Chapter 23

Stormwater Management and Soil, Erosion and Sedimentation Control

Part 1
General Provisions

Part 2
Definitions

Part 3
Soil, Erosion and Sedimentation Control

A. Soil Erosion and Sedimentation Control Measures Required for Land Development

B. Soil Erosion and Sedimentation Control Plan Requirements

Part 4
Stormwater Management

Part 1

General Provisions

§23-101. Statement of Findings.

The Borough Council of the Borough of Carroll Valley finds that:

A. Inadequate management of accelerated stormwater runoff resulting from development throughout a watershed increases flood flows, volume and velocities, thereby 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 stormwater, 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 stormwater management, including reasonable regulation of development and activities causing increased stormwater runoff volume and velocity as well as accelerated erosion, is fundamental to the public health, safety, welfare, and the protection of the people of the Borough and all the people of the Commonwealth, their resources, and the environment.

(*Ord. 6-03*, 7/15/2003, §101)

§23-102. Purpose.

The purpose of this Chapter is to promote health, safety, and welfare within the Borough by minimizing the damages described in §23-101.A of this Chapter through provisions designed to:

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

B. Utilize and preserve the existing natural surface and subsurface 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 Borough and the Commonwealth.

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

F. Provide proper maintenance of all permanent stormwater management facilities that are constructed in the Borough.

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

(*Ord. 6-03*, 7/15/2003, §102)

§23-103. Statutory Authority.

The Borough is empowered to regulate land use activities that affect runoff by the Authority of the Act of July 31, 1968, P.L. 805, No. 247, the Pennsylvania Municipali-

ties Planning Code, as amended by Act 170 of December 21, 1988 and Act 131 of December 14, 1992, 53 P.S. §10101 *et seq*., and the Borough Code, 53 P.S. §45101 *et seq*.

(*Ord. 6-03*, 7/15/2003, §103)

§23-104. Applicability.

This Chapter shall only apply to permanent stormwater management facilities constructed as part of any of the regulated activities listed in this Section. Local stormwater management design criteria (e.g., inlet spacing, inlet type, collection system design and details, outlet structure design, etc.) shall continue to be regulated by the applicable Borough ordinances or at the Borough Engineer's discretion. The following activities are defined as "regulated activities" and shall be regulated by this Chapter:

A. Land development.

B. Subdivision.

C. Construction of new or additional impervious or semi-pervious surfaces (driveways, parking lots, etc.).

D. Construction of new buildings or additions to existing buildings.

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

F. Installation of stormwater management facilities or appurtenances thereto.

(*Ord. 6-03*, 7/15/2003, §104)

§23-105. Compatibility with Other Ordinance Requirements.

Approvals issued pursuant to this Chapter do not relieve the applicant of the responsibility to comply with or to secure required permits or approvals for activities regulated by any other applicable code, rule, statute, or ordinance.

(*Ord. 6-03*, 7/15/2003, §107)

§23-106. Landowner Responsibility.

The granting of an exemption, permit, or approval by the Borough, does not relieve the applicant from assuring that stormwater runoff from the development site will not cause injury to other persons or property or the waters of the Commonwealth.

(*Ord. 6-03*, 7/15/2003, §108)

Part 2

Definitions

§23-201. Definitions.

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

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

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

C. The word "person" includes an individual, firm, association, organization, partnership, trust, company, corporation, or any other similar entity.

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

E. The words "used or occupied" include the words "intended, designed, maintained, or arranged to be used, occupied or maintained."

Accelerated erosion - the removal of the surface of the land through the combined action of human activity and the natural processes of a rate greater than would occur because of the natural process alone.

Agricultural activities - the work of producing crops and raising livestock including tillage, plowing, disking, harrowing, pasturing and installation of conservation measures. Construction of new buildings or impervious area is not considered an agricultural activity.

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

Applicant - a landowner or developer who has filed an application for approval to engage in any regulated activities as defined in §23-104 of this Chapter.

BMP (Best Management Practice) - stormwater management practice structures, facilities, systems and techniques to maintain or improve the water quality, runoff capture volume and/or peak discharge rate of surface runoff.

Buffer area -

(1) *Pervious Buffer Area*. Area surrounding impervious cover area that, because of its natural infiltration and retention characteristics can be used to manage stormwater runoff. Percent ratio of pervious area to impervious area must be a minimum of 30 percent to 70 percent for pervious area to be considered as a buffer.

(2) *Riparian Buffer*. Land corridor along stream channels that is

sufficiently vegetated and wide so as to treat water quality and retain stormwater runoff.

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

(4) *Channel Protection Runoff Volume*. Volume of stormwater that must be managed to protect a stream channel from erosion. The volume of runoff that creates a bankfull flow in a stream, usually associated with the 1.5-year design storm.

(5) *Cistern*. A reservoir or tank for storing rainwater, commonly underground.

(6) *Conservation BMPs*. Stormwater management practices that preserve the natural drainage, retention, and infiltration capacity of the land. Example: excluding riparian areas, woodlands and steep slopes from potential development area.

(7) *Conservation District*. The Adams County Conservation District. Culvert - A structure with appurtenant works, which carries a stream under or through an embankment or fill.

(8) *Cover Number (CN)*. Dimensionless number indicating pervious nature of a land cover as defined in TR-55, SCS, 1986.

(9) *Culvert*. A structure with appurtenant works, which carries a stream under or through an embankment or fill.

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

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

(12) *Designee*. The agent of the Borough involved with the administration, review or enforcement of any provisions of this Chapter by contract or memorandum of understanding.

(13) *Detention Basin*. An impoundment structure designed to manage stormwater runoff by temporarily storing the runoff and releasing it at a predetermined rate.

Design BMPs - stormwater management practices incorporated into a low impact development design that mimic natural drainage, retention, and infiltration capacity of the land. Example: disconnection of storm gutters, green roofs, minimal grading, and grubbing.

(1) *Mitigation BMPs*. Engineered bio-retention and structural stormwater management practices. Example: detention and retention ponds, infiltration trenches, swales.

Developer - a person, partnership, association, corporation, or other entity, or

any responsible person therein or agent thereof, that undertakes any regulated activity of this Chapter.

Development site - the specific tract of land for which a regulated activity is proposed.

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

Drainage conveyance facility - a stormwater management facility designed to transmit stormwater runoff and shall include streams, channels, swales, pipes, conduits, culverts, storm sewers, etc.

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

Drainage permit - a permit issued by the Borough after the drainage plan has been approved. Said permit is issued prior to or with the final Borough approval.

Drainage Plan - the documentation of the stormwater management system, if any, to be used for a given development site, the contents of which are established in Part 5.

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

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

Erosion and sediment pollution control plan - a plan, which is designed to minimize, accelerated erosion and sedimentation pursuant to 25 Pa.Code, Chapter 102.

Evapotranspiration - uptake (transpiration) by vegetation of moisture and evaporation from vegetation surfaces.

Existing conditions - the initial condition of a project 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 (CN) or Rational "C" value, such as forested lands.

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

Floodplain - any land area susceptible to inundation by water from any natural source or delineated by applicable Department of Housing and Urban Development, Federal Insurance Administration Flood Hazard Boundary - Mapped as being a special flood hazard area. Also included are areas that comprise Group 13 Soils, as listed in Appendix 23-A of the Pennsylvania Department of Environmental Protection (DEP) *Technical Manual for Sewage Enforcement Officers* (as amended or replaced from time to time by DEP).

Floodway - the channel of the watercourse and those portions of the adjoining floodplains that are reasonably required to carry and discharge the 100-year frequency flood. Unless otherwise specified, the boundary of the floodway is as

indicated on maps and flood insurance studies provided by FEMA. In an area where no FEMA maps or studies have defined the boundary of the 100-year frequency floodway, it is assumed, absent evidence to the contrary, that the floodway extends from the stream to 50 feet from the top of the bank of the stream.

Forest management/timber operations - planning and activities necessary for the management of forestland. These include timber inventory and preparation of forest management plans, silviculture treatment, cutting budgets, logging road design and construction, timber harvesting, site preparation and reforestation.

Freeboard - a vertical distance between the elevation of the design high water and the top of a dam, levee, tank, basin, or diversion ridge. The space is required as a safety margin in a pond or basin.

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

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

Groundwater recharge - replenishment of existing natural underground water supplies.

Impervious surface - a surface that prevents the percolation of water into the ground.

(1) *Connected impervious surface*. Impervious cover area with insufficient surrounding buffer area to naturally manage stormwater runoff - percent ratio of impervious to pervious area greater than 30 percent to 70 percent.

(2) *Unconnected Impervious Surface*. Impervious cover area with adequate surrounding buffer area to naturally manage stormwater runoff percent ratio of impervious to pervious area less than or equal to 30 percent to 70 percent.

(3) *Impoundment*. A retention or detention basin designed to retain stormwater runoff and release it at a controlled rate.

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. A structure at the diversion end of a conduit. The upstream end of any structure through which water may flow.

Land development - (1) the improvement of one lot or two or more contiguous lots, tracts, or parcels of land for any purpose involving (a) a group of two or more buildings, or (b) the division or allocation of land or space between or among two or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups, or other features; (2) any subdivision of land; (3) development in accordance with §503(1.1) of the Pennsylvania Borough Planning Code, 53 P.S. §10503 (1.1)..

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

Main stem (main channel) - any stream segment or other runoff conveyance facility used as a reach in the stream.

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.

Municipality - Borough of Carroll Valley, Adams County, Pennsylvania.

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

NRCS - Natural Resource Conservation Service (previously SCS).

Open channel - a drainage element in which stormwater 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 (for computational purposes).

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

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

Overland flow - stormwater runoff that flows as sheet or diffused flow and is not concentrated in a channel.

Parking lot storage - the use of impervious parking areas for temporary impoundment of stormwater with controlled release rates during rainstorms.

Peak discharge - the maximum rate of stormwater runoff from a specific storm event.

Penn State Runoff Model - a computer-based hydrologic modeling technique.

Pipe - a culvert, closed conduit, or similar structure (including appurtenances) that conveys stormwater.

Planning Commission - the Planning Commission of the Borough of Carroll Valley.

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

Rational formula - a rainfall-runoff relation used to estimate peak flow.

Regulated activities - actions or proposed actions that have an impact on stormwater runoff and that are specified in §23-104 of this Chapter.

Retention basin - an impoundment in which stormwater is stored and not released during the storm event. Stored water may be released from the basin at some time after the end of the storm.

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 25 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 stormwater 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.

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

Sediment pollution - the placement, discharge or introduction of sediment into the waters of the Commonwealth.

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

Seepage pit / seepage trench - an area of excavated earth filled with loose stone or similar coarse material, into which surface water is directed for infiltration into the ground.

Sheet / diffused flow - runoff that 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 NRCS that is based on relating soil type and land use/cover to a runoff parameter called curve number (CN).

Soil group, hydrologic - a classification of soils by the Soil Conservation Service into four runoff categories. 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 that is used to pass peak discharge greater than the maximum design storm controlled by the pond.

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

Storm frequency - the number of times that a given storm "event" occurs or is exceeded on the average in a stated period of years. See "return period."

Storm sewer - a system of pipes and/or open channels that convey intercepted runoff and stormwater from other sources, but excludes domestic sewage and industrial wastes.

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

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

Stormwater management site plan - the plan prepared by the developer or his representative indicating how stormwater runoff will be managed at the particular

site of interest in accordance with this Chapter.

Stream enclosure - a bridge, culvert, or other structure that encloses a regulated water of this Commonwealth.

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, transfer of ownership, or building or lot development: Provided, however, that the subdivision by lease of land for agricultural purposes into parcels of more than 10 acres, not involving any new street or easement of access or any residential dwellings, shall be exempt.

Swale - a low-lying stretch of land that gathers or carries surface water runoff.

Timber operations - see "forest management."

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

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

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

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

(*Ord. 6-03*, 7/15/2003, §201)

Part 3

Soli Erosion and Sedimentation Control

A. Soil Erosion and Sedimentation Control Measures Required for Land Development

§23-301. Earth Disturbance.

Any person conducting or proposing to conduct an earth disturbance activity in the Borough of Carroll Valley shall design implement and maintain BMPs to minimize the potential for accelerated erosion and sedimentation in order to protect, maintain, reclaim and restore water quality and existing and designated uses. The implementation of erosion and sediment control BMP s shall be the first step in any land disturbance and those BMPs shall be maintained in place until permanent stabilization is completed.

(*Ord. 6-03*, 7/15/2003, §300)

§23-302. Submission of Soil Erosion and Sedimentation Control Plan.

Prior to any earth disturbance greater than 5,000 square feet or any excavation in conjunction with land development, two copies of the soil erosion and sedimentation control plan approved by the Adams County Conservation District shall be submitted to the Borough of Carroll Valley.

Note: An approved Erosion and Sedimentation Control Plan is a requisite part of the drainage plan requirement for stormwater management.

(*Ord. 6-03*, 7/15/2003, §301)

§23-303. Soil Erosion and Sedimentation Control Requirements.

1. All soil erosion and sedimentation control and grading activities shall be performed in accordance with approved plans and in such a manner as not to cause physical damage or personal injury to existing property and/or adjoining property and owners.

2. Measures used to control soil erosion and reduce sedimentation shall as a minimum meet the latest revised standards, specifications and/or regulations of one or more of the following:

A. U.S. Department of Agriculture, *National Resource Conservation Service Engineering Field Manual*.

B. Commonwealth of Pennsylvania, Department of Environmental Protection, *Soil Erosion and Sedimentation Control Manual*.

C. *Standards and Specifications for Soil Erosion and Sediment Control in Developing Areas*, U.S. Department of Agriculture, Soil Conservation Service, College Park, Maryland.

3. Land disturbance activities for all land developments shall be conducted only in compliance with the following principles:

A. There shall be no increase in discharge of sediment or other solid materials

from the site as a result of stormwater runoff; and, any increase shall be deemed a violation of this Chapter.

B. Erosion and sedimentation control devices, as set forth in the DEP *Erosion and Sediment Pollution Control Program Manual*, appropriate to the scale of operations, shall be installed in accordance with the approved E&S plan. All perimeter controls shall be installed prior to earth moving operations of any type. The owner/developer shall contact Adams County Conservation District upon installation of control measures.

C. Earth moving operations shall be minimized where possible to preserve desirable natural features and topography of the site.

D. Stripping of vegetation, re-grading or other pre-development practices shall be done in such a way as to minimize soil erosion.

E. All tree removal shall comply with the Carroll Valley Borough Tree Ordinance [Chapter 25, Part 1]. Prior to removal of any trees, owner/developer shall obtain an approved permit and tree removal plan from the Borough's designated representative.

F. Land disturbance shall be limited to the actual construction site and an access strip that has been lined with gravel. The amount of disturbed area and the duration of exposure shall be kept to a minimum. Disturbed areas shall be stabilized with vegetation, mulch, erosion control fabric, and the like, as soon as possible after earthmoving procedures have commenced.

G. Temporary vegetation and/or mulching shall be used to protect critical areas during development. (Critical areas shall be construed to mean those portions of a site that are extremely vulnerable to soil erosion.)

H. The final, permanent, vegetation and structural soil erosion control and drainage measures shall be installed as soon as practical at the development site in accordance with the approved plans.

I. Soils and rock or geologic formations with water supply potential shall be protected from contamination by surface water or other sources of water distribution caused by construction activity.

(*Ord. 6-03*, 7/15/2003, §302)

§23-304. Control Requirements for Well Drilling.

For well drilling prior to lot development or receipt of a clearing and grading permit, it is imperative that site disturbance be kept to the minimum necessary. Prior to approval of the well permit the Code Enforcement Officer will meet with the owner or his agent at the proposed site to discuss site restraints and develop the most appropriate E&S plan for the well drilling site. In cases where due to terrain and well location greater that 5,000 square feet disturbance Is required to get in to drill the well a formal E&S plan shall be required. In no case shall the E&S requirements be less than measures below:

A. *Well Drilling Construction Sequence*. If the well is to be drilled within the area tributary to the proposed erosion controls and the controls are installed, no additional erosion controls will be required to drill the well.

(1) If the well is located outside the area tributary to the proposed erosion

controls or the erosion controls have not yet been installed the following sequence shall apply to all well drilling activities.

(2) The contractor shall install super silt fence parallel to the contour, down-slope from the well drilling activities.

(3) The contractor shall keep earth disturbances to the minimum required for the drilling equipment.

(4) The contractor shall drill the well.

(5) The contractor shall remove the super silt fence upon complete stabilization of the well drilling site. The super silt fence may be moved to another location of the site if possible.

(6) In situations where the actual well yields exceed anticipated flows by a considerable amount and the E&S measures are inadequate to handle the sediment pollution operations shall be suspended until appropriate controls are put in place.

(*Ord. 6-03*, 7/15/2003, §303)

§23-321. Preliminary Plan Requirements.

If a subdivision or land development plan is being prepared, preliminary plan requirements as set forth in §§23-402 through 23-404 of Carroll Valley Borough's current Subdivision and Land Development Ordinance [Chapter 22] must be addressed.

A. *Drafting Standards*:

(1) The plan shall be drawn at a scale of 1 inch = 20 feet.

(2) Plans shall be legible; half tone or screening shall be used as necessary.

(3) Bearings shall be in degrees, minutes and seconds and distances shall be in feet and decimal parts thereof.

(4) The boundary line of the lot shall be shown as a solid heavy line.

B. *Additional Information*. The plan shall depict, note, or be accompanied by the following information:

(1) Name of the subdivision or land development.

(2) Name and address of the owner of record and applicant.

(3) Name address and seal of the engineer or surveyor who prepared the plan.

(4) Zoning requirements, including:

(a) Applicable districts, including overlay districts.

(b) Allowable and proposed lot area and yard requirements.

(c) Allowable and proposed percentage of the lot(s) allowed to be covered by impervious surfaces and buildings.

(5) A location map highlighting the location of the parcel in the Borough and identifying abutting properties and adjoining roads within 1,000 feet. The location map shall be drawn at a scale not smaller than 1 inch = 800 feet.

(6) North arrow.

(7) Date of original drawing and any revisions.

(8) Written and graphic scales. Gross and net acreage of lots.

(9) Property lines.

(10) Contiguous boundaries of all adjoining properties, and names of owners of such properties.

(11) Existing streets on or adjacent to the site with existing and future rights-of-way, names and cart way widths.

(12) Locations of existing man-made features such as: buildings and their use, driveways, wells, storm drains, sewer lines, septic tanks, and other on-lot sewage disposal features, culverts, bridges, utility easements, utility poles, water lines and mains, fire hydrants and other significant man-made features within 100 feet of the lot (this includes properties across the street).

(13) Existing and proposed contours at 5-foot intervals for the lot and within 100 feet of the lot if the slope exceeds 10 percent. For grades of less than 10 percent, 2-foot contour intervals will be used. If the property contains land within the Flood Hazard District (in which case an actual field surveyed

topographical depiction would be required), then the requirements for a major subdivision and/or land development application shall apply and the application shall not be entitled to a review under this Part.

(14) Existing natural features including:

(a) Streams, ponds and springs.

(b) Soil types and descriptions.

(c) Tree masses and notable trees, indicating which are to be removed and which are to remain.

(d) Wetlands, including the name of the individual or firm who delineated the wetlands.

(15) Lot boundaries, lot layout and building setback lines.

(16) Lot area.

(17) Proposed driveway location(s).

(18) Any areas within the Flood Hazard District as depicted on the FEMA map for Carroll Valley Borough.

(19) Copies of the title report for the tract.

(20) Certification as to the accuracy and details of the plan shall be sealed by a professional engineer or registered surveyor.

(*Ord. 6-03*, 7/15/2003, §304)

§23-322. Final Plan Requirements.

If a subdivision or land development plan is being prepared, preliminary plan requirements as set forth in §23-406 of Carroll Valley Borough's current Subdivision and Land Development Ordinance [Chapter 22] must also be addressed.

A. All drafting standards and plan requirements, as set forth in the preliminary plan shall apply to the final plan as well as the following:

(1) A grading plan indicating proposed contour and final grades at 5 foot intervals and all proposed improvements to include all channels, swales, berms and other stormwater conveyances and storage facilities.

(2) Locations, of proposed buildings, well, septic and all utilities.

(3) Location of existing and proposed benchmark, permanent reference monuments and corner markers.

(4) When connection to public water and/or public sewer facilities is proposed, assurance of the availability of such services. This assurance shall be in the form of a letter signed by an officer of the company or authority concerned indicating their ability and willingness to make such service available.

(5) When the proposed lot involves a gas pipe line, petroleum products transmission line, electric power transmission line, or any other pipe line or cable located thereon, a letter from the owner or authorized agent of such a facility indicating minimum setback distance requirements or a true and correct copy of the easement or grant of record shall be filed.

(6) Location of wells and septic systems on adjoining lots.

(7) A planning module for land development shall be prepared and submitted to the Sewage Enforcement Officer as required by, 25 Pa.Code, Chapter 71, of the Pennsylvania Sewage Facilities Act

(8) A graphic depiction and list of all easements shall be shown on the plan and, if appearing on record, the book and page numbers.

(9) A development narrative that contains at a minimum the following information:

(a) Construction requirements.

(b) Construction sequence.

(c) General construction notes.

(d) Erosion control maintenance notes.

(e) Seeding and restoration table.

(*Ord. 6-03*, 7/15/2003, §305)

Part 4

Stormwater Management

§23-401. Exemptions.

1. Any regulated activity that meets the following exemption criteria is exempt from the provisions of §23-406, "Stormwater Peak Discharge Control Requirements," of this Chapter. These criteria shall apply to the total development even if development is to take place in phases. The date of adoption of this Chapter 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 and groundwater recharge, special requirements for high quality (HQ) and exceptional value (EV) watersheds, and of §§23-403.E, 23-404 and 23-405, respectively. Designated high quality and exceptional value stream zones are listed in Appendix 23-E to this Chapter.

STORMWATER MANAGEMENT PLANNING EXEMPTION CRITERIA

Impervious Area Exemption

Total Parcel Size	Exemption (sq. ft.)
<0.25 acre	1,000
0.25 to 0.5 acre	1,500
>0.5 to 1.25 acre	4,000
> 1.25 to 2 acres	10,000
> 2 to 5 acres	15,000
> 5 acres	20,000

(*Ord. 6-03*, 7/15/2003, §401)

§23-402. General Requirements.

1. All regulated activities in the Borough that do not fall under the exemption criteria shown in §23-401 shall submit a drainage plan consistent with this Chapter to the Borough for review. These criteria shall apply to the total proposed development 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 be gravel or crushed stone shall be assumed to be impervious for the purposes of comparison to the waiver criteria.

2. Stormwater drainage systems shall be provided in order to permit unimpeded flow along natural watercourses, except as modified by stormwater management facilities or open channels consistent with this Chapter.

3. The existing points of concentrated drainage that discharge onto adjacent property shall not be altered without permission of the adjacent property owner(s) and

shall be subject to any applicable discharge criteria specified in this Chapter.

4. Areas of existing diffused drainage discharge shall be subject to any applicable discharge criteria in the general direction of existing discharge, whether proposed to be concentrated or maintained as diffused drainage areas, except as otherwise provided by this Chapter. If diffused flow is proposed to be concentrated and discharged onto adjacent property, the developer must document that adequate downstream conveyance facilities exist to safely transport the concentrated discharge, or otherwise prove that no erosion, sedimentation, flooding or other harm will result from the concentrated discharge. New points of concentrated or diffused drainage onto adjacent property shall not be created without written permission of the adjacent property owner(s) and shall be subject to any applicable discharge criteria specified in this Chapter. Changes (increase or decrease) of diffuse discharge volume onto adjacent property is permitted only with the written permission of the adjacent property owner.

5. Where a development site is traversed by watercourses, drainage easements shall be provided conforming 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 adversely affect the flow of stormwater within any portion of the easement. Also, maintenance, including mowing of vegetation within the easement shall be required, except as approved by the appropriate governing authority.

6. 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 drainage ways. Work within natural drainage ways shall be subject to approval by DEP through the joint permit application process, or, where deemed appropriate by DEP, through the general permit process.

7. Any stormwater management facilities regulated by this Chapter that would be located in or adjacent to waters of the Commonwealth or wetlands shall be subject to approval by DEP, through the joint permit application process, or, where deemed appropriate by DEP, 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 DEP.

8. Any stormwater management facilities regulated by this Chapter that would be located on State highway rights-of-way shall be subject to approval by the Pennsylvania Department of Transportation (PennDOT).

9. Roof drains must not be connected to streets, sanitary or storm sewers or roadside ditches to promote overload flow and infiltration/percolation of stormwater where advantages to do so. When it is more advantageous to connect directly to streets or storm sewers, then it shall be permitted on a case-by-case basis by the Borough.

10. Any stormwater management facilities used to meet the standards of this Chapter must have all construction and/or maintenance requirements recorded so as to be discovered in a title search.

(*Ord. 6-03*, 7/15/2003, §402)

§23-403. General Stormwater Management Requirements.

The following general standards shall be applied to all development within the

Borough of Carroll Valley to control stormwater runoff:

A. All site development in the Borough shall submit a drainage plan consistent with the provisions of this Chapter to the Borough for review and approval. This requirement shall apply to the total proposed development even if the developments are to take place in stages. Impervious cover shall include, but not be limited to, any roof, parking or driveway area and any new street or sidewalk. any area initially designated to be gravel or crushed stone shall be assumed to be impervious.

B. To the maximum extent practical accepted best management practices as outlined in the adopted Act 167 Watershed Stormwater Management Plan(s) for the minimization of generating stormwater runoff, avoiding detrimental effects of stormwater runoff and the protection of environment (low impact development techniques) should be used.

C. Runoff from the site shall not be concentrated, or increased runoff discharged onto adjacent property without the written consent of the adjacent landowners in the form of a drainage easement.

D. All developments that create impervious surface or change the existing topography shall provide capacity for and treatment of the "Water Quality Volume" and "Groundwater Recharge Volume," as described under §§23-404 and 23-405.

E. Special requirements for areas falling within defined exceptional value and high quality sub-watersheds: the temperature and quality of water and streams that have been declared as exceptional value and high quality is to be maintained as defined in 25 Pa.Code, Chapter 93, "Water Quality Standards." Temperature sensitive BMP's and stormwater conveyance systems are to be used and designed with storage pool areas and supply outflow channels and should be shaded with trees. This will require modification of berm for permanent ponds and the relaxation of restrictions on planting vegetation within the facilities, provided that capacity for volumes and rate control is maintained at a minimum, the southern half on pond shorelines shall be planted with shade or canopy trees within 10 feet of the pond shoreline. In conjunction with this requirement, the maximum slope allowed on the berm area to be planted is 10 to 1. This will lessen the destabilization of berm soils due to root growth. a long term maintenance schedule and management plan for the thermal control BMP's is to be established and recorded for all development sites.

(*Ord. 6-03*, 7/15/2003, §403)

§23-404. Runoff Capture Volume Requirements (RCv).

1. The post-development runoff capture volume for a site shall equal or exceed the pre-development runoff capture volume for the site.

2. Compliance with the runoff capture volume requirement shall be demonstrated using the following procedure:

A. Calculate the pre-development runoff capture volume using the following equation.

$$P = \text{Runoff Capture Volume} = \frac{200}{CN} - 2 \quad \text{Equation 1}$$

Where: Q runoff (inches)

P = volume of rainfall captured (inches)

S = potential maximum retention after runoff begins (inches)

CN = predevelopment runoff curve number

An example of this calculation is provided in Example 1, located in Appendix 23-A of this Chapter.

B. Calculate the post-development runoff volume using the following procedure.

Step 1: Determine the Percentage of Each Land Use/Cover Type. In conventional site development, the designer would refer to. Table 2.2a in TR-55 (SCS, 1986) to select the CN that represents the proposed land use of the overall development (i.e., residential, commercial) without checking the overall percentages of impervious area, grass areas, semi-pervious areas, etc. Because the BMPs emphasize minimal site disturbance, reduce impervious surfaces below conventional amounts, and employ semi-pervious pavements, the CNs for these types of land uses/land covers are less than those for the conventional developments reflected in the CNs contained in Table 2.2a in TR-55. Therefore, it is appropriate to analyze the BMP site as discrete units to determine the CN that most accurately reflects actual conditions.

Step 2: Calculate the Composite BMP CN. The initial composite CN is calculated using a weighted approach based on individual land covers without considering the disconnectivity of the site impervious surfaces. This is done using the following Equation 2:

$$CN_c = \frac{CN1A1 + CN2A2\ldots + CN_jA_j}{A1 + A2\ldots + A_j} \quad \text{Equation 2}$$

Where: CN_c = composite curve number

A_j = area of each land cover

CN_j = curve number for each land cover

Overlays of SCS hydrologic soil group boundaries onto homogeneous land cover areas are used to develop the BMP CN. What is unique about this BMP custom-made CN technique is the way that this overlaid information is analyzed as small discrete units that represent the true hydrologic conditions, rather than the conventional TR-55 approach, that is based upon representative national averages that do not incorporate BMP techniques.

Step 3: Calculate the BMP CN Based on the Connectivity of Site Impervious Area

Disconnected impervious areas are impervious areas without any direct connection to a drainage system or other impervious surface. For example, roof drains from houses that are directed onto lawn areas where sheet flow occurs; instead of flowing onto a driveway that is drained into a curb, gutter, and storm sewer system that are

considered to be disconnected. Such direction of runoff from impervious to pervious surfaces increases the opportunity for infiltration. By increasing the ratio of disconnected impervious areas to pervious areas on the site, the CN and calculated resultant runoff can be reduced. When the total impervious area is less than 30 percent of the total area, the percentage of the unconnected impervious areas within the area influences the calculation of the CN. If the total impervious area is equal to or greater than 30 percent, no adjustment to the CN is warranted because the absorptive capacity of the remaining pervious surfaces will not significantly affect runoff (TR-55, SCS, 1986). The following Equation 3 is used to calculate the CN for areas with less than 30 percent impervious area.

$$CN_c = CN_p + \left(\frac{P_{imp}}{100}\right) \text{ x } (98 - CN_p) \text{ X } (1 = 0.5R) \quad \text{Equation 3}$$

Where: R = ratio of unconnected impervious area to total impervious area

CN_c = composite CN (adjusted for disconnected impervious areas)

CN_p = composite pervious CN

P_{imp} = percent of impervious site area

Example 1 in Appendix 23-A illustrates the use of steps 1 through 3 to calculate the runoff curve number using the BMP development technique outlined above for a hypothetical 1-acre residential lot designed to incorporate BMP techniques.

Step 3: Calculate the BMP Cn Based on the Connectivity of Site Impervious Area

Once the runoff CN has been calculated, the NRCS (formerly SCS) Runoff Curve Number Method (TR-55, SCS, 1989) can be used to estimate the runoff volume that will occur during the runoff capture design storm using Equation IV-3 and Equation IV-4. The design storm volume is the volume calculated for the site using Equation 1, presented previously).

$$S = \frac{1000}{CN} - 10 \quad \text{Equation 4}$$

Where: CN = post-development composite runoff curve number calculated as described above

$$Q = \frac{(P - 0.2S)}{(P + 0.8S)} \quad \text{Equation 5}$$

Where: Q = runoff (inches)

P = runoff capture rainfall volume (as calculated in Equation 1, presented previously)

S = potential maximum retention after runoff begins (inches)

If the runoff volume calculated in this manner is negligible, the runoff capture standard has been met. Otherwise, appropriate additional structural retention storage facilities must be used to provide the additional retention volume required to retain the excess

runoff volume. The calculations of the post-development runoff CN and resulting runoff volume during the runoff volume rain event are illustrated in Examples 2 and 3 contained in Appendix 23-A.

3. The following BMPs are effective in achieving compliance with the runoff capture volume requirement:

A. Minimization of disturbed areas.

B. Minimization of impervious surfaced areas.

C. Disconnection of impervious surfaces.

D. Use of permeable paving systems.

E. Use of infiltration trenches and pits.

F. Use of bioretention areas.

G. Use of cisterns and rain barrels.

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

5. The recharge facility shall be capable of completely infiltrating the impounded water within 48 hours.

6. The recharge facility shall be capable of completely infiltrating the impounded water within 48 hours.

7. A detailed soils evaluation of the project site shall be performed to determine the suitability of recharge facilities. The evaluation shall be performed by a qualified professional, and at a minimum, address soil permeability, depth to bedrock, susceptibility to sinkhole formation, and sub-grade stability. The general process for designing the infiltration BMP shall be:

A. Analyze hydrologic soil groups as well as natural and man-made features within watershed to determine general areas of suitability for infiltration practices.

B. Provide field test to determine appropriate percolation rate.

C. Design infiltration structures for required storm volume based on field-determined capacity at the level of the proposed infiltration surface.

D. Extreme caution shall be exercised where infiltration is proposed in geologically susceptible areas such as strip mine or limestone areas. Extreme caution shall also be exercised where salt or chloride would be a pollutant since soils do little to filter this pollutant and it may contaminate the groundwater. It is also extremely important that the design professional evaluate the possibility of groundwater contamination from the proposed infiltration/recharge facility and recommend a hydrogeologic justification study be performed if necessary. Whenever a basin will be located in an area underlain by limestone, a geological evaluation of the proposed location shall be conducted to determine susceptibility to sinkhole formations. The infiltration requirement in high quality/exceptional value waters shall be subject to DEP's 25 Pa.Code, Chapter 93, and anti-degradation regulations. The design of all facilities over limestone formations shall include measures to prevent ground water contamination and, where necessary, sinkhole formation. The Borough may require the installation of an impermeable liner in detention basins. The Borough may require a detailed hydrogeologic investigation.

E. The Borough may require the developer to provide safeguards against

groundwater contamination for uses that may cause groundwater contamination, should there be a mishap or spill. It shall be the developer's responsibility to verify if the site is underlain by limestone. The following note shall be attached to all drainage plans and signed and sealed by the developer's engineer/surveyor/ landscape/architect/geologist:

I, _____, certify that the proposed detention basin (circle one) is /is not underlain by limestone.

8. Where pervious pavement is permitted for parking lots, recreational facilities, nondedicated streets, or other areas, pavement construction specifications shall be noted on the plan.

9. Recharge/infiltration facilities may be used in conjunction with other innovative or traditional BMPs, stormwater control facilities, and nonstructural stormwater management alternatives.

10. In selecting the appropriate BMPs or combinations thereof, the land developer shall consider the following:

A. Permeability and infiltration rate of the site soils.

B. Slope and depth to bedrock.

C. Seasonal high water table.

D. Proximity to building foundations and wellheads.

E. Erosion Characteristics of the soil.

F. Land availability and topography.

The land developer shall submit original and innovative designs to the Borough Engineer for review and approval. Such designs may achieve the water quality objectives through a combination of BMP (best management practices).

(*Ord. 6-03*, 7/15/2003, §404)

§23-405. Water Quality Requirements.

1. Developed areas shall provide adequate storage and/or treatment facilities necessary to capture and treat stormwater runoff. All runoff produced by 2.3 inches of rainfall over a 24-hour period shall be captured and treated using acceptable BMP stormwater runoff water quality enhancement practices. The water quality volume should be calculated using the NRCS soil-cover complex based methodology as described under §23-404 using post-development conditions composite runoff curve numbers. In this manner, the benefits of BMP site development strategies will be reflected in reduced water quality volume requirements. The runoff capture volume computed under §23-304 may be a component of the water quality volume (WQv). If the runoff capture 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.

2. The following BMPs are effective in achieving compliance with the runoff capture volume requirement.

A. Stormwater ponds.

B. Stormwater wetlands.

C. Infiltration practices.

D. Filtering practices.

E. Open channel practices.

F. Nonstructural practices.

3. WQv shall be designed as part of a stormwater management facility, which incorporates water quality BMP's as a primary benefit of using that facility, in accordance with design specifications contained in the Monocacy River Watershed Stormwater Management Plan, the *Pennsylvania Handbook of Best Management Practices for Developing Areas*, and other references identified in the Monocacy River Watershed Stormwater Management Plan. The following factors should be considered when evaluating the suitability of BMPs used to control water quality at a given development site:

A. Peak discharge and required volume control.

B. Stream bank erosion.

C. Efficiency of the BMP's to mitigate water quality problems.

D. The volume of runoff that will be effectively treated.

E. The nature of the pollutant being removed.

F. Maintenance requirements.

G. Creation/protection of aquatic and wildlife habitat.

H. Recreational value.

I. Enhancement of aesthetic and property value.

4. If an extended detention or a permanent pool type facility is selected for the treatment of water quality volume, the outlet shall be designed such that 1-year 24-hour post-development runoff volume is released over a 24-hour period. This will also help channel protection. The release of water begins at the start of the storm (i.e., the invert of the water quality orifice is at the invert of the facility). The design of the facility shall consider and minimize the chances of clogging and sedimentation potential. Orifices smaller than 3 inches diameter are not recommended. However, if the design engineer can provide proof that the smaller orifices are protected from clogging by use of trash racks, etc., smaller orifices may be permitted.

(*Ord. 6-03*, 7/15/2003, §405)

§23-406. Stormwater Peak Discharge Rate Control Requirements.

1. Post-development peak discharge rates shall not exceed the pre-development discharge rates for the 2-, 5-, 10-, 25-, 50-, and 100-year, 24-hour design storms. If it is shown, that the peak rates of discharge indicated by the post-development hydrographs are less than or equal to the peaks of discharge, indicated by the pre-development hydrographs for 2-, 5-, 10-, 25-, 50-, and 100-year, 24-hour frequency design storms, then the requirements of this Section will be considered met. Otherwise, the developer shall provide such additional controls as, are necessary, to satisfy the peak rate of discharge requirement. The design storm volumes to be used in this analysis are provided below:

Return Period	24-Hour Rainfall Volume
2 years	2.8 inches
5 years	3.6 inches
10 years	4.5 inches
25 years	5.5 inches
50 years	6.8 inches
100 years	7.8 inches

2. Peak discharge rate should be calculated using the methods that utilize the NRCS soil-cover complex based methodology as described under §23-404 and should reflect the effects of proposed runoff capture and water quality enhancement measures upon peak discharge rates. In this manner, the benefits of BMP site development strategies used to achieve compliance with the runoff capture and water quality requirements will be properly reflected in the estimated post-development hydrographs.

3. The following BMPs are effective in achieving compliance with the peak rate of discharge limit requirement.

4. Stormwater ponds.

5. Stormwater wetlands.

6. Swales.

7. Runoff volume reduction BMPs.

(*Ord. 6-03*, 7/15/2003, §406)

§23-407. Design Criteria for Stormwater Management Facilities.

1. *General Criteria*.

A. Applicants may select runoff control techniques, or a combination of techniques, which are most suitable to control stormwater runoff from the development site. all controls shall be subject to approval of the Borough Engineer. The Borough Engineer may request specific information on design and/or operating features of the proposed stormwater controls in order to determine their suitability and adequacy in terms of the standards of this Section.

(1) The applicant should consider the effect of the proposed stormwater management techniques on any special soil conditions or geological hazards that may exist on the development site. In the event such conditions are identified on the site, the Borough Engineer may require in-depth studies by a competent geotechnical engineer. Not all stormwater control methods may be advisable or allowable at a particular development site.

(a) In developing a stormwater management plans for a particular site, stormwater controls shall be selected according to the following order of preference:

1) Infiltration of runoff on-site.

2) Flow attenuation by use of open vegetated swales and natural depressions.

3) Vegetative runoff treatment techniques.

4) Structural stormwater infiltration devices.

5) Stormwater detention/retention structures.

(2) Infiltration practices shall be used to the extent practicable to reduce volume increases and promote groundwater recharge. A combination of successive practices may be used to achieve the applicable minimum control requirements. Justification shall be provided by the applicant for rejecting each of the preferred practices based on actual site conditions.

(3) Open detention/retention facilities shall not be permitted within residential areas as part of an infill project.

(a) The applicant may request a waiver from this requirement. All such requests for waiver shall be submitted in writing.

(b) It shall be the responsibility of the applicant for a waiver of this part to show that the modification will not create a safety risk and that the modification is consistent with the best management practices and current engineering design standards.

2. Any stormwater management facility (i.e., detention basin) designed to store runoff and requiring a berm or earthen embankment required or regulated by this Chapter shall be designed to provide an emergency spillway to handle flow up to and including the 100-year post-development conditions. The height of embankment must be set as to provide a minimum 1.0 foot of freeboard above the maximum pool elevation computed when the facility functions for the 100-year post-development inflow. Should any stormwater management facility require a dam safety permit under 25 Pa.Code, Chapter 105, the facility shall be designed in accordance with Chapter 105 and meet the regulations of Chapter 105 concerning dam safety that may be required to pass storms larger than 100-year event.

3. Any facilities that constitute water obstructions (e.g., culverts, bridges, outfalls, or stream enclosures), and any work involving wetlands as directed in 25 Pa.Code, Chapter 105, regulations (as amended or replaced from time to time by DEP), shall be designed in accordance with Chapter 105 and will require a permit from DEP. Any other drainage conveyance facility that does not fall under Chapter 105 regulations must be able to convey, without damage to the drainage structure or roadway, runoff from the 25-year design storm with a minimum 1.0 foot of freeboard measured below the lowest point along the top of the roadway. Roadway crossings located within designated floodplain areas must be able to convey runoff from a 100-year design storm with a minimum 1.0-foot of freeboard measured below the lowest point along the top of roadway. Any facility that constitutes a dam as defined in 25 Pa.Code, Chapter 105, regulations may require a permit under dam safety regulations. Any facility located within a PennDOT right-of-way must meet PennDOT minimum design standards, and permit submission requirements.

4. Any drainage conveyance facility and/or channel that does not fall under 25 Pa.Code, Chapter 105, regulations, must be able to convey, without damage to the drainage structure or roadway, runoff from the 100-year design storm. Conveyance facilities to or exiting from stormwater management facilities (i.e., detention basins) shall be designed to convey the design flow to or from that structure. Roadway crossings located within designated floodplain areas must be able to convey runoff from a 25-year

design storm. any facility located within a PennDOT right-of-way must meet PennDOT minimum design standards and permit submission requirements.

5. Storm sewers must be able to convey post-development runoff from a 10-year design storm without surcharging inlets, where appropriate. A 25-year design storm is required where inlets are in a sump condition.

6. Adequate erosion protection shall be provided along all open channels, and at all points of discharge.

7. The design of all stormwater management facilities shall incorporate sound engineering principles and practices. The Borough shall reserve the right to disapprove any design that would result in the occupancy or continuation of an adverse hydrologic or hydraulic condition within the watershed.

(*Ord. 6-03*, 7/15/2003, §407)

§23-408. Calculation Methodology.

Stormwater runoff from all development sites shall be calculated using either the rational method or a soil-cover-complex methodology.

A. Any stormwater runoff calculations involving drainage areas greater than 200 acres, including on- and off-site areas, shall use generally accepted calculation technique that is based on the NRCS soil cover complex method. Table 23-1 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. The Borough Engineer may approve the use of the rational method to estimate peak discharges from drainage areas that contain less than 200 acres.

Table 23-1
Acceptable Computation Methods for Stormwater Management Plans

Method	Method Developed By	Applicability
TR-20 or commercial package based on TR-20	USDA-NRCS	When use of full model is desirable or necessary
TR-55 or Commercial Package Based on TR-55	USDA-NRCS	Applicable for plans within the models limitations
HEC-1	U.S. Army Corps of Engineers	When full model is desirable or necessary
PSRM	Penn State University	When full model is desirable or necessary
Rational Method or commercial package based on Rational Method	Emil Kuiching (1889)	For site less than 200 acres with the approval of the Borough engineer
Other Methods	Various	As approved by the Borough Engineer

B. All calculations consistent with this Chapter using the soil cover complex method shall use the appropriate design rainfall depths for the various return

period storms presented shall be obtained from the Pennsylvania Department of Transportation publication, *Design Manual*, Part 2, "Highway Design Publication 13M," current edition. Calculations shall utilize a 24-hour rainfall duration and the NRCS Type II rainfall distribution.

C. For the purposes of predevelopment flow rate determination, undeveloped land shall be considered as "meadow" good condition, unless the natural ground cover generates a lower curve number or rational 'C' value (i.e., forest).

D. All conveyance piping calculations performed using the rational method shall use rainfall intensities consistent with appropriate times of concentration for overland flow and return periods from the Design Storm Curves from shall be obtained from the Pennsylvania Department of Transportation publication *Design Manual*, Part 2, "Highway Design Publication 13M," current edition. Times of concentration for overland flow shall be calculated using the methodology presented in Chapter 3 of *Urban Hydrology for Small Watersheds*, NRCS, TR-55 (as amended or replaced from time to time by NRCS). Times of concentration for channel and pipe flow shall be computed using Manning's equation.

E. Runoff curve numbers (CN) for both existing and proposed conditions to be used in the soil cover complex method shall be obtained from the publication *Urban Hydrology for Small Watersheds*, NRCS, TR-55, current edition.

F. Runoff coefficient (c) for both existing and proposed conditions for use in the rational method shall be obtained from the Pennsylvania Department of Transportation publication, *Design Manual*, Part 2. "Highway Design Publication 13M," current edition.

G. Where uniform flow is anticipated, the Manning equation shall be used for hydraulic computations, and to determine the capacity of open channels, pipes, and storm sewers. Values for Manning's roughness coefficient (n) shall be consistent with shall be obtained from the Pennsylvania Department of Transportation publication, *Design Manual*, Part 2, "Highway Design Publication 13M," current edition.

H. Outlet structures for stormwater management facilities shall be designed to meet the performance standards of this Chapter using any generally accepted hydraulic analysis technique or method.

I. The design of any stormwater detention facilities intended to meet the performance standards of this Chapter shall be verified by routing the design storm hydrograph through these facilities using the storage-indication method. For drainage areas greater than 20 acres in size, the design storm hydrograph shall be computed using a calculation method that produces a full hydrograph. The Borough may approve the use of any generally accepted full hydrograph approximation technique, which shall use a total runoff volume that is consistent with the volume from a method that produces a full hydrograph.

J. The Borough has the authority to require that computed existing runoff rates be reconciled with field observations and conditions. If the designer can substantiate through actual physical calibration that more appropriate runoff and time-of concentration values should be utilized at a particular site, then appropriate variations may be made upon review and recommendations of the Borough Engineer. Calibration shall require detailed gauge and rainfall data for the

particular site in question.

(*Ord. 6-03*, 7/15/2003, §408)

§23-409. Erosion and Sedimentation Requirements for Infiltration BMPs.

Additional erosion and sedimentation control design standards and criteria that must be, or are recommended to be applied where infiltration BMPs are proposed include the following:

A. Areas proposed for infiltration BMPs shall be protected from sedimentation and compaction during the construction phase, so as to maintain their maximum infiltration capacity.

B. Infiltration BMPs shall not be constructed nor receive runoff until the entire contributory drainage area to the infiltration BMP has received final stabilization.

(*Ord. 6-03*, 7/15/2003, §409)

Part 5

Drainage Plan Requirements

§23-501. General Requirements.

1. For any of the activities regulated by this Chapter, the final approval of subdivision and/or land development plans, the issuance of any building or occupancy permit, or the commencement of any land disturbance activity may not proceed until the property owner or developer or his/her agent has received written approval of a drainage plan from the Borough.

2. The following items shall be included in the drainage plan:

A. *General*.

(1) General description of project.

(2) General description of permanent stormwater management techniques, including conservation and design BMPs and construction specifications of the materials to be used for stormwater management facilities.

(3) Complete hydrologic, hydraulic, and structural computations for all stormwater management facilities.

(4) Maintenance specifications and schedule.

B. Map(s) of the project area shall be submitted on 18-inch x 24-inch, 24-inch x 36-inch or 30-inch x 42-inch sheets and shall be prepared in a form that meets the requirements for recording in the offices of the Recorder of Deeds of Adams County. The contents of the maps(s) shall include, but not be limited to:

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

(2) Existing contours at intervals of 2-feet. In areas of steep slopes (greater than 15 percent), 5-foot contour intervals may be used.

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

(4) Other physical features including flood hazard boundaries, sinkholes, streams, existing drainage courses, areas of natural vegetation to be preserved, and the total extent of the upstream area draining through the site.

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

(6) An overlay showing soil names and boundaries.

(7) Proposed changes to the land surface and vegetative cover, including the type and amount of impervious area that would be added.

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

(9) Final contours at intervals at two feet. In areas of steep slopes (greater than 15 percent), 5-foot contour intervals may be used.

(10) The name of the development, the name and address of the owner of the property, and the name of the individual or firm preparing the plan.

(11) The date of submission.

(12) A graphic and written scale of 1 inch equals no more than 50 feet; for tracts of 20 acres or more, the scale shall be 1 inch equals no more than 100 feet.

(13) A north arrow.

(14) The total tract boundary and size with distances marked to the nearest foot and bearings to the nearest degree.

(15) Existing and proposed land use(s).

(16) A key map showing all existing man-made features beyond the property boundary that would be affected by the project.

(17) Horizontal and vertical profiles of all open channels, including hydraulic capacity.

(18) Overland drainage paths.

(19) A 20-foot wide access easement around all stormwater management facilities that would provide ingress to and egress from a public right-of-way.

(20) A note on the plan indicating the location and responsibility for maintenance of stormwater management facilities that would be located off-site. all off-site facilities shall meet the performance standards and design criteria specified in this Chapter.

(21) A construction detail of any improvements made to sinkholes and the location of all notes to be posted, as specified in this Chapter.

(22) A statement, signed by the landowner, acknowledging the stormwater management system to be a permanent fixture that can be altered or removed only after approval of a revised plan by the Borough.

(23) The following signature block for the Borough Engineer.

_____; on this date (date of signature), has reviewed and hereby certifies that the drainage plan meets all design standards and criteria of the Borough Ordinance."

(24) The location of all erosion and sedimentation control facilities.

(25) Notes on the plan indicating ownership and maintenance responsibility for stormwater management practices, facilities, and systems in accordance with §23-802 of this Chapter and acknowledging the stormwater management practices, facilities, and systems to be permanent fixtures that can be altered or removed only after approval of a revised plan by the Borough.

3. *Supplemental Information*.

A. A written description of the following information shall be submitted.

(1) The overall stormwater management concept for the project.

(2) Stormwater runoff computations as specified in this Chapter.

(3) Stormwater management techniques to be applied both during and after development.

(4) Expected project time schedule.

B. A soil erosion and sedimentation control plan, where applicable, including

all reviews and approvals, as required by DEP.

C. A geologic assessment of the effects of runoff on sinkholes as specified in this Chapter.

D. The effect of the project (in terms of runoff volumes and peak flows) on adjacent properties and on any existing municipal stormwater collection system that may receive runoff from the project site. (not required if exempted from §23-406 peak discharge requirements)

E. A Declaration of adequacy and highway occupancy permit from the PennDOT District Office when utilization of a PennDOT storm drainage system is proposed.

4. *Stormwater Management Facilities*.

A. All stormwater management facilities must be located on a plan and described in detail.

B. When groundwater recharge methods such as seepage pits, beds or trenches are used, the locations of existing and proposed septic tank infiltration areas and wells must be shown.

C. All calculations, assumptions, and criteria used in the design of the stormwater management facilities must be shown.

(*Ord. 6-03*, 7/15/2003, §501)

§23-502. Drainage Plan Contents.

The drainage 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 drainage plan materials shall be submitted to the Borough in a format that is clear, concise, legible, neat, and well organized; otherwise, the drainage plan shall be disapproved and returned to the applicant.

(*Ord. 6-03*, 7/15/2003, §502)

§23-503. Plan Submission.

For all activities regulated by this Chapter, the steps below shall be followed for submission. For any activities that require a DEP joint permit application and regulated under 25 Pa.Code, Chapter 105, (Dam Safety and Waterway Management) or Chapter 106 (Floodplain Management), require a PennDOT highway occupancy permit, or require any other permit under applicable State or Federal regulations, the permit(s) shall be part of the plan.

A. The drainage plan shall be submitted by the developer as part of the preliminary plan submission for the regulated activity.

B. Four copies of the drainage plan shall be submitted.

C. Distribution of the drainage plan will be as follows:

(1) Two copies to the Borough accompanied by the requisite municipal review fee, as specified in this Chapter.

(2) One copy to the Borough Engineer.

(3) One copy to the County Planning Commission/Office.

(*Ord. 6-03*, 7/15/2003, §503)

§23-504. Drainage Plan Review.

1. The Borough Engineer shall review the drainage plan for consistency with this Chapter. The Borough shall require receipt of a complete plan, as specified in this Chapter.

2. The Borough Engineer shall review the drainage plan for any submission or land development against the Borough Subdivision and Land Development Ordinance provisions [Chapter 22] not superseded by this Chapter.

3. For activities regulated by this Chapter, the Borough Engineer shall notify the Borough in writing, within 40 calendar days, whether the drainage plan is consistent with this Chapter. Should the drainage plan be determined to be consistent with this Chapter, the Borough Engineer will forward an approval letter to the developer with a copy to the Borough Secretary.

4. Should the drainage plan be determined to be inconsistent with this Chapter, the Borough Engineer will forward a disapproval letter to the developer with a copy to the Borough Secretary citing the reason(s) for the disapproval. Any disapproved drainage plans may be revised by the developer and resubmitted consistent with this Chapter.

5. For regulated activities specified in §23-104 of this Chapter, the Borough Engineer shall notify the Borough Building Permit Officer in writing, within a time frame consistent with the Borough Building Code [Chapter 5] and/or Borough Subdivision Ordinance [Chapter 22], whether the drainage plan is consistent with this Chapter and forward a copy of the approval/disapproval letter to the developer. Any disapproved drainage plan may be revised by the developer and resubmitted consistent with this Chapter.

6. For regulated activities requiring a DEP joint permit application, the Borough Engineer shall notify DEP whether the drainage plan is consistent with this Chapter and forward a copy of the review letter to the Borough and the developer. DEP may consider the Borough Engineer's review comments in determining whether to issue a permit.

7. The Borough shall not approve any subdivision or land development for regulated activities specified in §23-104 of this Chapter if the drainage plan has been found to be inconsistent with this Chapter, as determined by the Borough Engineer. all required permits from DEP must be obtained prior to approval.

8. The Borough Building Permit Office shall not issue a building permit for any regulated activity specified in §23-104 of this Chapter if the drainage plan has been found to be inconsistent with this Chapter, as determined by the Borough Engineer, or without considering the comments of the Borough Engineer. all required permits from DEP must be obtained prior to issuance of a building permit.

9. The developer shall be responsible for completing an as-built survey of all stormwater management facilities included in the approved drainage plan. The as-built survey and an explanation of any discrepancies with the design plans shall be

submitted to the Borough Engineer for final approval. In no case shall the Borough approve the as-built survey until the Borough receives a copy of an approved declaration of adequacy, highway occupancy permit from the PennDOT District Office, and any applicable permits from DEP.

10. The Borough's approval of a drainage plan shall be valid for a period not to exceed 2 years. This 2-year time period shall commence on the date that the Borough signs the approved drainage plan. If stormwater management facilities included in the approved drainage plan have not been constructed, or if an as-built survey of these facilities has not been approved within this 2-year time period, then the Borough may consider the drainage plan disapproved and may revoke any and all permits. drainage plans that are considered disapproved by the Borough shall be resubmitted in accordance with §23-507 of this Chapter.

(*Ord. 6-03*, 7/15/2003, §504)

§23-505. Modification of Plans.

A modification to a submitted drainage plan for a development site that involves a change in stormwater management facilities or techniques, or that involves the relocation or re-design of stormwater management facilities, or that is necessary because soil or other conditions are not as stated on the drainage plan as determined by the Borough Engineer, shall require a resubmission of the modified drainage plan consistent with §23-504 of this Chapter and be subject to review as specified in §23-505 of this Chapter. A modification to an already approved or disapproved drainage plan shall be submitted to the Borough, accompanied by the applicable review fee. A modification to a drainage plan for which the Borough has not taken a formal action shall be submitted to the Borough, accompanied by the applicable Borough review fee.

(*Ord. 6-03*, 7/15/2003, §505)

§23-506. Resubmission of Disapproved Drainage Plans.

A disapproved drainage plan may be resubmitted, with the revisions addressing the Borough Engineer's concerns documented in writing, to the Borough Engineer in accordance with §23-504 of this Chapter and be subject to review as specified in §23-505 of this Chapter. The applicable Borough review fee must accompany a resubmission of a disapproved drainage plan.

(*Ord. 6-03*, 7/15/2003, §506)

Part 6

Inspections

§23-601. Schedule of Inspections.

1. The Borough Engineer or the Borough assignee shall inspect all phases of the installation of the permanent stormwater management facilities.

2. During any stage of the work, if the Borough Engineer determines that the permanent stormwater management facilities are not being installed in accordance with this Chapter, the Borough shall revoke any existing permits until a revised drainage plan is submitted and approved, as specified in this Chapter.

(*Ord. 6-03*, 7/15/2003, §601)

Part 7

Fees and Expenses

§23-701. General.

A Borough review fee shall be established by the Borough to defray review costs incurred by the Borough and the Borough Engineer. The applicant shall pay all fees.

(*Ord. 6-03*, 7/15/2003, §701)

§23-702. Municipality Drainage Plan Review Fee.

The Borough shall establish a review fee schedule by resolution of the Borough Council based on the size of the regulated activity and based on the Borough's costs for reviewing drainage plans. The Borough shall periodically update the review fee schedule to ensure that review costs are adequately reimbursed.

(*Ord. 6-03*, 7/15/2003, §702)

§23-703. Expenses Covered by Fees.

The fees required by this Chapter shall, at a minimum, cover:

A. Administrative/clerical costs.

B. The review of the drainage plan by the Borough and the Borough Engineer.

C. The review of erosion and sedimentation plans by the Conservation District.

D. The site inspections including, but not limited to, pre-construction meetings, inspections during construction of stormwater facilities and appurtenances, and final inspection upon completion of the stormwater facilities and drainage improvements.

E. Any additional work required to enforce any permit provisions regulated by this Chapter, correct violations, and assure proper completion of stipulated remedial actions.

(*Ord. 6-03*, 7/15/2003, §703)

Part 8

Maintenance Responsibilities

§23-801. Performance Guarantee.

The applicant shall provide a financial guarantee to the Borough for the timely installation and proper construction of all stormwater management controls as required by this Chapter equal to the full construction cost of the required controls.

(*Ord. 6-03*, 7/15/2003, §801)

§23-802. Maintenance Responsibilities.

1. The drainage plan for the development site shall contain an operation and maintenance plan prepared by the developer and approved by the Borough Engineer. The operation and maintenance plan shall outline required routine maintenance actions and schedules necessary to insure proper operation of the facility(ies).

2. The drainage plan for the development site shall establish responsibilities for the continuing operating and maintenance of all proposed stormwater control facilities, consistent with the following principals.

3. If a development consists of structures or lots which are to be separately owned and in which streets, sewers and other public improvements are to be dedicated to the Borough, stormwater control facilities may also be dedicated to and maintained by the Borough.

4. If a development site is to be maintained in a single ownership or if sewers and other public improvements are to be privately owned and maintained, then the ownership and maintenance of stormwater control facilities shall be the responsibility of the owner or private management entity. If stormwater management facilities are privately owned, all operation and maintenance specifications and schedules.

5. The Borough Council, upon recommendation of the Borough engineer, shall make the final determination on the continuing maintenance responsibilities prior to final approval of the drainage plan. The Borough Council reserves the right to accept the ownership and operating responsibility for any or all of the stormwater management controls.

(*Ord. 6-03*, 7/15/2003, §802)

§23-803. Maintenance Agreement for Privately Owned Stormwater Facilities.

1. Prior to final approval of the site's stormwater management plan, the property owner shall sign and record a maintenance agreement covering all stormwater control facilities that are to be privately owned. Said agreement, designated as Appendix 23-C, is attached and made part hereto.

2. Other items may be included in the agreement where determined necessary to guarantee the satisfactory maintenance of all facilities. The maintenance agreement shall be subject to the review and approval of the Borough Solicitor and Borough Council.

3. The maintenance agreement shall be recorded upon the land records of Adams County and upon the approved subdivision plan.

(*Ord. 6-03*, 7/15/2003, §803)

§23-804. Municipal Stormwater Maintenance Fund.

1. If stormwater facilities are accepted by the Borough for dedication, persons installing stormwater storage facilities shall be required to pay a specified amount to the Borough stormwater maintenance fund to help defray costs of periodic inspections and maintenance expenses. The amount of the deposit shall be determined as follows:

A. If the storage facility is to be owned and maintained by the Borough, the deposit shall cover the estimated costs for maintenance and inspections for 10 years. The Borough Engineer will establish the estimated costs utilizing information submitted by the applicant.

B. The amount of the deposit to the fund shall be converted to present worth of the annual series values. The Borough Engineer shall determine the present worth equivalents, which shall be subject to the approval of the Borough Council.

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

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

(*Ord. 6-03*, 7/15/2003, §804)

§23-805. Post-Construction Maintenance Inspections.

1. Basins should be inspected by the land owner/developer or responsible entity (including the Borough Engineer for dedicated facilities) on the following basis:

A. Annually for the first 5 years.

B. Once every 3 years thereafter.

C. During or immediately after the cessation of a 100-year or greater storm event.

2. The entity conducting the inspection should be required to submit a report to the Borough regarding the condition of the facility and recommending necessary repairs, if needed.

(*Ord. 6-03*, 7/15/2003, §805)

Part 9

Enforcement and Penalties

§23-901. Right-of-Entry.

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

(*Ord. 6-03*, 7/15/2003, §901)

§23-902. Notification.

In the event that a person fails to comply with the requirements of this Chapter, or fails to conform to the requirements of any permit issued hereunder, the Borough shall provide written notification of the violation. Such notification shall set forth the nature of the violation(s) and establish a time limit for correction of these violations(s). Failure to comply within the time specified shall subject such person to the penalty provision of this Chapter. All such penalties shall be deemed cumulative and shall not prevent the Borough from pursuing any and all other remedies. It shall be the responsibility of the owner of the real property on which any regulated activity is proposed to occur, is occurring, or has occurred, to comply with the terms and conditions of this Chapter.

(*Ord. 6-03*, 7/15/2003, §902)

§23-903. Enforcement.

The Borough Council is hereby authorized and directed to enforce all of the provisions of this Chapter. All inspections regarding compliance with the drainage plan shall be the responsibility of the Borough Engineer or other qualified persons designated by the Borough.

A. A set of design plans approved by the Borough shall be on file at the site throughout the duration of the construction activity. The Borough or designee may make periodic inspections throughout the construction process.

B. *Adherence to Approved Plan*. It shall be unlawful for any person, firm or corporation to undertake any regulated activity under §23-104 on any property except as provided for in the approved drainage plan and pursuant to the requirements of this Chapter. It shall be unlawful to alter or remove any control structure required by the drainage plan pursuant to this Chapter or to allow the property to remain in a condition that does not conform to the approved drainage plan.

C. At the completion of the project, and as a prerequisite for the release of the performance guarantee, the owner or his representatives shall:

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

revisions thereto.

(2) Provide a set of as-built drawings.

D. After the receipt of the certification by the Borough, a final inspection shall be conducted by the Borough Council or its designee to certify compliance with this Chapter.

E. *Suspension and Revocation of Permits*.

(1) Any permit issued under this Chapter may be suspended or revoked by the Borough Council for:

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

b) A violation of any provision of this Chapter or any other applicable law, ordinance, rule or regulation relating to the project.

c) The creation of any condition or the commission of any act during construction or development which constitutes or creates a hazard or nuisance, pollution or which endangers the life or property of others, or as outlined in Part 9 of this Chapter.

(2) A suspended permit shall be reinstated by the Borough Council when:

a) The Borough Engineer or his designee has inspected and approved the corrections to the stormwater management and erosion and sediment pollution control measure(s), or the elimination of the hazard or nuisance.

b) The Borough Council is satisfied that the violation of this Chapter, law, or rule and regulation has been corrected.

c) A permit, which has been revoked by the Borough Council, cannot be reinstated. The applicant may apply for a new permit under the procedures outlined in this Chapter.

F. *Occupancy Permit*. An occupancy permit shall not be issued unless the certification of compliance has been secured. The occupancy permit shall be required for each lot owner and/or developer for all subdivisions and land development in the Borough.

(*Ord. 6-03*, 7/15/2003, §903)

§23-904. Public Nuisance.

1. The violation of any provision of this Chapter is hereby deemed a public nuisance.

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

(*Ord. 6-03*, 7/15/2003, §904)

§23-905. Penalties.

1. Upon conviction thereof, shall be sentenced to a fine of not more than $1,000 plus costs and, in default of payment of said fine and costs, to a term of imprisonment not to exceed 30 days. Each day that a violation of this Part continues or each Section of this Part which shall be found to have been violated shall constitute a separate

offense. [A.O.]

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

(*Ord. 6-03*, 7/15/2003, §905; as amended by A.O.

§23-906. Appeals.

1. Any person aggrieved by any action of the Borough or its designee, relevant the provisions of this Chapter may appeal to the Borough Zoning Hearing Board within 30 days of that action.

2. Any person aggrieved by any decision of Zoning Hearing Board, relevant to the provisions of this Chapter, may appeal to the County Court of Common Pleas in the County where the activity has taken place within 30 days of the Zoning Hearing Board's decision.

(*Ord. 6-03*, 7/15/2003, §906)

ORDINANCE APPENDIX 23-A

EXAMPLE VOLUME CONTROL STANDARD CALCULATIONS

Example 1
Example Calculation of Runoff Capture Volume Requirement

Given:

BMP CN: CN for individual land covers based on Table 2.2a (TR-55, SCS, 1986).
Hydrologic Soil Group = B

Procedure:

Step 1: For the pre-development condition, determine percentage of each land cover occurring on the site and the CN associated with each land cover.

Land Cover	HSG	CN	% of Site	Land Coverage (ft^2)
Open space (good condition)	B	61	55	32,670
Woods (fair condition)	B	55	45	10,890

Step 2: Calculate the pre-development composite CN using a weighted average technique.

$$CN = \frac{61*32{,}670+55*10{,}890}{32{,}370+10{,}890}$$

$$CN = 59.5$$

Step 3: Calculate the required runoff capture volume.

$$P = \text{Runoff Capture Volume} = \frac{200}{CN} - 2$$

$$P = \text{Runoff Capture Volume} = \frac{200}{59.5} - 2$$

$$P = \text{Runoff Capture Volume} = 1.36 \text{ inches}$$

For this hypothetical site, 1.36 inches of rainfall must be retained/infiltrated on the site.

Example 2

BMP CN Calculation

Given:

BMP CN: CN for individual land covers based on Table 2.2a (TR-55, SCS, 1986).
Hydrologic Soil Group = B

Procedure:

Step 1: Determine percentage of each land cover occurring on the site and the CN associated with each land cover.

Land Cover	HSG	CN	% of Site	Land Coverage (ft^2)
Impervious (directly connected)	B	98	5	2,178
Impervious (unconnected)	B	98	10	4,356
Pervious pavement	B	70	5	2,000
Open space (good condition)	B	61	55	24,136
Woods (fair condition)	B	55	25	10,890

Step 2: Calculate the composite custom CN.

$$CN_c = \frac{CN_1 A_1 + CN_2 A_2 \ldots + CN_i A_i}{A_1 + A_2 \ldots + A_i}$$

$$CN_c = \frac{98x2,178+98*4,356+71*2,000+61*24,136+55*10,890}{2,178+4,356+2,000+24,136+10,890}$$

$CN_c = 65.4$

Step 2: Calculate the BMP development CN based on the connectivity of site imperviousness.

$$CN_p = \frac{70*2.000+61*24.136+55*10.890}{2.000+24.136+10.890}$$

$CN_p = 59.7$

$$R = \frac{10}{15}$$

$R = 0.67$

$$CN_c = CN_p + \left(\frac{P_{imp}}{100}\right) X (98 - CN_p) X (1 - 0.5R)$$

$$CN_c = 59.7 + \left(\frac{15}{100}\right) X (98 - 59.7) X (1 - 0.5 X 0.67)$$

$CN_c = 63.5$

Example 3

Runoff Volume Calculation

Given: Runoff Control Volume Requirement (Example 1) = 1.38 inches.
Post development composite runoff curve number =63.5 (Example 2)
Development area = 43,560 square feet (Example 3)

$$S = \frac{1000}{CN} - 10 \qquad Q_{(inches)} = \frac{(P - 0.2S)^2}{(P + 0.8S)}$$

$$S = \frac{1000}{63.5} - 10 \qquad Q_{(inches)} = \frac{(1.36 - 0.2 \times 5.7)^2}{(1.36 + 0.8 \times 5.7)}$$

$$S = 5.7 \qquad Q_{(inches)} = 0.01 \text{ inches}$$

$$Q_{(cubic\ feet)} = Q_{(inches)} \times \frac{1\ foot}{12\ inches} \times Area$$

$$Q_{(cubic\ feet)} = 0.01 \times \frac{1\ foot}{12\ inches} \times 43{,}560\ square\ feet$$

$$Q_{(cubic\ feet)} = 36\ cubic\ feet$$

P = Required Runoff Control Precipitation Volume
For this hypothetical case, P = 1.36 inches (Example 1)
CN = post-development runoff curve number
For this hypothetical case, CN = 63.5 (Example 2)
Area = Development site area (square feet)
For this hypothetical case, Area = 43, 560 (Example 2)
Q = "excess" runoff volume to be controlled by supplementary runoff volume control BMPs

Therefore: Approximately 36 cubic feet of runoff volume must be controlled using supplemental structural runoff volume control BMPs.

ORDINANCE APPENDIX 23-B

SAMPLE

DRAINAGE PLAN APPLICATION

DRAINAGE PLAN APPLICATION

Application is hereby made for review of the stormwater management and erosion and sedimentation control plan and related data as submitted herewith in accordance with The _____ Stormwater Management and Earth Disturbance Ordinance.

_____ final plan _____ preliminary plan _____sketch plan _____

Date of submission _____ submission no.

1. Name of subdivision or development _____

2. Name of applicant _____ telephone no. _____
(if corporation, list the corporation's name and the names of two officers of the corporation)

Address _____
_____ zip

Applicants interest in subdivision or development _____
(if other than property owner give owners name and address)

3. Name of property owner _____ telephone no. _____
Address _____
_____ zip

4. Name of engineer or surveyor _____ telephone no._____
Address _____
_____ zip

5. Type of subdivision or development proposed:

___ single-family lots (multi-lot)	___ townhouses	___ commercial
___ two family lots (one-lot)	___ garden apartments	___ commercial
___ multi-family (multi-lot)	___ mobile-home park	___ industrial
___ cluster type lots (one-lot)	___ campground	___ industrial
___ planned residential (_____)	___ other development	

6. Lineal feet of new road proposed? _____

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

a. Existing (to remain) _____ s.f. _____ % of property
b. Proposed _____ s.f. _____ % of property

8. Stormwater

a. Describe the proposed runoff control measures (use additional sheets).

b. Does this plan meet the requirements of Part 3 of the Stormwater Ordinance? _____

- if not, what variances/waivers are requested?
_____
_____
- reasons for requesting the variances/waivers _____
_____

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

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

e. Is a construction schedule or staging attached? _____

f. Is a recommended maintenance program attached? _____

9. Erosion and sediment pollution control (E&S)

a. Has the stormwater management and E&S plan, supporting documentation and narrative been submitted to the _____ County Conservation District? _____

b. Total area of earth disturbance _____ s.f.

12. Filing

a. Has the required fee been submitted? _____ Amount submitted _____

b. Has -the proposed schedule of construction inspection to be performed by the applicant's engineer been submitted? _____

c. Name of individual whom will be making the inspections
_____

d. General comments about stormwater management at development
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

ORDINANCE APPENDIX 23-C

SAMPLE
CERTIFICATE OF OWNERSHIP
AND ACKNOWLEDGMENT OF APPLICATION

CERTIFICATE OF OWNERSHIP
AND ACKNOWLEDGMENT OF APPLICATION

COUNTY OF ADAMS, COMMONWEALTH OF PENNSYLVANIA

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

_____

Who being duly sworn, according to law, deposes and says that the person(s) listed below are the Owners of the property described in this application and that the application was made with prior knowledge and/or direction and does hereby agree with the said application and to the submission of the same.

_____
Property Owner(s)

_____ Notary Public

My Commission Expires _____, 20__

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

SIGNATURE OF APPLICANT

//

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

_____ Borough official submission receipt

Date complete application received _____ plan number_____

Fees _____ date fees paid _____ received by_____

Official submission receipt date _____

received by _____

ORDINANCE APPENDIX 23-D

SAMPLE
STANDARD BEST MANAGEMENT PRACTICES MAINTENANCE AND MONITORING AGREEMENT

STANDARD BEST MANAGEMENT PRACTICES MAINTENANCE AND MONITORING AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____ 200_ by and between _____, (hereinafter the"Landowner"), and _____, Adams County; Pennsylvania, (hereinafter "Municipality");

WITNESSETH

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

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

WHEREAS, the Subdivision/Land Management Plan (hereinafter "Plan") for the property identified herein, which is expressly made a part hereof, as approved or to be approved by the Borough, provides for management of stormwater within the confines of the Property through the use of Best Management Practices (BMP's); and

WHEREAS, the Borough and the landowner, his successors and assigns agree that the health, safety, and welfare of the residents of the Borough require that on-site stormwater Best Management Practices be constructed and maintained on the Property: and

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

BMP - Best Management Practice.

Infiltration Trench - a BMP surface structure designed, constructed, and maintained for the purpose of providing infiltration or recharge of stormwater into the soil and/or groundwater aquifer,

Seepage Pit - an underground BMP structure designed, constructed, and maintained for the purpose of providing infiltration or recharge of stormwater into the soil and/or groundwater aquifer,

Bioretention Facility - a BMP overlain with appropriate mulch and suitable vegetation designed, constructed, and maintained for the purpose of providing infiltration or recharge of stormwater into the soil and/or underground aquifer, and

Stormwater Structures and Facilities - shall include, but not be limited to, detention and retention basins, and BMP'S.

WHEREAS, the Borough requires, through the implementation of the _____ Subdivision and Land Development Plan, that stormwater management BMP's as required by said Plan and the Borough Ordinance be constructed and adequately maintained by the landowner, his successors and assigns.

The plan shall include, but not be limited to, the BMP site location, plan view and cross sectional drawings as appropriate, design calculations, material specifications, and any maintenance requirements imposed by. the Borough or its Designated Representatives, and

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

1. The onsite BMP facility shall be constructed by the landowner in accordance with the plans and specifications identified in the Plan.

2. The landowner shall maintain the BMP(s) as shown on the Plan in good working order acceptable to the Borough and in accordance with the specific maintenance requirements noted on the Plan which is attached hereto as Appendix 23-A and made part hereof.

3. The landowner hereby grants permission to the Borough, its authorized agents and employees, to enter upon the property, at reasonable times and upon presentation of proper identification, to inspect the BMP(s) whenever it deems necessary. Whenever possible, the Borough shall notify the landowner prior to entering the property.

4. In the event the landowner fails to maintain the BMP(s) as shown on the Plan in good working order acceptable to the Borough, the Borough may enter upon the Property and take whatever action is deemed necessary to maintain said BMP(s). This provision shall not be construed to allow the Borough to erect any permanent structure on the land of the landowner. It is expressly understood and agreed that the Borough is under no obligation to maintain or repair said facilities, and in no event shall this agreement be construed to impose any such obligation on the Borough.

5. In the event the Borough, pursuant to this agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the landowner shall reimburse the Borough for all expenses incurred within 10 days of receipt of invoice from the Borough.

6. The intent and purpose of this agreement is to insure the proper maintenance of the onsite BMP(s) by the landowner; provided, however, that this agreement shall not be deemed to create or effect any additional liability of any party for damage alleged to result from or be caused by nonpoint source pollution runoff.

7. The landowner, its executors, administrators, assigns, and other successors in interests, shall indemnify the Borough's employees and designated representatives against all damages, accidents, casualties, occurrences or claims which might arise or be asserted against said employees and representatives from the construction, presence, existence, or maintenance of the BMP(s) by the landowner or Borough. In the event that a claim is asserted against the Borough, its designated representatives or employees, the Borough shall

promptly notify the landowner and the landowner shall defend, at his own expense, any suit based on the claim. If any judgment or claims against the Borough's employees or designated representatives shall be allowed, the landowner shall pay all costs and expenses regarding said judgment or claim.

8. The Borough shall inspect The BMP(s) at a minimum of once every three years to ensure their continued functioning.

9. This agreement shall be recorded among the land records of Adams County, Pennsylvania and shall constitute a covenant running with the Property and/or equitable servitude, and shall be binding on the landowner, his administrators, executors, assigns, heirs and any other successors in interests, in perpetuity.

ATTEST:

WITNESS the following signatures and seals:

For the Borough:

(SEAL) _____

For the landowner:

(SEAL) _____

ATTEST:

_____ (City; Borough, Township)

County of _____, Pennsylvania

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

GIVEN UNDER MY HAND THIS _____ day of _____, 200_ .

_____

NOTARY PUBLIC

ORDINANCE APPENDIX 23-E

EXCEPTIONAL VALUE / HIGH QUALITY STREAM SEGMENTS IN ADAMS COUNTY

Adams County High Quality / Exceptional Value Stream Segments

Stream	Zone	Water Uses Prohibited
Toms Creek	Basin, source to LR 01053 (SR 3021) Bridge	High Quality Cold Water
Middle Creek	Basin, source to PA 116 Bridge (near Fairfield)	High Quality Cold Water

Source: Pennsylvania Code, Title 25. Environmental Protection, Chapter 93.