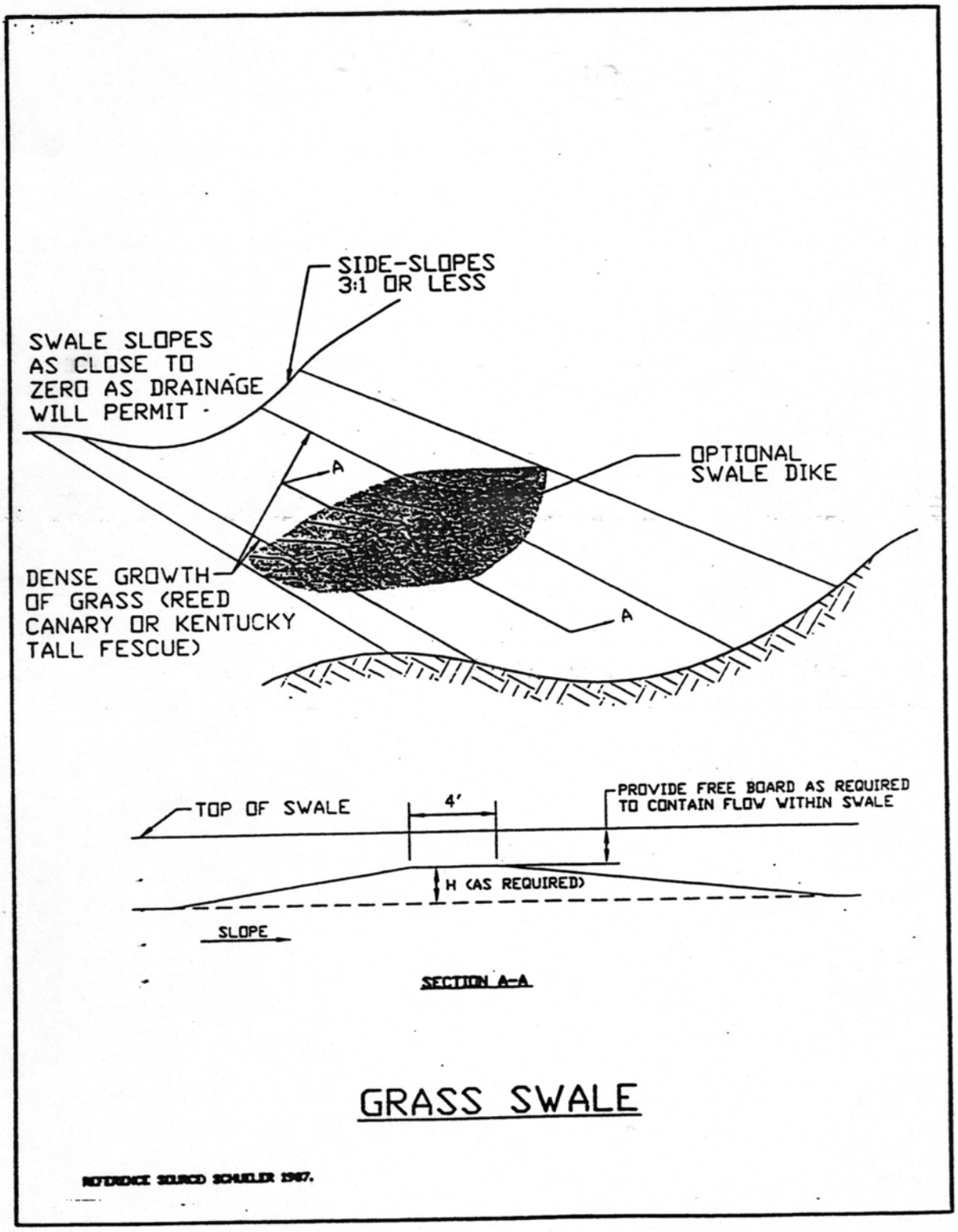
NOTES:
1. MATERIAL TO BE: GALVINIZED, STEEL W/ RUST INHIBITOR, OR ALUMINUM.
2. DIMENSION APPROPRIATELY FOR HEADWALL UTILIZED.



TRASH RACK DETAIL (TYPE 'DW' HEADWALLS ONLY)
NO SCALE

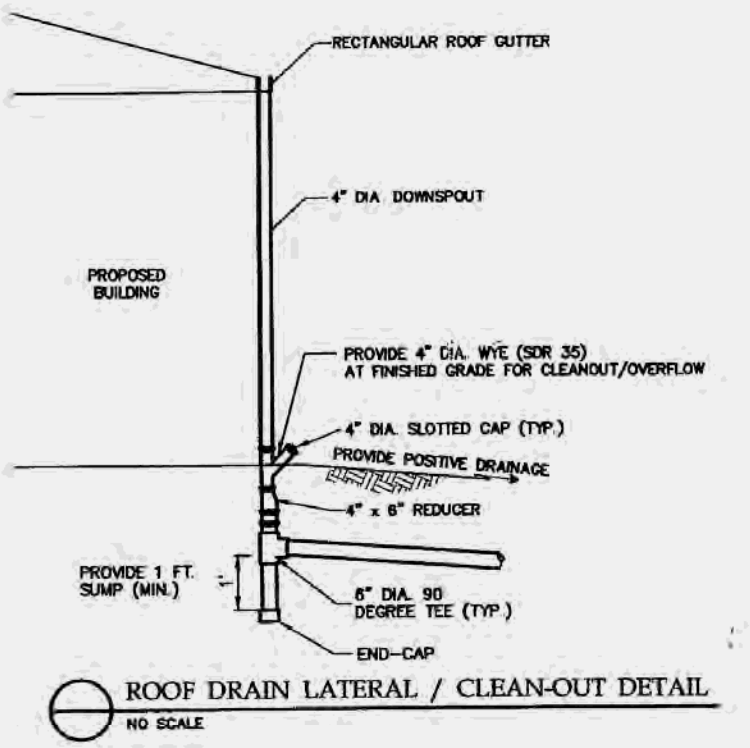
Note: This is an example. Actual design, size and shape may vary as long as function is met.

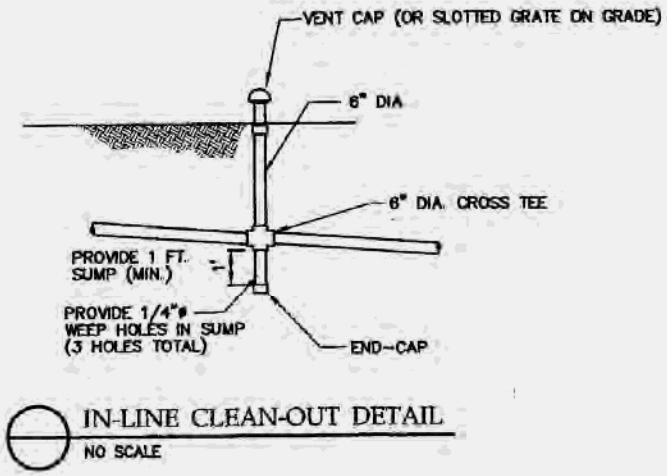
APPENDIX 12



Note: This is an example. Actual design, size and shape may vary as long as function is met.

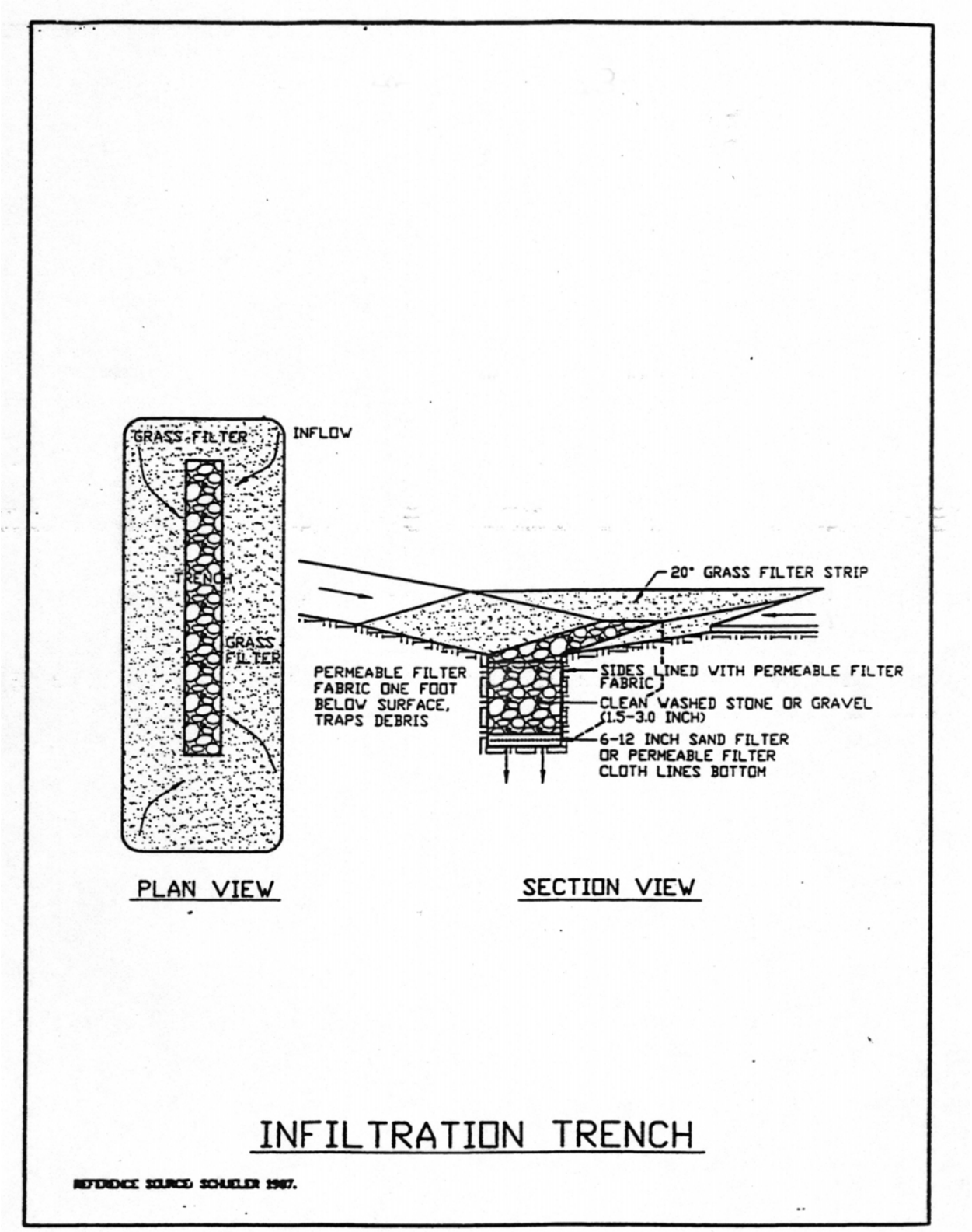
APPENDIX 13





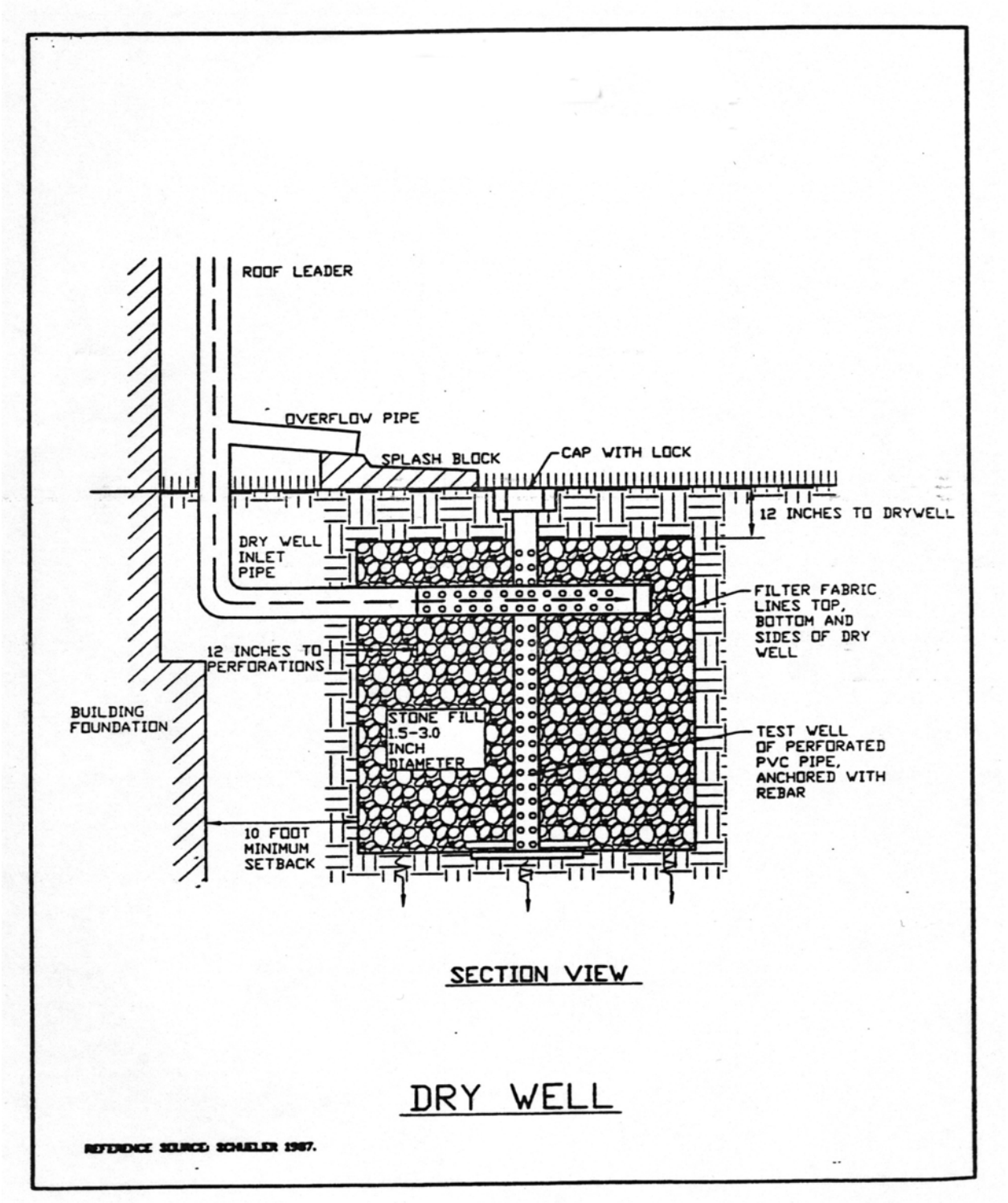
Note: This is an example. Actual design, size and shape may vary as long as function is met.

APPENDIX 14



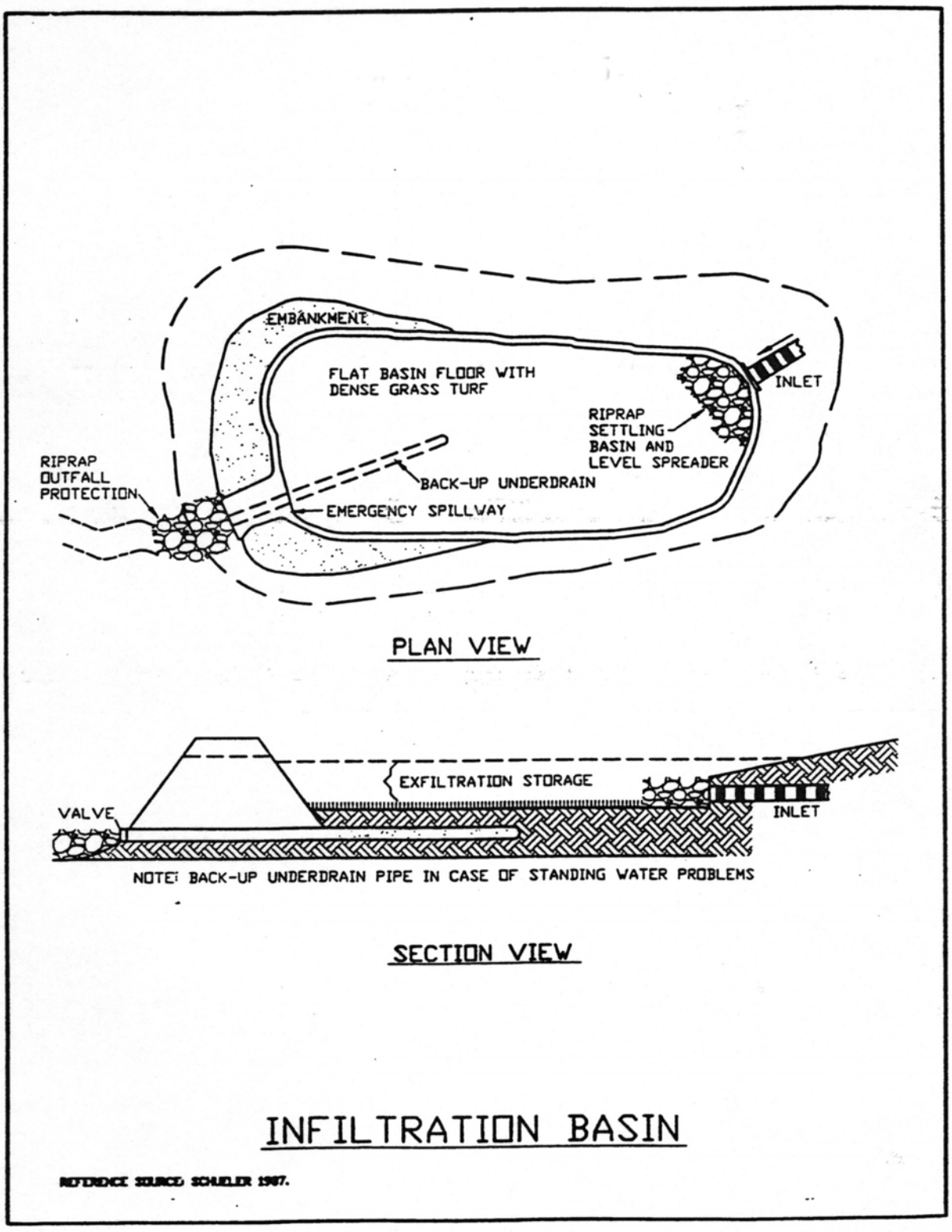
Note: This is an example. Actual design, size and shape may vary as long as function is met.

APPENDIX 15



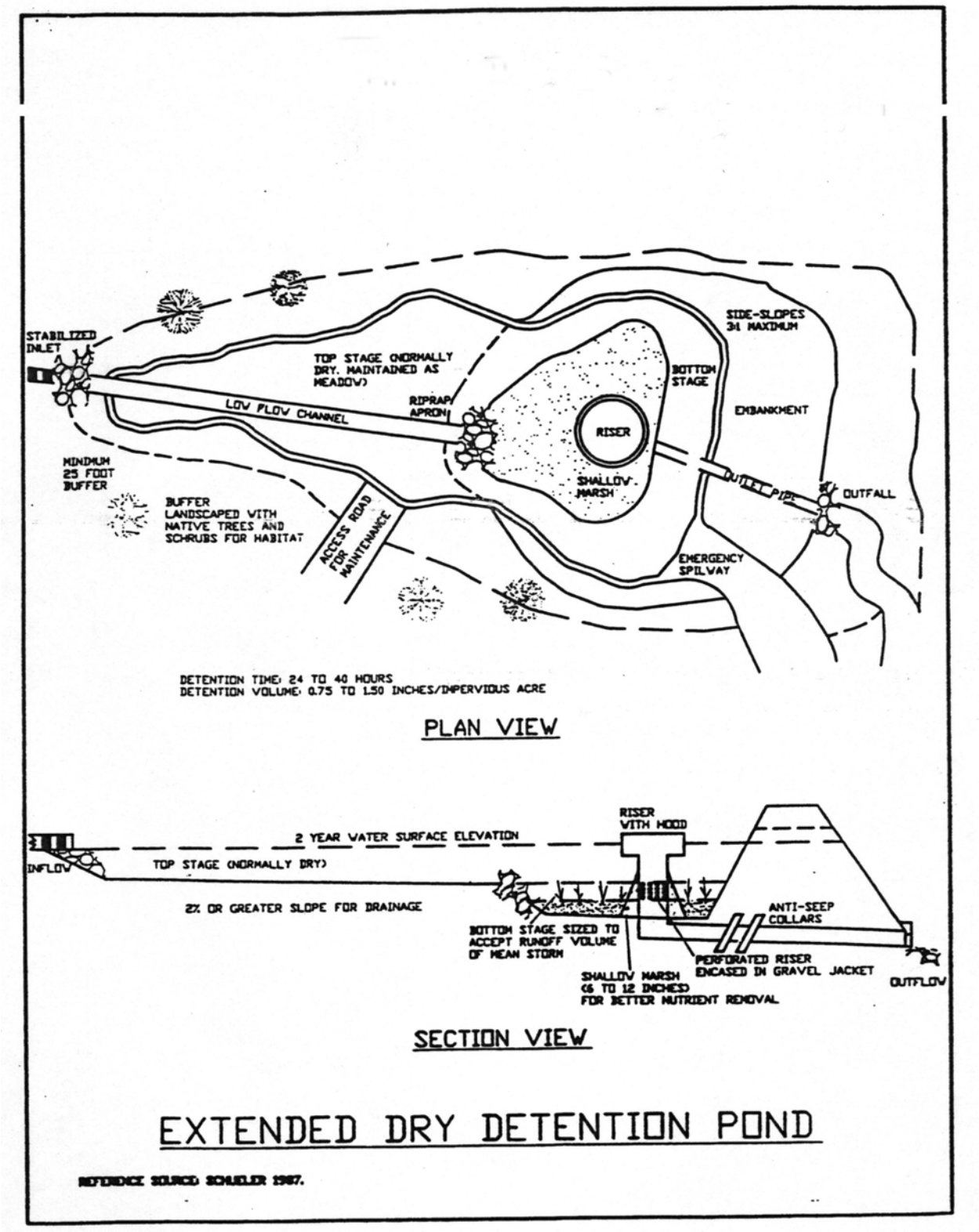
Note: An in-line sump with cleanout access shall be provided between the roof leader and the drywell/infiltration bed/leach ring or other similar infiltration facility. This is an example. Actual design, size and shape may vary as long as function is met.

APPENDIX 16



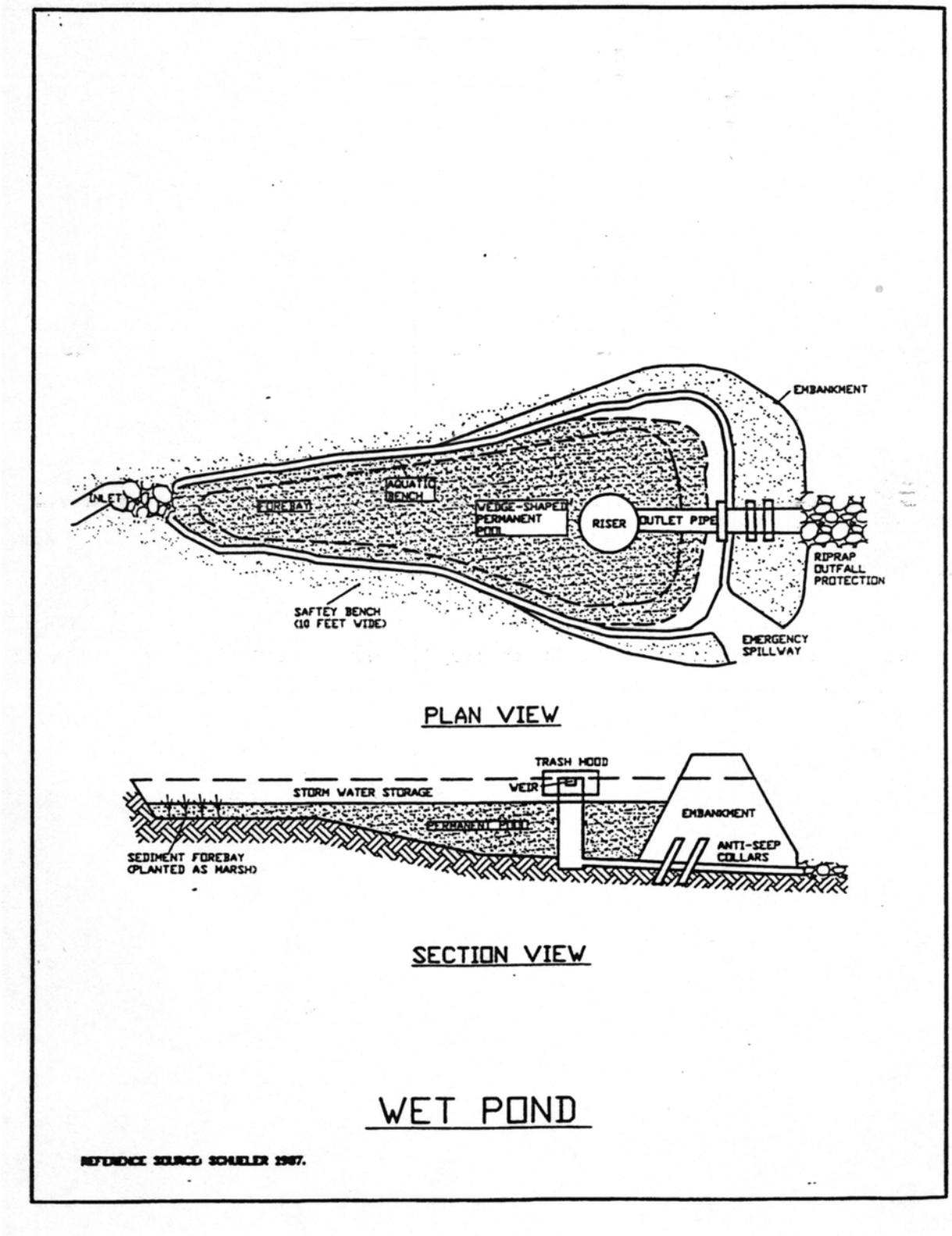
Note: This is an example. Actual design, size and shape may vary as long as function is met.

APPENDIX 17



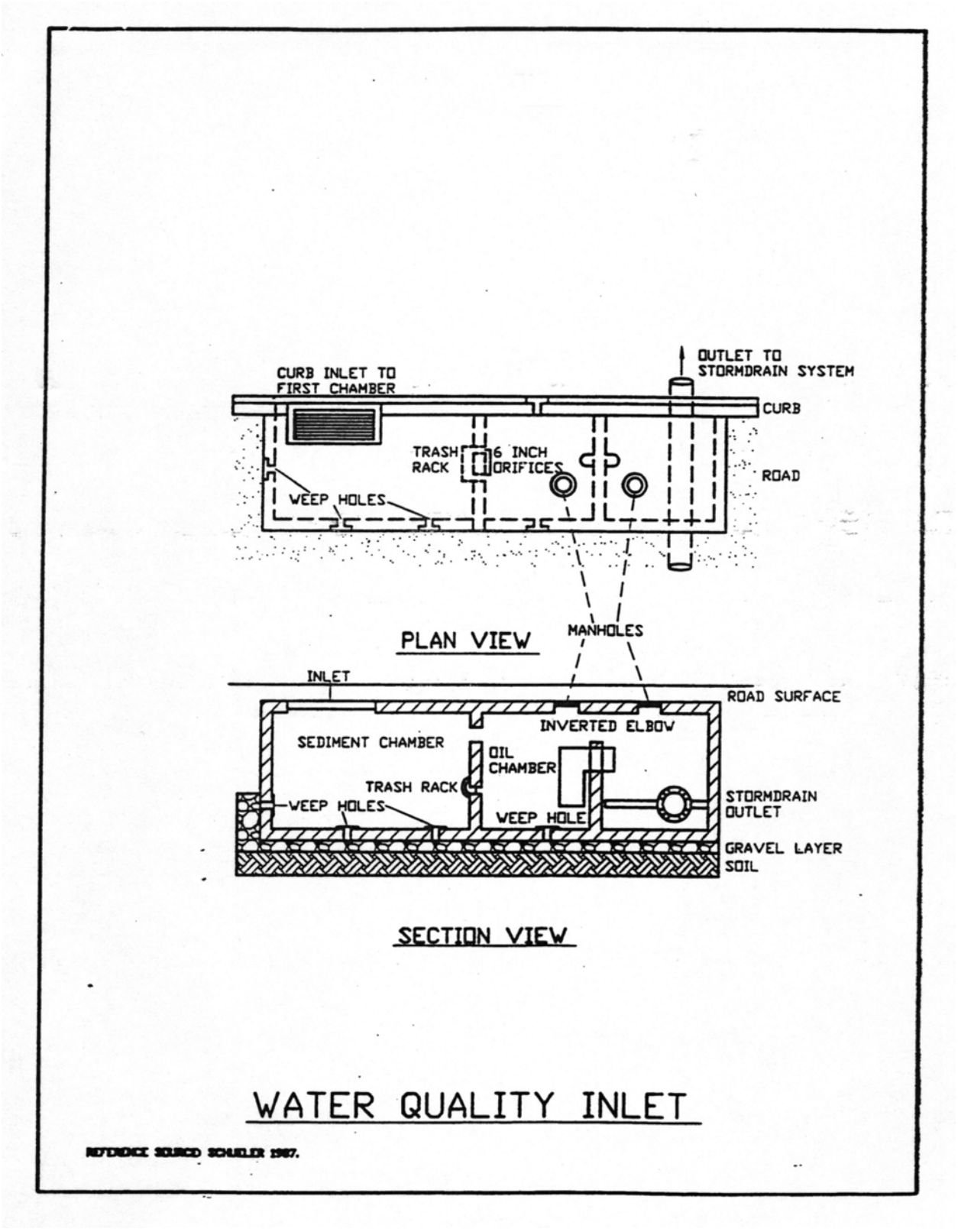
Note: This is an example. Actual design, size and shape may vary as long as function is met.

APPENDIX 18



Note: This is an example. Actual design, size and shape may vary as long as function is met.

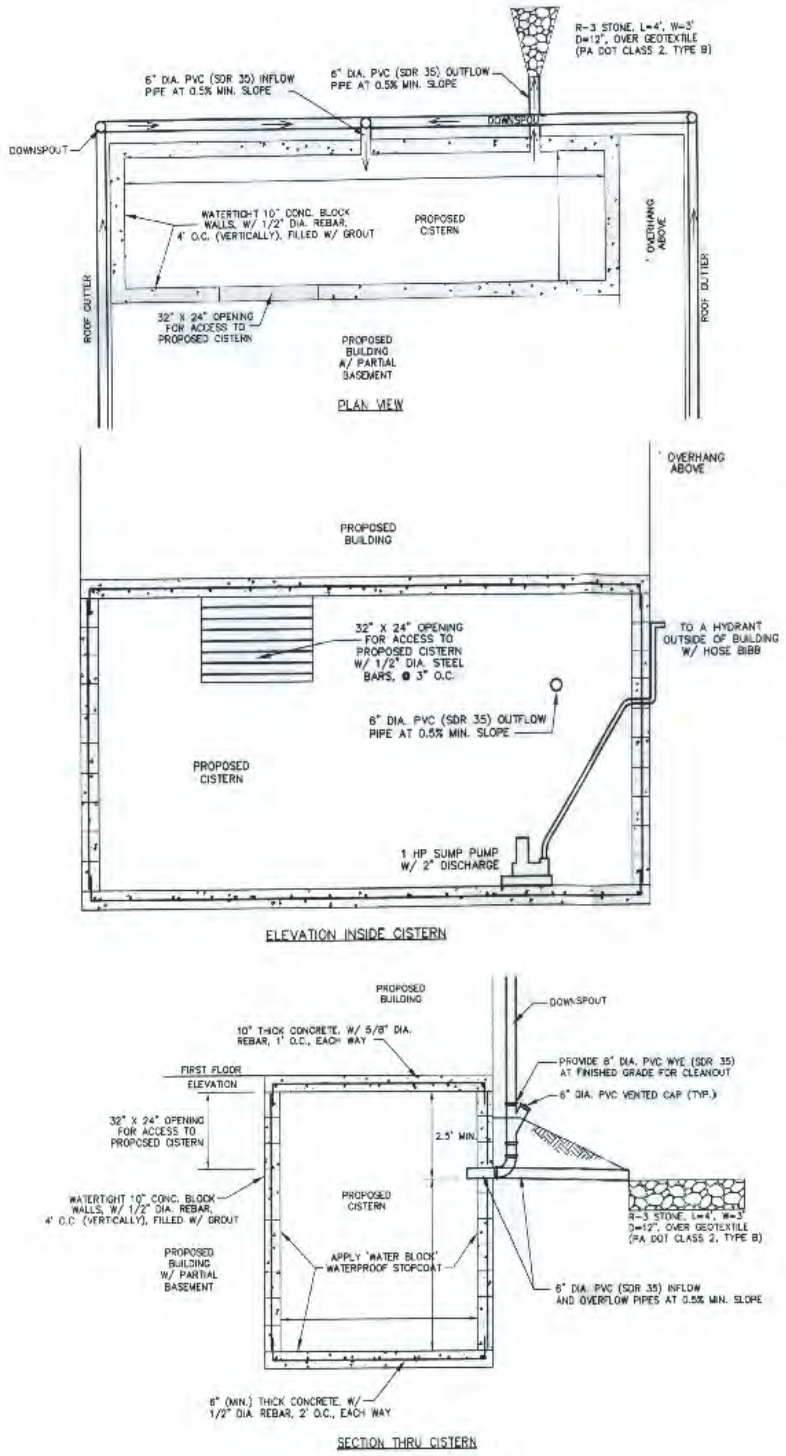
APPENDIX 19



Note: This is an example. Actual design, size and shape may vary as long as function is met.

APPENDIX 20

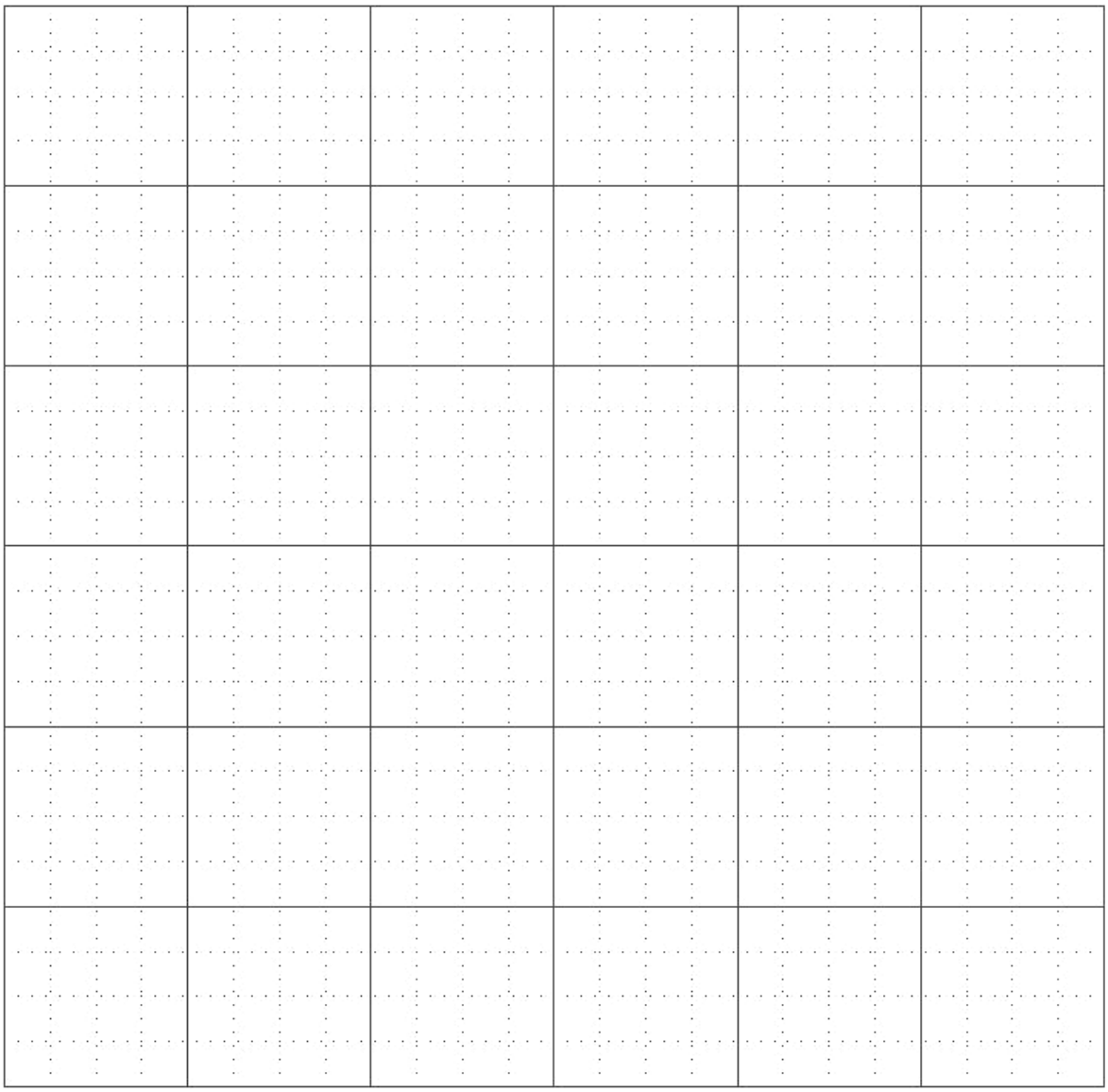
CISTERN



Note: Actual size and shape of cistern will vary depending on required amount of storm water storage volume. This is an example. Actual design, size and shape may vary as long as function is met. External access must be provided with a lockable mechanism. All cisterns shall include structural design information for review prior to approval

APPENDIX 21

MINOR LAND DISTURBANCE PLAN



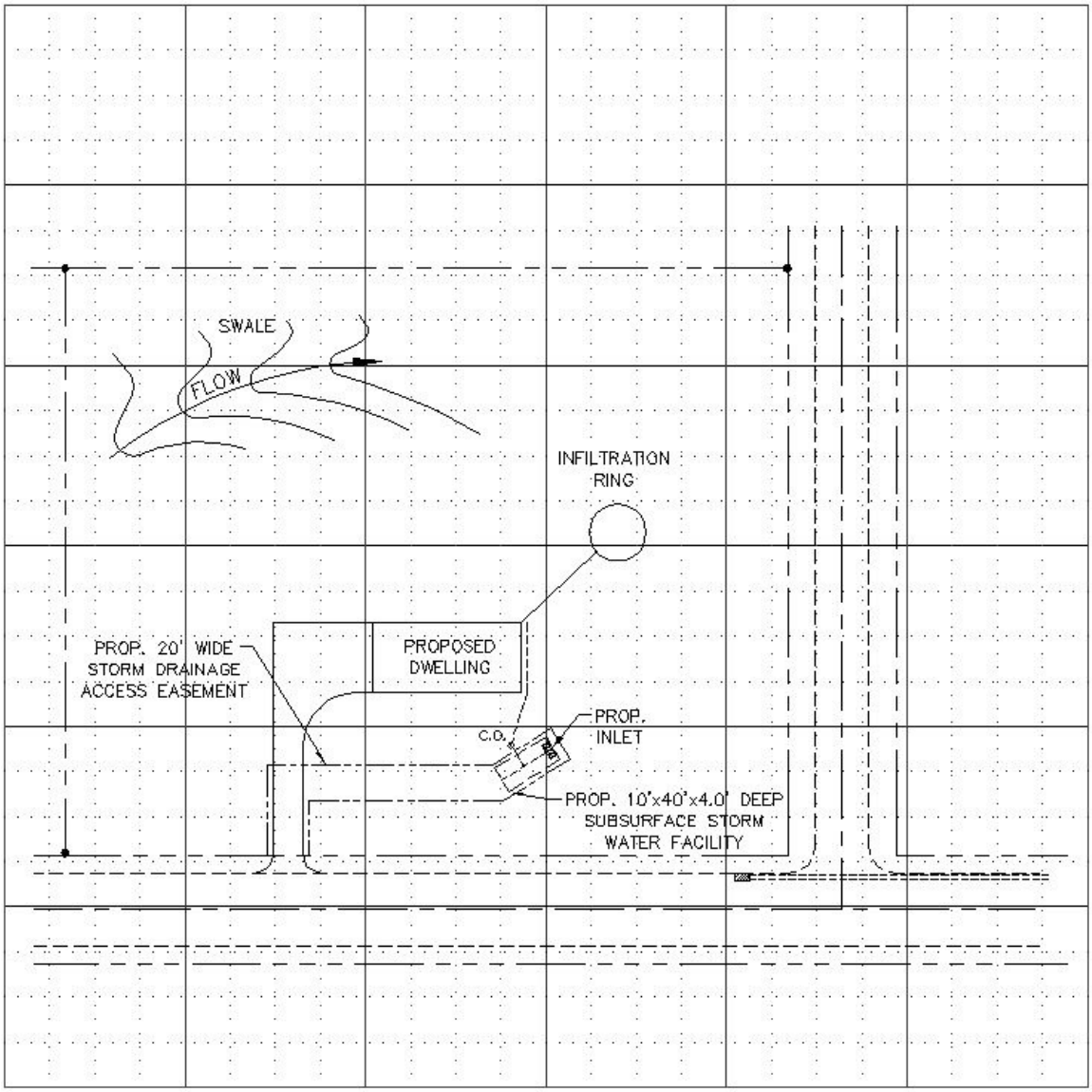
Scale: 1" = _____(4 squares per inch)

The following shall be shown on the Plan:

Lot Configuration	Berms	Infiltration System
Building Location	Terraces	Swales
Contours or Flow Arrows	Bridges	Watercourses
Storm Sewers	Dams	Floodplains
Detention Basins	Retention Basins	Inlets
Cisterns	Seepage Beds	Leach Rings
Sidewalks	Driveways	Patios

APPENDIX 21a

MINOR LAND DISTURBANCE PLAN (EXAMPLE)



Scale: 1" = _____(4 squares per inch)

The following shall be shown on the Plan:

Lot Configuration	Berms	Infiltration System
Building Location	Terraces	Swales
Contours or Flow Arrows	Bridges	Watercourses
Storm Sewers	Dams	Floodplains
Detention Basins	Retention Basins	Inlets
Cisterns	Seepage Beds	Leach Rings
Sidewalks	Driveways	Patios

APPENDIX 22

CERTIFICATE FOR APPROVAL BY THE BOARD OF SUPERVISORS

Approved by the Heidelberg Township Board of Supervisors this ____ day of _____,

200___

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APPENDIX 23

CERTIFICATE FOR REVIEW BY THE PLANNING COMMISSION

Reviewed by the Heidelberg Township Planning Commission this ____ day of _____,

200___

==========

APPENDIX 24
CERTIFICATE FOR REVIEW BY THE TOWNSHIP ENGINEER
(if required by the Township)

Reviewed by the Heidelberg Township Engineer this ____ day of _____, 200___

APPENDIX 25

STORM WATER MANAGEMENT CERTIFICATION

I hereby certify that, to the best of my knowledge, the storm water management facilities shown and described hereon are designed in conformance with the Heidelberg Township Storm Water Management and Earth Disturbance Ordinance of 2006.

_____, 200_____ *

**

* Signature of the registered professional responsible for the preparation of the plan.
** Seal of the individual

APPENDIX 26

STORM WATER MANAGEMENT EXEMPTION CRITERIA

Existing Developed Properties:

Lands improved with existing structures as of the date of adoption of this Ordinance (effective date) may be exempted for an additional 1,000 square feet of impervious surface in all Zoning Districts provided that the total impervious surfaces do not exceed ten thousand (10,000) square feet in the aggregate and flows from the site after development leave the site in the same manner as the pre-development condition and there are no adverse effects to the adjacent property (ies). This exemption is limited to Single-Family Residential Dwellings and Two-Family detached and semi-detached Residential Dwellings and is not to be construed to include single unit mobile homes unless located on separate parcels (non-mobile home park).

Wellhead Protection Areas

Wellhead protection areas are exempt from certain types of storm water management facilities as listed in Appendix 26 for specific Wellhead Protection Zones as shown on the drainage district mapping in Appendix 27.

Existing Properties in Effective Agricultural Use Areas:

The following criteria shall apply to all existing lots in effective agriculture** areas (1 lot per 20 acres or larger***).

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

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

** All farms for which an exemption is requested shall have a Conservation Plan approved by the appropriate officials. For existing Farms outside of the Agricultural Zoning District, the exemptions shall only apply where the property is still used as a functioning Farm in accordance with the definition of Agricultural use. A Permitted Use within an Agricultural Zoning District that is not an Agricultural use by definition is not eligible for the above exemptions

*** All parcels under consideration for this exemption must provide proof that they were subdivided from the parent tract of at least 20 acres in size with no more than one (1) lot subdivided from the parent tract for each 20 acres of the said parent tract. Any lot subdivided from a parent tract of less than 20 acres or more than one lot subdivided from the same parent

tract for each 20 acres of said parent tract is not eligible for the above exemptions for Effective Agricultural Use Areas

Forestry Operation Exemptions

Forestry operations as defined in Section 201 of this Ordinance are exempt provided that a Timber Harvesting Plan is submitted and approved by the Lebanon County Conservation District. Clear cutting for later Land Development purposes does not qualify for this exemption.

Maintenance of Utility Lines:

Linear Land Disturbance involving the maintenance and/or replacement of underground Utility Lines is exempt from the requirements of this Ordinance with regard to obtaining a Minor or Major Land Disturbance Permit. Such Linear Land Disturbance shall be exempt provided that the actual disturbance is limited only to the trenching required for the maintenance and/or replacement of such Linear Utility Line. The Enforcement Officer shall determine through field visits if the work involved meets the Linear Land Disturbance exemption criteria. All such linear construction/maintenance shall satisfy the requirements of the Lebanon County Conservation District as well as any other permits required by any other governing agency as stated in Section 108 of this Ordinance. Evidence of such permits and/or approved plans shall be available at the job site at all times at the request of the Enforcement Officer. All runoff flowing from the Linear Land Disturbance area after restoration/stabilization shall leave the area in the same manner as the pre-development condition and there are no adverse effects to the adjacent property(ies).

This linear exemption does not include situations where such disturbance is part and parcel with any use requiring a Minor or Major Land Disturbance Activity Permit.

Wellhead Protection Areas

Prohibitions per Wellhead Protection Zone****:

- Zone I - No storm water storage volume attenuation of any type, whether for detention, retention, infiltration, recharge or water quality purposes regardless of watershed designation, i.e. High Quality (HQ), Exceptional Value (EV), Cold Water Fishery (CWF), etc.

- Zone II – Retention, infiltration and recharge facilities are specifically prohibited. Storm Water volume for surface detention and surface water quality facilities is permitted provided that a geological assessment is provided. The geological assessment shall certify specifically that ground water from such storm water attenuation facilities that are located in areas associated with Karst features will not contaminate the ground water within the wellhead protection area of wells No. 3, No. 5 and future well No. 8. In situations were such certification cannot be provided all required surface storage volume attenuation facilities whether for detention and/or water quality must be lined with impermeable liners.

- Zone III – Storm water storage volume attenuation of any type, whether for detention, retention, infiltration, recharge or water quality purposes is permitted provided that a geological assessment is provided. The geological assessment shall certify specifically that ground water from such storm water attenuation facilities that are located in areas associated with Karst features will not contaminate the ground water within the wellhead protection area of wells No. 3, No. 5 and future well No. 8. In situations were such certification cannot be provided no infiltration facility will be permitted and all required surface storage volume facilities whether for detention and/or water quality must be lined with impermeable liners.

**** Wellhead Protection Zones are as shown on the Drainage District mapping in Appendix 27.