

Appendices

These appendices provide more detailed information on how local governments can tailor their water protection efforts. These appendices are not prescriptive and are not intended to be adopted in total. They are, rather, starting points from which local governments can, along with local community input, address their own drinking water resource protection challenges.

Appendix A

Excerpts from 1996 Federal Safe Drinking Water Act Amendments

Sec. 300j-13. Source water quality assessment

a) Source water assessment

2) *Program requirements*

A source water assessment program under this subsection shall -

- A) delineate the boundaries of the assessment areas in such State from which one or more public water systems in the State receive supplies of drinking water, using all reasonably available hydrogeologic information on the sources of the supply of drinking water in the State and the water flow, recharge, and discharge and any other reliable information as the State deems necessary to adequately determine such areas; and
- B) identify for contaminants regulated under this subchapter for which monitoring is required under this subchapter (or any unregulated contaminants selected by the State, in its discretion, which the State, for the purposes of this subsection, has determined may present a threat to public health), to the extent practical, the origins within each delineated area of such contaminants to determine the susceptibility of the public water systems in the delineated area to such contaminants.

3) *Approval, implementation, and monitoring relief*

A State source water assessment program under this subsection shall be submitted to the Administrator within 18 months after the Administrator's guidance is issued under this subsection and shall be deemed approved 9 months after the date of such submittal unless the Administrator disapproves the program as provided in section 300h-7(c) of this title. States shall begin implementation of the program immediately after its approval. The Administrator's approval of a State program under this subsection shall include a timetable, established in consultation with the State, allowing not more than 2 years for completion after approval of the program. Public water systems seeking monitoring relief in addition to the interim relief provided under section 300g-7(a) of this title shall be eligible for monitoring relief, consistent with section 300g-7(b) of this title, upon completion of the assessment in the delineated source water assessment area or areas concerned.

4) *Timetable*

The timetable referred to in paragraph (3) shall take into consideration the availability to the State of funds under section 300j-12 of this title (relating to State loan funds) for assessments and other relevant factors. The Administrator may extend any timetable included in a State program approved under paragraph (3) to extend the period for completion by an additional 18 months.

5) *Demonstration project*

The Administrator shall, as soon as practicable, conduct a demonstration project, in consultation with other Federal agencies, to demonstrate the most effective and protective means of assessing and protecting source waters serving large metropolitan areas and located on Federal lands.

6) *Use of other programs*

To avoid duplication and to encourage efficiency, the program under this section may make use of any of the following:

- A) Vulnerability assessments, sanitary surveys, and monitoring programs.
- B) Delineations or assessments of ground water sources under a State wellhead protection program developed pursuant to this section.
- C) Delineations or assessments of surface or ground water sources under a State pesticide management plan developed pursuant to the Pesticide and Ground Water State Management Plan Regulation (subparts I and J of part 152 of title 40, Code of Federal Regulations), promulgated under sec. 136a(d) of title 7.
- D) Delineations or assessments of surface water sources under a State watershed initiative or to satisfy the watershed criterion for determining if filtration is required under the Surface Water Treatment Rule (section 141.70 of title 40, Code of Federal Regulations).
- E) Delineations or assessments of surface or ground water sources under programs or plans pursuant to the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.).

Appendix B

State of Delaware Source Water Protection Law of 2001

Synopsis

This Bill requires county governments and municipalities with populations of 2,000 or more, as part of the updates to the 2007 Comprehensive Land Use Plans, to adopt maps delineating source water assessment, wellhead protection and excellent groundwater recharge areas, and regulations governing the use of land within those critical areas designed to protect drinking water supplies. The bill obligates DNREC to provide the necessary technical assistance to local governments to adopt these measures and defines and clarifies source water and wellhead protection areas as critical areas as defined under Chapter 92, Title 29 of the Delaware Code. The bill also requires that a citizen and technical advisory committee be consulted in the implementation of the Source Water Assessment Plan and closely related matters.

141st General Assembly Delaware State Senate Bill 119

Signed into law: June 27, 2001

Title 7 Chapter 60 Subchapter VI: Source Water Protection

WHEREAS, sixty percent of the residents of the State of Delaware rely on ground water and forty percent rely on surface water as their sole sources of drinking water; and

WHEREAS, certain public drinking water supplies exceed maximum contaminant levels for various chemical constituents; and

WHEREAS, the United States Congress has mandated the assessment of drinking water supplies through the provisions of the Safe Drinking Water Act Amendments of 1996; and

WHEREAS, the United States Congress has encouraged the protection of drinking water supplies through the provisions of the Safe Drinking Water Act Amendments of 1996; and

WHEREAS, the United States Environmental Protection Agency granted approval of the State of Delaware's Wellhead Protection Plan on July 31, 1990 and the State of Delaware Source Water Assessment Plan on October 27, 1999; and

WHEREAS, the State of Delaware is required to complete the delineation of source water assessment areas and an assessment of their susceptibility to contamination for all public water supplies by April 2003; and

WHEREAS, the State of Delaware will have completed mapping the areas of ground water recharge potential within the state by 2001; and

WHEREAS, the protection of existing and proposed sources of water for public consumption is critical to protection of public health and the environment and continued economic prosperity.

NOW, THEREFORE: BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF DELAWARE:

Section 1. Amend §6002, Chapter 60, Title 7, Delaware Code by adding new definitions as follows:

(63) 'Delineation' shall mean the process of defining and/or mapping a boundary that approximates the areas that contribute water to a particular water source used as a public water supply.

(64) 'Public Drinking Water System' shall mean a community, non-community, or non-transient non-community water system, which provides piped water to the public for human consumption. The system must have at least 15 service connections or regularly serve at least 25 individuals daily for at least 60 days.

(65) 'Source Water' shall mean any aquifer or surface water body from which water is taken either periodically or continuously by a public drinking water system for drinking or food processing purposes.

(66) 'Source Water Assessment Area' shall mean the delineated area which contributes water to a public water supply system. This is called a wellhead protection area for a well and a watershed or basin for a surface water intake. A Source Water Assessment Area shall constitute a critical area as defined under Chapter 92, Title 29 of the Delaware Code.

(67) 'Source Water Assessment Plan' shall mean the October 1999 U.S. EPA approved plan for evaluating the sources of public drinking water in Delaware for their vulnerability and susceptibility to contamination.

(68) 'Source Water Assessment' shall mean the identification and evaluation of the sources of water within the state that are used by public drinking water systems in an effort to determine the susceptibility of those sources to contamination.

(69) 'Wellhead Protection Area' shall mean the surface and subsurface area surrounding a water well, or wellfield supplying a public water system through which contaminants are likely to reach such well, or wellfield. A Wellhead Protection Area shall constitute a critical area as defined under Chapter 92, Title 29 of the Delaware Code.

(70) 'Wellhead Protection Plan' shall mean the March 1990 U.S. EPA approved plan for protecting the quality of drinking water derived from public water supply wells in Delaware.

(71) 'Excellent Ground-Water Recharge Potential Area' shall mean any area where soils and sedimentary deposits of the most coarse grained nature have the best ability to transmit water vertically through the unsaturated zone to the water table as mapped by the methods described in the Delaware Geological Survey Open File Report No. 34, "Methodology For Mapping Ground-Water Recharge Areas in Delaware's Coastal Plain" (August 1991), and as depicted on a series of maps prepared by the Delaware Geological Survey. An Excellent Ground-Water Recharge Potential Area shall constitute a critical area as defined under Chapter 92, Title 29 of the Delaware Code."

(72) 'Source Water Protection Citizens Technical Advisory Committee' shall mean a group to advise the Secretary of the Department of Natural Resources and Environmental Control including, but not limited to, representatives of the following organizations or municipalities: DNREC, Department of Health and Social Services, Department of Agriculture, the Delaware Nature Society, the Delaware Public Health Association, the American Association of Retired Persons, the United States Geological Survey, the Christina River Conservancy, the Water Resources Agency of the University of Delaware, the Council of Farm Organizations, the Delaware Rural Water Association, the League of Women Voters, the Friends of Herring Creek, the Civic League of New Castle County, the Delaware Geological Survey, the Committee of 100, the City of Dover, the City of Lewes, the New Castle County Department of Land Use, Kent County Levy Court, Sussex County Council, the League of Local Governments, the Sussex County Association of Towns, the Homebuilders Association of Delaware, the Commercial Industrial Realty Council, public water suppliers and the Delaware Association of Professional Engineers."

**Section 2. Amend Chapter 60, Title 7, Delaware Code by redesignating existing Subchapters VI, and VII as Subchapters VII and VIII and by adding a new subchapter to read as follows:
"Subchapter VI. Source Water Protection"**

§6081. Reporting on Source Water Protection

(a) The Secretary shall prepare, periodically, a report to the Governor and General Assembly, beginning in 2003, of the potential threats, including contaminants currently not regulated, to public drinking water systems. The report shall identify actions that the Secretary proposes to control these threats.

(b) The Secretary shall periodically prepare a report to the respective counties and municipalities, beginning in 2003, that denotes the availability of source water assessments completed by the Department. The Secretary shall also report on the status of the Ground-Water Recharge Potential mapping project.

§6082. Adoption of Source Water Assessment, Wellhead Protection, and Excellent Ground-Water Recharge Potential Areas by Counties and Municipalities

By December 31, 2004, the Department shall develop a guidance manual, in conjunction with and with the substantial concurrence of the Source Water Protection Citizens Technical Advisory Committee, for desirable land uses within source water assessment areas that promote the long-term protection of public drinking water supplies, consistent with "Shaping Delaware's Future: Managing Growth in 21st Century Delaware, Strategies for State Policies and Spending" (December 1999)

(b) The counties and municipalities with populations of 2,000 persons or more, with the assistance of the Department, shall adopt as part of the update and implementation of the 2007 Comprehensive Land Use Plans, the overlay maps delineating, as critical areas, source water assessment, wellhead protection, and excellent groundwater recharge potential areas. Furthermore, the counties and municipalities shall adopt, by December 31, 2007, regulations governing the use of land within those critical areas designed to protect those critical areas from activities and substances that may harm water quality and subtract from overall water quantity.

(c) Municipalities with populations of less than 2,000 persons, with the assistance of the Department, may adopt by ordinance, the overlay maps delineating, as critical areas, source water assessment, wellhead protection, and excellent ground-water recharge potential areas. Furthermore, the ordinance shall include regulations governing the use of land within those critical areas designed to protect those critical areas from activities and substances that may harm water quality and subtract from overall water quantity. Counties and municipalities of more than 2,000 persons that have previously adopted ordinances that include the Department's overlay maps and regulations that protect public water supplies and are consistent with minimum standards identified in the guidance manual shall be exempt from the provisions of this subsection.

(d) The Department shall make source water assessment areas available to the public as they are completed, with all systems to be completed by 2003.

(e) The Department may, when based on sound science and factual information, revise and update the overlay maps of source water assessment areas.

(f) Counties and municipalities with populations of 2,000 persons or more shall update their overlay maps in accordance with changes made by the Department with respect to source water assessment, wellhead protection, and excellent ground-water recharge potential areas.

(g) Municipalities with populations of less than 2,000 persons may update their overlay maps in accordance with changes made by the Department with respect to source water assessment, wellhead protection, and excellent ground-water recharge potential areas.

§6083. Adoption of Source Water Assessment, Wellhead Protection and Excellent Ground-Water Recharge Potential Areas by the Governor's Cabinet Committee on State Planning Issues.

The Department shall make source water assessment, wellhead protection, and excellent ground-water recharge potential area delineations available for maps developed as part of "Shaping Delaware's Future: Managing Growth in 21st Century Delaware, Strategies for State Policies and Spending" (December 1999).

§6084. Source Water Protection Citizen and Technical Advisory Committee.

The Secretary shall consult a citizen and technical advisory committee, as established by the Delaware Source Water Assessment Plan, on matters related to the implementation of the Source Water Assessment Plan and the requirements of this statute."

Appendix C

Town of Middletown Draft Model Ordinance

MIDDLETOWN WATER RESOURCE PROTECTION AREA AND ENVIRONMENTAL PROTECTION REGULATIONS

(DRAFT July 26, 2002)

Section 1100 Intent.

The intent of this section is to provide clarification on the environmental constraints and requirements for development in environmentally sensitive areas.

Section 1101 Definitions.

This section defines words, terms, and phrases found in this article.

Applicant. A person, firm or government agency that executes the necessary forms to obtain approval or a permit for any zoning, subdivision, land development, building, land disturbance, or other activity regulated by the Code.

Aquifer. A body of rock (crystalline, sand or gravel) that contains sufficient saturated permeable material to conduct groundwater springs or to yield economically significant quantities of groundwater to wells.

Best Management Practices. That combination of conservation measures, structures, vegetation or management practices that reduces or avoids adverse impacts of development on adjoining site's land, water, or waterways and waterbodies.

Buffer. A designated area between two (2) uses deemed incompatible with each other, or along the perimeter of a natural feature to be protected from an incompatible use, or along the perimeter of that use, which will absorb otherwise preclude such incompatibility by some combination of construction design, vegetative plantings, fences, and/or maintenance practices which shall be permanently maintained.

Buffer, Riparian. See *Riparian Buffer Area*

Caliper. The diameter of new landscape plantings measured six (6) inches above ground.

Canopy Tree. See *Tree, Canopy*

Clean Fill. A nondecomposable, environmentally inert solid, such as rock, soil, gravel.

Clearcutting. The practices of wholesale complete removal of all trees, disturbing shrubs, or other vegetation in the process. This definition does not include the selective removal of trees on a building pad or normal maintenance of vegetation.

Critical Natural Area (CNA). Any site listed in the state natural areas inventory, as administered by the State Office of Nature Preserves, Division of Parks and Recreation, or the Delaware Department of Natural Resources and Environmental Control.

Critical Natural Areas Report. A report analyzing the impact of a development or subdivision proposal on a CNA located on the site, which shall include the following elements:

- A) A statement that an entire lot or parcel is included in the critical natural areas investigation or a description of a smaller area which is subject to the critical natural areas investigation;
- B) A scaled plan of the site accurately depicting critical natural area boundaries. The CNA boundary lines shall be identified with a metes and bounds description prepared by and bearing the seal of a professional land surveyor registered in the State, or a professional engineer with a background in civil engineering

registered in the state. Where many survey traverses are necessary to accurately describe the CNA boundary the developer may have the surveyor or engineer identify and prepare a metes and bounds description for the smallest polygon that contains all the critical natural areas identified on the site. In such instances, however, the limits of the polygon will be considered the CNA boundaries for plan review purposes;

- C) A narrative description of the extent to which the subdivider or developer proposes land disturbing activities within any critical natural areas which are shown on the scaled plan; and
- D) Any measures that will be taken to minimize or mitigate the disturbance of critical natural areas.

Detention/Retention Basin. A natural or man-made structure designed as a temporary holding basin for water. Water may be detained to minimize flooding downstream, or retained to increase aquifer recharge.

Drainage. The process by which surface water (usually from rainfall) moves across the land surface. See *Stormwater Management*.

Drainage Areas. The delineated areas that currently contribute or are proposed to contribute runoff to a specific location or point.

Drainage Facility. Any system of artificially constructed drains, including open channels and separate stormwater sewers, used to convey storm, surface, or groundwater, either continuously or intermittently, to natural water courses.

Drainageway. A minor watercourse, seasonally or continually available for the passage of water, of which functions include, but are not limited to: flood control, groundwater recharge, drainage, and sedimentation and erosion control. The presence of a drainageway is determined by one (1) or more of the following three (3) conditions: 1) the presence of certain specific soil types, (such as Codorus silt loam (Co), Comus silt loam (Cu), Hatboro silt loam (Ha), Johnston loam (Jo), or Mixed alluvial land (Mv)); 2) the land on either side of and within fifty (50) feet of the centerline of any intermittent or perennial stream shown on the United States Geological Survey (U.S.G.S.) 7.5 minute quadrangle sheets; 3) the land on either side of and within twenty-five (25) feet of the centerline of any swale identified by the U.S.G.S. 7.5 minute quadrangle sheet as having an upstream drainage area of five (5) or more acres.

Environmental Report. Any study, report or application required by this Code, such as critical natural areas, floodplains, riparian buffers, steep slopes, water resource protection areas and wetlands.

Filling. The depositing on land, whether submerged or not, of sand, gravel, earth or other materials. Biodegradable materials and other materials subject to decomposition or significant settling (such as garbage and other organic matter) shall not be considered filling.

Flood Fringe. Those portions of the floodplain, outside the floodway, subject to inundation by the one hundred (100) year recurrence interval flood and generally associated with standing or slowly moving water, rather than rapidly flowing water. Flood fringe is determined by detailed study data and profiles found in the FEMA Flood Insurance Study.

Floodplain. A relatively flat or low-lying land area adjoining a river, stream, or watercourse that is subject to periodic partial or complete inundation. Specifically, those areas identified by the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRM) as being subject to periodic inundation by a one hundred (100) year storm, including the floodway, flood fringe and areas for which no base flood elevations area available as depicted in the FEMA Flood Insurance Rate Maps (community no. 10585) dated April 17, 1996 or as later amended.

Flood Protection Elevation. A point two (2) feet above the water surface elevation of the one hundred (100) year flood.

Floodway. The portion of the floodplain district required to carry and discharge the waters of the one hundred (100) year flood without increasing the water surface elevation at any point more than one (1) foot above existing conditions as demonstrated in a flood insurance study.

Forest. An area covered by a canopy of woody plants (trees) that qualifies as mature and/or young. It may also be a woodland, woodlot, grove, or stand of trees meeting the specifications of the forest type.

Forest, Mature. An area or stand of trees whose total combined canopy covers an area of one (1) acre or more composed of canopies of trees having a DBH of at least eighteen (18) inches or greater covering at least seventy-five (75) percent of that area. Also, any stand or grove consisting of eight (8) or more individual trees having a DBH of at least eighteen (18) inches whose combined canopies cover at least fifty (50) percent of the area encompassed by the grove.

Forest, Young. An area or stand of trees whose total combined canopy covers an extra of one (1) acre or more, with canopy trees having a DBH of six (6) inches and covering at least sixty (60) percent of the area. However, no trees kept or grown for commercial purposes shall be considered a young forest.

Forest Management Practices. That combination of generally accepted methods for preserving, promoting and protecting silviculture, which may include selective cutting, burning and removal of trees.

Grading. The excavating, filing (including hydraulic fill) or stockpiling of earth materials, or any combination thereof, including the land in its excavated or filled condition.

Groundwater. A portion of the subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hydric Soils. Soils which in their natural, undrained state are wet frequently enough at or near the surface to periodically produce anaerobic conditions, thereby influencing plant species composition and/or growth.

Infiltration. The passage or movement of water through the soil profile.

Land Grading. See Grading.

Landscape Plan. A plan associated with a subdivision, land development or parking facility plan indicating the placement of trees, shrubs, growth cover and affiliated structures and improvements, including specifications, species, quantities and installation as prepared by a Delaware registered landscape Architect.

Landscaping. The design and installation of plant material such as lawns, groundcover, trees, bushes, etc.

Mitigation. Any action taken to lessen the specified undesirable impacts of a proposed land use or land disturbance activity, including those which would adversely affect the health or longevity of a natural feature, pose a visual intrusion or conflict, or otherwise be deemed incompatible with surrounding properties.

National Geodetic Vertical Datum (NGVD). Elevations referenced to mean sea level datum of the 1929 or 1988 U.S. Geological Survey.

Non-delineated floodplain. An area subject to a 100-year flood, adjacent to a watercourse that is identified by a blue line on the current United States Geological Survey (USGS) topographic maps of the County or in the detailed maps of the N.C.C. Soil Survey for which FEMA has delineated a floodplain.

Public Water Supply Well. A well from which the water is used to serve a community water system by section 22.146 (Public Water Systems) in the Delaware state Regulations Governing Public Drinking water Systems.

Recharge Areas. The recharge water resource protection areas are designated as having the best potential for groundwater recharge. They were delineated using methodology described in a report prepared by the Delaware Geological Survey entitled "Delineation of Ground-Water Recharge Resources Protection Areas in the Coastal Plain of New Castle County, Delaware," dated January 1993 ("recharge resource area").

Reforestation. Replanting or planting of forest plant materials.

Restoration. The reasonable rehabilitation of the affected land for useful purposes and the protection of the natural resources of the surrounding area, including surface water and groundwater.

Riparian Buffer Area (RBA). Where a parcel of land is adjacent to a perennial, lake, tidal wetland or area draining greater than ten (10) acres forming a transition zone between the aquatic and the terrestrial environments is proposed for development or redevelopment, a RBA shall be designated. The RBA shall include the waterbody and the adjacent area within at least one hundred (100) feet from the top of bank of the waterbody. The RBA shall also include the floodplain or non-tidal wetland plus the adjacent area within a minimum of fifty (50) feet of the resource.

A) **Identification and Calculation.**

- 1) Streams (perennial, intermittent, mapped, and unmapped) with identifiable banks and beds, lakes, and tidal wetlands or areas which drain greater than ten (10) acres are subject to the regulations of this section.
- 2) Initial identification of the watercourses/waterbodies shall be made using the U.S. Geological Survey quadrangle maps or more accurate information, as available. Field verification to determine evidence and location of channelized flow is required for a specific determination.
- 3) The width of existing impervious area such roadways, parking lots, structures, sidewalks, etc. shall not count towards the RBA measurements.

B) **Exceptions.** An RBA shall not be designated along industrial ponds, sewage lagoons, man-made irrigation ditches, stormwater management basins and other artificial features with a similar water quality or storage function.

Runoff. That portion of precipitation or snow melt that has not evaporated or infiltrated into the soil, but flows on land surface.

Sanitary Sewage Disposal, On-lot. A system in which sanitary sewage and wastewater is collected from a single use or dwelling unit, by a system of pipes, and carried to a septic tank and tile disposal field located within the boundaries of an individual lot.

Septic Tank. A multiple compartment, watertight receptacle which receives sewage from a building and is designed and constructed so as to permit settling of solids from the sewage, digestion of the organic matter and discharge of the liquid portion into a disposal area.

Septic System, Individual. See *Sanitary Sewage Disposal, On-lot.*

Slope, Steep. The term slope is defined as the vertical change in elevation divided by the horizontal distance over which that vertical change occurs. The steep slope area consists of two (2) areas which are delineated and defined as follows:

- A) **Prohibitive slope.** Prohibitive slopes are those of greater than twenty-five (25) percent slope as based on a site survey, where such slope exists in any continuous horizontal increment of fifty (50) feet or more.
- B) **Precautionary slope.** Precautionary slopes are those of fifteen (15) to twenty-five (25) percent slope as based on a site survey, where such slope exists in any continuous horizontal increment of fifty (50) feet or more.

These definitions do not include manmade steep slopes resulting from the implementation of an approved plan.

Stormwater Management. The mitigation of the hydrologic impacts of lost natural runoff storage by the use of constructed storage facilities.

- A) For water quantity control, a system of vegetative, structural, and other measures that may control the volume and rate of stormwater runoff which may be caused by land disturbing activities or activities upon the land; and
- B) For water quality control, a system of vegetative, structural, and other measures that control adverse effects on water quality that may be caused by land disturbing activities or activities upon the land.

Surface Water. Natural or artificial bodies of water greater than one (1) acre in extent at the normal annual water level, as depicted on U.S.G.S. topographic quadrangles and/or as determined by on-site surveys by a registered surveyor, landscape architect or engineer. Excluded from this definition are retention basins or other stormwater

management facilities, farm ponds or other facilities associated with agricultural operations, sewage lagoons and other facilities for which normal maintenance and repair is necessary.

Top of Bank. A point above the mean water surface of a watercourse that defines the maximum depth of channel flow in the watercourse. It is either determined visually or computed as an elevation using the peak rate of runoff from a two (2) year storm event.

Middletown Proper. The area of the Town that is considered the Downtown or Center of Town that consists of the businesses, commercial facilities, industrial areas, and residential housing developments previously constructed and in existence in the Town prior to January 2000. Refer to Figure 11-11.1 in section 1111 for the exact mapped boundary designation.

Middletown Greenbelt. The tracts of land located around the perimeter of Middletown Proper consisting of undeveloped properties and agricultural land. Refer to Figure 11-11.1 in section 1111 for the exact mapped boundary designation.

Tree, Canopy. A tree whose leaves would occupy the upper level of a forest in a natural ecological situation. These trees are also called shade trees, and typically reach heights of fifty (50) to one hundred (100) feet at maturity.

Tree, Understory. A tree whose leaves would occupy the intermediate level of a forest in a natural ecological situation. They are also found as dominant species in old field succession. These trees are also called ornamental trees.

Variance. Relief from the standards of this Section.

Waterbody. Any watercourse, tidal wetland or lake defined by a bank or shore in which water can be found.

Watercourse. A stream channel (perennial, intermittent, mapped or unmapped) with banks and a bed within which concentrated water flows.

Water Resource Protection Area. Water resource protection areas are Wellheads Class A and Recharge areas. All such areas are as depicted on the three-map series "Water Resource Protections areas for the City of Newark, City of Wilmington, New Castle County, Delaware," prepared by the Water Resources Agency for the County that is dated 1993, or as amended.

Water table. The level below the surface at which the ground is saturated by water.

Wellhead. The wellhead water resource protection areas are surface and subsurface areas surrounding public water supply wells or wellfields where the quantity or quality of groundwater moving toward such wells or wellfields may be adversely affected by land use activity. Such activity may result in a reduction of recharge or may lead to introduction of contaminants to groundwater used for public supply ("wellhead").

- A) **Class A:** The wellhead zone shall include the area within a three hundred (300) foot radius circle around all public water supply wells which are classified as community water systems, as defined by section 22.157 (public water systems), in the State of Delaware Regulations Governing Public Drinking Water Systems.

Wetland. Those areas 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; or areas that are defined and delineated in accordance with the "Federal Manual for Identifying and Delineating Jurisdictional Wetlands" dated January 10, 1989, and as may be amended from time to time; or as further defined and delineated by the U.S. Army Corps. Of Engineers, the U.S. Environmental Protection Agency, or the Delaware Department of Natural Resources and Environmental Control.

Wetland Delineation and Report. An on-site method or process for identifying wetlands as described in the Corps of Engineers Wetland Delineation Manual, Technical Report: Y-87-1, from 1987 and as amended. The report shall be prepared by a person with professional experience and knowledge in wetlands identification and shall analyze a site for the existence and extent of wetlands.

Section 1102 Open Space Regulations and Allowable Uses.

- A) Table 11-2.1 lists uses that may be permitted in open space. Any use not listed shall be considered prohibited.

Section 1103 Floodplains and Floodways.

- A) Intent: This section shall detail the requirements, allowable disturbances, and permitted construction practices within all floodplains and floodways within the Town.
- B) Boundary interpretation. Where there appears to be a conflict between a mapped boundary and actual field conditions, a determination of the exact boundary of the area subject to inundation by the base flood shall be made using the one hundred (100) year flood elevation information provided in the flood insurance study for the flood fringe portions of the floodplain and using the best one hundred (100) year floodplain elevation information available for general floodplain areas. For the floodway portion of the floodplain the exact boundaries shall be determined by scaling the distances shown on the floodway map and by utilizing the data in the applicable flood insurance study (FIS) for the area. Where the boundary of the floodplain is disputed, the burden of proof shall be on the applicant.
- C) There are two (2) areas within the floodplain, the floodway and the flood fringe.
 - 1) No structure shall intrude into the floodway or floodplain except for piers needed to support bridges, erosion control structures, dams for flood control or water supply, and utility crossings.
 - 2) No filling is permitted in floodways or floodplains.
 - 3) No structures designed for human habitation are permitted.
- D) Standards for beneficial uses in floodplains.
 - 1) All new construction, reconstruction, subdivision proposals, substantial improvements or repairs, prefabricated structures and other developments shall be prohibited except where approved as essential to the beneficial use of property. Refer to table 11-2.1 for permitted beneficial uses. Approval shall be at the discretion of the Town.

Section 1104 Wetlands.

- A) Wetland mitigation shall be that for which a permit has been issued by the United States Army Corps of Engineers. Permits from the State may also be required.
- B) It is permissible to construct utility and access crossings within Wetlands where no other recourse is available. The proposed use must be authorized by the Town and meet the requirements of the Town Code, Army Corps of Engineers regulations, and the DNREC. No other forms of construction are permitted in areas designated as Wetlands.
- C) Any work in buffer areas shall meet the requirements of the Town Code, Army Corps of Engineers regulations, and the DNREC.

Table 11-2.1									
USES IN REQUIRED OPEN SPACE									
Y=Permitted N=Prohibited L=Limited Use I=Environmental Impact Assessment Report, (See Section 1114)									
Use	General Open Space	Floodway	Floodplain	Wetland	Riparian Buffer	Drainage-ways	Wellhead/Recharge Areas	Steep Slopes	Forests
<i>Agricultural</i>									
Apiaries	Y	N	N	N	Y	Y	Y	Y	Y
Clearing	L	N	N	N	N	L	L	L	L
Game Farms/Fish Hatcheries	Y	L	L	I	L	L	N	N	N
Field Crops	Y	L	L	N	L	Y	L	N	N
Orchards	Y	N	Y	N	L	Y	L	Y	N
Pasture	Y	L	L	N	L	N	N	Y	N
Stables	Y	N	N	N	N	N	N	N	L
Nursery	Y	N	L	N	L	Y	Y	Y	N
<i>Recreation and Amusement: Outdoor Recreation</i>									
Ball Fields	Y	N	L	N	N	Y	Y	N	L
Day Camps	N	N	L	N	L	Y	L	N	L
Fishing Areas	Y	Y	Y	Y	Y	Y	L	L	L
Hunting Areas	L	L	L	L	L	L	L	L	L
Natural Area	Y	Y	Y	Y	Y	Y	Y	Y	Y
Nature Center	Y	N	N	N	N	Y	Y	Y	Y
Picnic Area/Playground	Y	N	L	N	L	Y	Y	Y	Y
Pools/Courts	Y	N	N	N	N	Y	Y	N	L
Shooting and Archery Ranges	L	L	L	N	L	L	L	N	L
Trails	Y	Y	Y	Y	Y	Y	Y	Y	Y
Water Dependent Use	N	L	L	L	L	Y	N	N	N
<i>Industrial Uses: Utilities, Community/Region</i>									
Public/Private Roads	Y	N	N	L	I	Y	L	L	L
Parking Lots	L	N	N	N	N	L	N	N	N
Essential Access	Y	I	I	L	I	L	L	L	L
Sewer/Water/Utilities	Y	I	I	L	I	Y	Y	Y	L
Sewage & Water Treatment Plants/Pumping Stations/Dams	N	I	I	N	I	N	N	N	N
Detention/Retention Basins	Y	N	N	N	L	Y	L	N	N
Public Interest Event	Y	N	N	N	N	Y	Y	N	L

Section 1105 Riparian Buffer Areas (RBA).

- A) Intent: This section shall detail the requirements, allowable disturbances, and permitted construction practices within all Riparian Buffer Areas within the Town.
- B) The water body buffers shall meet the following standards which are intended to preserve and enhance existing vegetation and to re-vegetate disturbed areas. All riparian buffer shall be mapped to delineate the

resource. No vegetation shall be removed in the RBA and existing native vegetation shall be preserved to the maximum extent possible. RBA shall extend a minimum of 100' past each top of bank for all waterbodies or 50' past the floodplain or non-tidal wetland line (which ever is greater). All RBA areas shall be classified as old field, disturbed land, or meadow, and planted in accordance with this Section where native vegetation is not present. The mapping of RBA's shall be supplied with an exploratory plan and at subsequent plan submissions to meet the standards of this Section.

- C) Surface water bodies.
 - 1) No septic systems shall be allowed within an RBA.
 - 2) All developments shall maximize the drainage amount conducted in natural swales rather than storm sewers. A stormwater system's discharge to streams or watercourses shall be by sheet flow through a grassland or discharged from a stormwater management facility having a wetland or aquatic bench.
 - 3) Stormwater runoff from all parking areas shall be directed to a stormwater management facility before it is discharged into an RBA.

Section 1106. Steep Slope Protection.

- A) Intent. The intent of this section is to protect hillsides and their related soil and vegetative resources, thereby minimizing adverse environmental effects (refer to Section 1101 for all applicable definitions). Specific objectives include the following:
 - 1) Conservation and protection of precautionary and prohibitive slopes from inappropriate development such as excessive grading, land-form alteration and extensive vegetation removal.
 - 2) Avoidance of potential hazards to life and property and the disruption of ecological balance that may be caused by increased runoff, flooding, soil, erosion and sedimentation, blasting and ripping of rock and landslide and soil failure.
 - 3) Protection of the entire township from uses of land that may result in subsequent expenditures for public works and disaster relief and adversely affect the economic well-being of the township.
 - 4) Encouragement of the use of precautionary and prohibitive slopes for open space and other uses that are compatible with the conservation and protection of natural resources.
- B) Applicability and scope. This regulates the circumstances in which any use may occur on areas of precautionary and prohibitive slopes.
- C) Permitted uses in areas of precautionary and prohibitive slopes. The following uses and no other are permitted in areas of precautionary and prohibitive slopes:
 - 1) Agricultural uses not requiring cultivation or structures.
 - 2) Game preserve, wildlife sanctuary, woodland preserve or similar conservation uses not requiring structures.
 - 3) Passive recreation.
 - 4) Water supply wells with the approval of the Township Engineer and consistent with the DNREC regulations.
 - 5) Other uses within these areas may be permissible upon approval of the Town via a conditional use or variance application.
- D) Prohibited uses in areas of precautionary and prohibitive slopes. The following uses and activities are specifically prohibited and shall not be subject to variance:
 - 1) Structures.
 - 2) Cut and fill.
 - 3) Soil, rock or mineral extraction.
 - 4) Removal of topsoil.
 - 5) On-site sewage disposal systems.
 - 6) Roads, driveways and parking lots.
- E) Conditional uses in areas of prohibitive slopes. The Town is authorized to grant conditional uses in the form of variances for the following uses, subject to recommendations of the Township Engineer.
 - 1) Agricultural cultivation and agricultural uses requiring structures.
 - 2) Conservation uses requiring structures.
 - 3) Passive recreation uses requiring structures.
 - 4) Utility easements and rights-of-way.
 - 5) Accessory structures

- 6) Individual driveways accessory to single-family detached dwellings only if the Town determines that no practicable alternative alignments exist.
- F) Conditional uses in areas of precautionary slopes. The Town is authorized to grant conditional uses in the form of variances for the following uses, subject to recommendations of the Town Engineer.
- 1) district in which the property is located.
 - 2) Recreation use, whether open to the public or restricted to private membership, such as parks, camps, picnic areas and golf courses, when permitted in the district in which the property is located. Not to be included are enclosed structures except toilet facilities but permitting small shelters usually found in developed outdoor recreational areas. Any toilet facilities provided shall be connected to central water and sewage systems.
 - 3) Stormwater management facilities
 - 4) Roads, driveways and parking lots.
 - 5) Central sanitary sewer systems.
 - 6) Accessory uses and structures.
- G) Standards for variances. The Town, in considering a variance, shall consider the following:
- 1) Degree of modification proposed to the topographic, soil and vegetation resources.
 - 2) Techniques and extent of mitigation proposed to offset potential adverse environmental effects.
 - 3) Effects on adjacent and neighboring properties.
- H) Additional standards for variances. An affirmative decision shall not be issued by the Town for a variance unless there is evidence that:
- 1) Development is being proposed on areas of precautionary or prohibitive slopes only because no other alternative location is practicable.
 - 2) Earthmoving activities and vegetation removal will be conducted only to the extent necessary to accommodate the proposed uses and structures and in a manner that will not cause excessive surface water runoff, erosion, sedimentation and unstable soil conditions.
 - 3) Mitigation techniques will be utilized, including but not limited to retaining walls, tree wells, the establishment of ground covers and/or low spreading shrubs and the use of erosion control fabric.
 - 4) Proposed structures will be of sound engineering design and footings will be designed in response to the site's slope, soil and bedrock characteristics.
- I) Application procedures for variances. An application for a permit shall be filed with the Town who shall make an initial determination on the application. For a use other than those permitted in this section, an application seeking approval for a variance shall be forwarded to the Town, as appropriate, along with required studies or information. The application for a variance shall be accompanied by the following:
- 1) Plans drawn to a scale of at least one inch equals 50 feet depicting the following:
 - a) Location, dimensions and elevation of the property.
 - b) Existing and proposed uses and development.
 - c) Existing and proposed contours at two-foot intervals.
 - d) Location and boundaries of steep slopes and very steep structures.
 - e) Cross-sections and elevations of the property and proposed structures.
 - f) Existing and proposed land cover characteristics of that portion of the property within the area of precautionary or prohibitive slopes, indicating wooded areas, open areas, ground cover types, any areas with impervious surfaces and subsurface soil types.
 - 2) Photographs showing existing uses, vegetation and topography of areas of precautionary and prohibitive slopes.
 - 3) Narrative report describing the slope, soil and vegetation characteristics of that portion of the property within the area of the precautionary or prohibitive slopes. Such report shall also describe:
 - a) Proposed types of structures and methods of construction, types of foundation system (s) to be employed and proposed landscaping, sewage disposal and water supply.
 - b) Sediment and erosion control measures.
 - c) Engineering and conservation techniques intended to alleviate adverse environmental effects that may be created by the proposed use.

Section 1107 Drainageways.

- A) In addition to the open space protection, the drainageway area protected shall be kept open to provide continuous drainage corridors. Positive surface drainage in these areas shall be preserved. The protected area may be regraded and reshaped to provide for stormwater management and drainage.
- B) The following standards shall govern the design of stormwater management or surface drainage systems in drainageways in conjunction with the Delaware Department of Natural Resources and Environmental Control (DNREC):
 - 1) The drainage shall be designed to slow the time of concentration on the site and retain maximum ground infiltration.
 - 2) Where flows permit, the channels shall be designed as grassed swales, wetlands, or mesic grasslands encouraging sheet flow, except in forests.
 - 3) All permanent pool stormwater management ponds shall be designed to have aquatic benches planted approved plant materials.

Section 1108 Critical Natural Areas (CNA)

The applicant is required to contact the DNREC for the determination of all potential CNA and shall follow the State guidelines for developmental procedures.

Section 1109 Water Resources Protection Areas (WRPA).

Water resource protection areas are Class A Wellheads and Excellent Recharge Areas. All such areas are as depicted on the three-map series "Water Resource Protections Areas for the City of Newark, City of Wilmington, New Castle County, Delaware," prepared by the University of Delaware Water Resources Agency revised May 2001. These areas shall be protected as required by the following sections to protect the Town's water resources from contamination and pollution.

Section 1110 Wellheads Class A.

- A) Areas within three hundred (300) feet of the well shall be one hundred (100) percent open space.
- B) The protection area around the well may be reduced to a one hundred and fifty (150) foot radius provided a hydrogeological report, prepared by a Delaware Registered Geologist and submitted to the satisfaction of the Delaware Geological Survey and the DNREC, is prepared. The report must certify that (1) the minimum 60-day time of-travel from a point to the public water supply well is maintained and (2) the well draws from a confined aquifer.
- C) The natural runoff flowing into wellhead areas shall be allowed and all new stormwater run-off shall be diverted around the wellhead protection areas wherever practical.
- D) The stormwater system's discharge to wellhead WRPAs shall be by sheet through a grassland or discharge from a stormwater management facility having a wetland or aquatic bench. Stormwater runoff from all parking areas shall be directed to a stormwater management facility before it is discharged into a wellhead WRPA.
- E) Within the wellhead area, impervious surfaces shall be limited to the buildings and access associated with the well and distribution and treatment facilities and their maintenance.
- F) The minimum lot area for a proposed public water supply well and related facility drawing from a confined aquifer shall be 1 acre and the minimum lot area for a public well drawing from an unconfined aquifer shall be 2 acres.

Section 1111 Excellent Recharge Areas.

Recharge Areas are those areas with high percentages of sand and gravel that have "excellent" potential for recharge as determined through a Stack Unit Mapping Analysis performed originally by the Delaware Geological Survey.

- A) Within Multifamily Residential, Office, Commercial, Industrial, Transportation/Utility, Institutional Uses - Development of these uses within the environs of Middletown may occur provided the impervious cover of the parcel within the recharge area is 50% or less or as dictated under Appendix A of the Town Code for maximum lot coverage (whichever is most stringent). In situations where the existing impervious cover of

a property is over 50% and the applicant desires to re-develop the property, the gross impervious cover shall be equal to or less than the original impervious cover percentage of the original site. In areas zoned as either Commercial (C) or Industrial (I) within Middletown the applicant can seek relief by submitting an environmental study and report certified by a state registered professional geologist or professional engineer with a background in hydrogeology that indicates that additional development would not endanger the public or the environment.

- B) Single Family Residential Uses - New development within the environs of Middletown may occur provided the impervious cover of the entire parcel within the recharge area is 25% or less unless an environmental impact assessment report certified by a state registered professional geologist or professional engineer with a background in hydrogeology indicates that additional development would not endanger the public or the environment.
- C) No underground storage tanks containing petroleum products or any chemicals listed in 40 CFR 116 in an aggregate quantity equal to or greater than as defined in 40 CFR 117 shall be permitted in a recharge area.
- D) For all new construction, all structures shall be required to discharge roof drains into underground recharge systems. No discharge by roof drains to impervious surfaces is permitted in recharge areas.

Section 1112 Boundary Determination for WRPA.

- A) All subdivision and land development plans depicting development or land disturbance submitted for Town review shall be evaluated for the existence of water resource protection areas by scaling for distances shown on the water resource protection area map. If existing, the boundaries of the areas shall be delineated on the plan by the applicant's engineer.
- B) When there appears to be a conflict between the mapped boundary and actual site conditions, the applicant may engage the services of professional practitioners set forth in this section to prepare a report intended to determine more accurately the precise boundary of the water resource protection area, which report shall be submitted to the Town with the detailed findings necessary to indicate the location of the boundary.
- C) The plan showing the boundary conflict should indicate the following:
 - 1) A detailed topographic layout of the subdivision and/or area to be developed prepared by a land surveyor or engineer.
 - 2) For floodplain and erosion-prone slopes boundary determinations, a revised surface soils map of the subdivision and/or area prepared by a DNREC-licensed soil scientist including a written report of the on-site field inspection and test boring data;
 - 3) For reservoir watershed, wellhead and recharge boundary determinations, a site-specific geological and hydro-geological analysis shall be performed by a state-registered professional geologist or engineer with a background in hydro-geology and shall be based upon through site investigation and testing; and
 - 4) Evidence derived from a site-specific investigation which may include aquifer testing, test borings, test pits, observation wells, groundwater elevations and topography surveys as appropriate for the type of water resource protection area to clearly demonstrate that the area in question does not meet the definition of a water resource protection area as defined in this section.
- D) The applicant is permitted to make a submission to the County with the advice of the Delaware Geological Survey and the Water Resources Agency, to adjust the boundary or area designation based thereon. Such adjustments shall have the effect of exempting the subject parcel from the use regulations of this section and shall have the effect of amending the limits of the water resource protection area. The applicant will then be required to provide a notification sent by the County indicating that they concur with the amended boundary location in order to be exempted from the requirements of this section.

Section 1113 Uniform Standards and Criteria.

- A) The following standards and criteria shall be applicable to any limited use, special use or other use requiring an environmental impact assessment permitted pursuant to this Division:
 - 1) Stormwater management facilities shall be designed and constructed in accordance with DNREC "Delaware Sediment and Stormwater Regulations," dated January 23, 1991 or as later revised.

Section 1114 Environmental Impact Assessment Report.

New development in WRPAs may exceed the 25% impervious cover threshold for residential development within WRPAs, but be no more than 50% impervious, provided the applicant submits an environmental assessment recommending a climatic water budget and facilities to augment recharge. The environmental assessment must document that post-development recharge will be no less than predevelopment recharge when computed on an annual basis. Commonly, the applicant offsets the loss of recharge due to impervious cover by constructing recharge basins that convey relatively pure rooftop runoff for infiltration to ground water. Refer to the included Supplement 1 entitled “Ground-Water Recharge Design Methodology” for the details of how to design recharge facilities in Delaware water resource protection areas.

- A) If a proposed use requires an environmental impact assessment report, the applicant shall have such a report certified by a professional engineer, geologist or other certified professional in the applicable environmental discipline. Mitigation cannot be used where the conflict can be avoided or minimized. The report shall contain the following criteria, given in order of preference:
- 1) Site character. The report shall identify all potential on-site sensitive environmental concerns.
 - 2) Avoidance. Alternative sites or routes shall be identified that would not damage the resource or result in less resource damage. Reasons shall be provided explaining why using these sites is impossible or infeasible versus that proposed.
 - 3) Minimization. The applicant shall demonstrate that the plan minimizes the impact of the activity, route, or use on the resource. The applicant shall also demonstrate that the areas impacted shall be lowest quality and result in the least damage to the resource.
 - 4) Mitigation. A mitigation plan shall be submitted indicating mitigation activities. On-site replacement is the most acceptable form of mitigation. However, mitigation can include restoration and enhancement after the use is abandoned. Mitigation by replacement on another site shall be at a ratio of two to one (2:1). Mitigation may also include enhancement; this ratio shall be four to one (4:1). Final Town approval is required for all other forms of mitigation not consistent with this section.

Section 1115 Clearing.

All natural resources. Clearing shall be permitted only under the following conditions:

- A) To prepare land for a use permitted by this Chapter; or
- B) As a reforestation measure, or to enhance to improve the quality of existing vegetation or as a means to eliminate dead, diseased, or hazardous tree stands.
- C) Where a clearcutting operation is deemed permissible for one of the reasons stated in this subsection, it shall be consistent with the terms of Section 1116 and in accordance with the State Department of Agriculture Division of Forest Services.

Section 1116 Reforestation Requirements.

All open spaces to be reforested shall be planted according to the plant species listed in Table 11-16. The area around each tree shall be mulched. The entire area may be mulched or seeded in a perennial grass mix with a minimum thirty (30) percent indigenous herbaceous forest, or grassland species. Canopy trees shall be selected to provide a diversity of native plants. Plantings shall include a minimum of four (4) species. Where more than one hundred (100) canopy trees are required, a minimum of six (6) species shall be provided; no one species shall have less than five (5) or more than thirty (30) percent of the total trees.

1. Protected resources shall not be disturbed with roadways, parking lots or utility lines. The applicant must demonstrate no possible alternative to crossing the resource exists and the route selected must be the least disruptive.
2. Riparian buffer areas. Stormwater outfall shall be permitted, provided that the discharge velocity from the terminal end of the pipe or the associated energy dissipation practice does not exceed two (2) feet per second (fps) for the two (2) year frequency storm event. In addition, best management practices methods shall be used to convert concentrated flow to uniform, shallow sheet flow, filter sediments, and control erosion.

Table 11-16. Reforestation Requirements Per Acre.

No. of Plants	Types of Plants
1	4" caliper canopy
4	3" caliper canopy
10	1- 1/2" caliper canopy
6	1-1/2 " caliper or 5-6 ft. understory trees
50	6' whip canopy
30	bare root shrubs or 1 gallon pots

Section 1117 Roads, Parking Lots and Utilities.

- A) Protected resources shall not be disturbed with roadways, parking lots or utility lines. The applicant must demonstrate no possible alternate to crossing the resource exists and the route selected must be the least disruptive.
- B) Riparian buffer areas. Stormwater outfall shall be permitted, provided that the discharge velocity from the terminal end of the pipe or the associated energy dissipation practice does not exceed two (2) feet per second (fps) for the two (2) year frequency storm event. In addition, best management practice methods shall be used to convert concentrated flow to uniform, shallow sheet flow, filter sediments, and control erosion.

Appendix D

Draft Model Ordinance for Smaller Municipalities

WATER RESOURCE PROTECTION AREA AND ENVIRONMENTAL PROTECTION REGULATIONS

(DRAFT March 2004)

Section 1100 Intent.

The intent of this section is to provide clarification on the environmental constraints and requirements for development in environmentally sensitive areas.

Section 1101 Definitions.

This section defines words, terms, and phrases found in this article.

Applicant. A person, firm or government agency that executes the necessary forms to obtain approval or a permit for any zoning, subdivision, land development, building, land disturbance, or other activity regulated.

Aquifer. A body of rock (crystalline, sand or gravel) that contains sufficient saturated permeable material to conduct groundwater springs or to yield economically significant quantities of groundwater to wells.

Drainage. The process by which surface water (usually from rainfall) moves across the land surface. See *Stormwater Management*.

Drainage Areas. The delineated areas that currently contribute or are proposed to contribute runoff to a specific location or point.

Groundwater. A portion of the subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Public Water Supply Well. A well from which the water is used to serve a community water system by section 22.146 (Public Water Systems) in the Delaware state Regulations Governing Public Drinking water Systems.

Recharge Areas. The recharge water resource protection areas are designated as having the best potential for groundwater recharge.

Runoff. That portion of precipitation or snow melt that has not evaporated or infiltrated into the soil, but flows on land surface.

Stormwater Management. The mitigation of the hydrologic impacts of lost natural runoff storage by the use of constructed storage facilities.

- A) For water quantity control, a system of vegetative, structural, and other measures that may control the volume and rate of stormwater runoff which may be caused by land disturbing activities or activities upon the land; and
- B) For water quality control, a system of vegetative, structural, and other measures that control adverse effects on water quality that may be caused by land disturbing activities or activities upon the land.

Water Resource Protection Area. Water resource protection areas are Wellhead and Recharge areas.

Wellhead. The wellhead water resource protection areas are surface and subsurface areas surrounding public water supply wells or wellfields where the quantity or quality of groundwater moving toward such wells or wellfields may be adversely affected by land use activity. Such activity may result in a reduction of recharge or may lead to introduction of contaminants to groundwater used for public supply ("wellhead").

Section 1102 Water Resources Protection Areas (WRPA).

Water resource protection areas are Wellhead and Recharge Areas. All such areas are as depicted on Water Resource Protection Area maps located in Town Hall. These areas shall be protected as required by the following sections to protect the Town's public drinking water resources from contamination and pollution.

Section 1103 Wellheads Class A.

- A) Areas within three hundred (300) feet of the well shall be one hundred (100) percent open space.
- B) The natural runoff flowing into wellhead areas shall be allowed and all new stormwater run-off shall be diverted around the wellhead protection areas wherever practical.
- C) The stormwater system's discharge to wellhead WRPAs shall be by sheet through a grassland or discharge from a stormwater management facility having a wetland or aquatic bench. Stormwater runoff from all parking areas shall be directed to a stormwater management facility before it is discharged into a wellhead WRPA.
- D) Within the wellhead area, impervious surfaces shall be limited to the buildings and access associated with the well and distribution and treatment facilities and their maintenance
- E) The minimum lot area for a proposed public water supply well and related facility drawing from a confined aquifer shall be 1 acre and the minimum lot area for a public well drawing from an unconfined aquifer shall be 2 acres.
- F) Underground storage tanks containing petroleum or any hazardous substances listed in 40 CFR 116 in an aggregate quantity equal to or greater than a reportable quantity as defined in 40 CFR 117 shall not be permitted in a designated wellhead area.

Or

Underground storage tanks containing petroleum or any hazardous substances listed in 40 CFR 116 in an aggregate quantity equal to or greater than a reportable quantity as defined in 40 CFR 117 may be constructed in a designated wellhead area provided the UST's are constructed with double containment in accordance with the Delaware Standards for Underground Storage Tanks.

- G) Septic systems may be permitted in wellhead areas provided:
 - 1) The minimum residential lot density is 2 acres per dwelling.
 - 2) The minimum soil permeability is 1 inch per hour.
 - 3) The depth to seasonal high groundwater table is more than 5 feet.
- H) Hazardous Waste Storage, Treatment, and Disposal Facilities, and Sanitary and Industrial Facilities as defined in *the Delaware Regulations Governing Hazardous Waste* shall not be permitted in wellhead areas.

Section 1104 Recharge Areas.

Recharge Areas are those areas with high percentages of sand and gravel that have "excellent" potential for recharge as determined through a Stack Unit Mapping Analysis performed originally by the Delaware Geological Survey.

- A) Within Multifamily Residential, Office, Commercial, Industrial, Transportation/Utility, Institutional Uses - Development of these uses within the Town of _____ may occur provided the impervious cover of the parcel within the recharge area is 20% or less unless an environmental impact assessment report certified by a state registered professional geologist or professional engineer with a background in hydrogeology indicates that additional development would not endanger the public or the environment. In situations where the existing impervious cover of a property is over 50% and the applicant desires to re-develop the property, the gross impervious cover shall be equal to or less than the original impervious cover percentage of the original site. In areas zoned as either Commercial (C) or Industrial (I) within the Town of _____ the applicant can seek relief by submitting an environmental study and report certified by a state registered professional geologist or professional engineer with a background in hydrogeology that indicates that additional development would not endanger the public or the environment.
- B) Single Family Residential Uses - New development within the Town of _____ may occur provided the impervious cover of the entire parcel within the recharge area is 20% or less unless an environmental impact assessment report certified by a state registered professional geologist or professional engineer with

a background in hydrogeology indicates that additional development would not endanger the public or the environment.

- C) Underground storage tanks containing petroleum products or any hazardous substances listed in 40 CFR 116 in an aggregate quantity equal to or greater than a reportable quantity as defined in 40 CFR 117 shall not be permitted in a designated recharge area.

Or

Underground storage tanks containing petroleum or any hazardous substances listed in 40 CFR 116 in an aggregate quantity equal to or greater than a reportable quantity as defined in 40 CFR 117 may be constructed in a designated recharge area provided the UST are constructed with double containment in accordance with the Delaware Standards for Underground Storage Tanks.

- D) For all new construction, all structures shall be required to discharge roof drains into underground recharge systems or permeable surfaces. No discharge by roof drains to impervious surfaces is permitted in recharge areas.
- E) Septic systems may be permitted in recharge areas provided:
 - 1) The minimum residential lot density is 2 acres per dwelling.
 - 2) The minimum soil permeability is 1 inch per hour.
 - 3) The depth to seasonal high groundwater table is more than 5 feet.
- F) Hazardous Waste Storage, Treatment, and Disposal Facilities, and Sanitary and Industrial Facilities as defined in *the Delaware Regulations Governing Hazardous Waste* shall not be permitted in wellhead areas.

Section 1105 Boundary Determination for WRPA.

- A) All subdivision and land development plans depicting development or land disturbance submitted for Town review shall be evaluated for the existence of water resource protection areas by scaling for distances shown on the Town of _____ Water Resource Protection Area Map. If existing, the boundaries of the areas shall be delineated on the plan by the applicant's engineer.
- B) When there appears to be a conflict between the mapped boundary and actual site conditions, the applicant may engage the services of professional practitioners set forth in this section to prepare a report intended to determine more accurately the precise boundary of the water resource protection area, which report shall be submitted to the Town with the detailed findings necessary to indicate the location of the boundary.
- C) The plan showing the boundary conflict should indicate the following:
 - 1) A detailed topographic layout of the subdivision and/or area to be developed prepared by a land surveyor or engineer.
 - 2) For wellhead and recharge boundary determinations, a site-specific geological and hydro-geological analysis shall be performed by a state-registered professional geologist or engineer with a background in hydro-geology and shall be based upon through site investigation and testing; and
 - 3) Evidence derived from a site-specific investigation which may include aquifer testing, test borings, test pits, observation wells, groundwater elevations and topography surveys as appropriate for the type of water resource protection area to clearly demonstrate that the area in question does not meet the definition of a water resource protection area as defined in Section 1101.
- D) The applicant is permitted to make a submission to the Town with the written approval of the Delaware Geological Survey, the University of Delaware Water Resources Agency, and the Department of Natural Resources and Environmental Control, to adjust the boundary or area designation based thereon. Such adjustments shall have the effect of exempting the subject parcel from the use regulations of this section and shall have the effect of amending the limits of the water resource protection area. The applicant will then be required to provide a notification sent to the Town indicating that they concur with the amended boundary location in order to be exempted from the requirements of this section.

Section 1106 Uniform Standards and Criteria.

- A) The following standards and criteria shall be applicable to any limited use, special use or other use requiring an environmental impact assessment permitted pursuant to this Division:
- 1) Stormwater management facilities shall be designed and constructed in accordance with DNREC "Delaware Sediment and Stormwater Regulations," dated January 23, 1991 or as later revised.

Section 1107 Environmental Impact Assessment Report.

New development in WRPA's may exceed the 20% impervious cover threshold within recharge WRPA's, but be no more than 50% impervious, provided the applicant submits an environmental assessment recommending a climatic water budget and facilities to augment recharge. The environmental assessment must document that post-development recharge will be no less than predevelopment recharge when computed on an annual basis. Commonly, the applicant offsets the loss of recharge due to impervious cover by constructing recharge basins that convey relatively pure rooftop runoff for infiltration to ground water. Refer to Supplement 1 entitled "Ground-Water Recharge Design Methodology" for the details of how to design recharge facilities in Delaware water resource protection areas.

- A) If a proposed use requires an environmental impact assessment report, the applicant shall have such a report certified by a professional engineer, geologist or other certified professional in the applicable environmental discipline. Mitigation cannot be used where the conflict can be avoided or minimized. The report shall contain the following criteria, given in order of preference:
- 1) Site character. The report shall identify all potential on-site sensitive environmental concerns.
 - 2) Avoidance. Alternative sites or routes shall be identified that would not damage the resource or result in less resource damage. Reasons shall be provided explaining why using these sites is impossible or infeasible versus that proposed.
 - 3) Minimization. The applicant shall demonstrate that the plan minimizes the impact of the activity, route, or use on the resource. The applicant shall also demonstrate that the areas impacted shall be lowest quality and result in the least damage to the resource.
 - 4) Mitigation. A mitigation plan shall be submitted indicating mitigation activities. On-site replacement is the most acceptable form of mitigation. However, mitigation can include restoration and enhancement after the use is abandoned. Mitigation by replacement on another site shall be at a ratio of two to one (2:1). Mitigation may also include enhancement; this ratio shall be four to one (4:1). Final Town approval is required for all other forms of mitigation not consistent with this section.

Appendix E

Chapter 40 Article 10 New Castle County Unified Development Code

Chapter 40: Article 10: Environmental Standards

DIVISION 40.10.000 PURPOSE

This Article establishes the basic performance standards to protect natural resources. Developments are required to conduct a carrying capacity analysis (Article 05) which regulates the maximum intensity based on actual site conditions. The site carrying capacity analysis ensures that public health, safety, general welfare and quality of life is protected and preserved for future generations. This Article establishes the protection standards used in Article 05 and sets additional standards for activities in areas of natural resources or the mitigation of resource areas that are disturbed.

DIVISION 40.10.100 RESOURCE PROTECTION STANDARDS

SECTION 40.10.110 RESOURCE PROTECTION STANDARDS

- A) The protection of natural resources is achieved in three (3) ways. First, specific open space standards are proposed to protect each natural resource by insuring that some portion of the area remains undisturbed. Secondly, site capacity calculation (Article 05) is provided to regulate development of sites to which is consistent with the level of protection. Lastly, specific use, protection, and mitigation standards are provided for each resource.
- B) Natural resources are protected by requiring the preservation of a minimum amount of the resource as open space. Such open space shall be part of the open space ratio in residential developments and part of the landscape surface ratio in non-residential developments. Unless otherwise permitted in this Article or Table 40.10.210, the open space shall remain undisturbed. Resource protection levels are specified in Table 40.10.010 and must be met within any development. The development intensity may be modified by the site capacity calculations in Division 40.05.100. Natural resource definitions are described in Division 40.33.300.

DIVISION 40.10.300 ADDITIONAL RESOURCE STANDARDS

The following Sections set forth additional standards that protect natural resources or permit mitigation.

SECTION 40.10.310 FLOODPLAINS AND FLOODWAYS

- A) **Boundary interpretation.** Where there appears to be a conflict between a mapped boundary and actual field conditions, a determination of the exact boundary of the area subject to inundation by the base flood shall be made by the Department using the one hundred (100) year flood elevation information provided in the flood insurance study for the flood fringe portions of the floodplain and using the best one hundred (100) year floodplain elevation information available for general floodplain areas. For the floodway portion of the floodplain the exact boundaries shall be determined by scaling the distances shown on the floodway map and by utilizing the data in Table 3 of the flood insurance study for the County. Where the boundary of the floodplain is disputed, the burden of proof shall be on the applicant.
- B) There are two (2) areas within the floodplain, the floodway and the flood fringe.
 - 1) No structure shall intrude into the floodway except for piers needed to support bridges, erosion control structures, dams for flood control or water supply, and utility crossings.
 - 2) Only structures essential to the permitted uses (Table 40.03.110) shall be permitted in the floodplain. Roads and other essential crossings shall be located to minimize the impact on natural resources.
 - 3) No structures designed for human habitation are permitted except:
 - a) Where approved under the beneficial use provisions of Section 40.10.315 and
 - b) Division 40.31.600.
 - c) Nonconforming uses that already exist in the floodplain (see 40.10.311).
 - 4) Structures shall be constructed and placed on the building site so as to cause an increase of less than one-tenth (0.10) foot in flood height off site and offer no obstruction to the flow of flood waters. All piers in the floodways should have sufficient clearance between flood elevation and any horizontal portions of the bridge to avoid debris jams. The Department shall approve all such crossings.
 - 5) Structures shall be firmly anchored to prevent them from floating away or collapsing. Structures shall be certified by a professional engineer to withstand velocities and likely debris loadings at that point in the floodplain.
 - 6) Where approved, development shall meet the following standards:

- a) Construction materials shall be resistant to flood damage.
- b) All electrical, heating, ventilation, plumbing, air-conditioning equipment, and other service facilities shall be designed and located at least one (1) foot above the one hundred (100) year floodplain so as to prevent water from entering or accumulating within the components during conditions of flooding.
- c) New or replacement water supply systems and/or sanitary sewage systems or
- d) Other utilities shall be designed to minimize or eliminate infiltration of flood
- e) Waters into the systems and discharges from the systems into flood waters. On-site waste disposal systems shall be located so as to avoid impairment or
- f) Contamination and flooding.

SECTION 40.10.311 NONCONFORMING STRUCTURES AND USES IN FLOODPLAIN

Nonconforming structures and uses of land within the floodplain district shall be regulated by the following:

- A) Existing nonconforming buildings, structures or uses located in the floodplain shall not be expanded or enlarged except as permitted in subsection C of this section.
- B) The reconstruction or substantial repair of a nonconforming structure in a floodplain must be authorized and approved by the Department pursuant to the standards specified in Section 40.10.315 of this Article.
- C) Any existing nonconforming building, structure, or use which is proposed to be expanded or enlarged in the flood fringe may be permitted, provided that such expansion or enlargement does not result in an increase to the building or structure footprint (foundation) and has received approval from the Department. The Department's approval shall be conditioned upon the applicant addressing to the satisfaction of the Department all public health, safety or general welfare concerns related to the proposed expansion or enlargement raised by the Department.

SECTION 40.10.312 NONDELINEATED FLOODPLAIN

The subdivision or development of land within and adjacent to nondelineated floodplain areas shall include the submission of a flood study by the applicant to establish the limits of flooding from the one hundred (100) year storm event using one (1) of the following sources as deemed appropriate by the Department. Nondelineated floodplains are subject to all of the regulations and standards in this Article.

- A) One hundred (100) year flood elevations established by the county based on the drainage basin's ultimate development as projected by the Department.
- B) U.S. Department of Agriculture, Soil Survey Manual for New Castle County (1970). Soils considered to be flood hazard soils, including tidal flooding, shall be those shown on Table 7 therein. Questions concerning the boundaries of such soils shall be resolved by the Natural Resources Conservation Service of the U.S. Department of Agriculture. This method shall not be used for delineating a manmade floodplain.
- C) Where the specific one hundred (100) year elevation cannot be determined using the sources established in this subsection, the applicant for the proposed development shall submit his or her suggested determination of this elevation in accordance with accepted hydrologic and hydraulic engineering techniques. Hydrologic and hydraulic analysis shall be undertaken only by a professional engineer who shall certify to the Department that the technical methods used correctly reflect currently accepted technical concepts. Studies, analyses, computations, etc. shall be submitted in sufficient detail to allow a thorough technical review by the Department.
- D) Recorded high water marks from past floods based on historical data, including, but not limited to, photographic documentation and water marks on vegetation or structures.

SECTION 40.10.313 DEVELOPMENT IN FLOODPLAINS

This Chapter is predicated on minimizing building or filling in the floodplain. However it shall be permitted as follows:

- A) Use is permitted in Table 40.10.210. Such uses shall demonstrate they are situated to minimize trapping of debris or any other such condition that reduces flood storage.
- B) Replacement or improvement to a nonconforming structure which already exists in the floodplain (Section 40.10.311).
- C) It is ordered as a beneficial use, after a beneficial use appeal Section 40.31.600.
- D) All uses and development occurring in areas/properties determined to be a Brownfield as demarcated by the Department of Natural Resources and Environmental Control (DNREC), Air and Waste Management Division, are permitted only upon approval of the Department with the consent of County Council by

resolution after an applicant has submitted a certification from the DNREC that the property meets Brownfield criteria. All new construction or substantial improvements to nonresidential structures located in a designated Brownfield area shall meet all of the requirements of Section 40.10.316 except C, (G)(5) and P. Brownfield criteria that must be met include:

- 1) Areas/properties located in targeted census tracts as defined by the Delaware Economic Development Office (DEDO).
 - 2) Areas/properties identified by the DNREC as contaminated by the release or threatened release of a hazardous substance as defined under 7 Del. C., ch. 91.
 - 3) Properties that are zoned either Commercial or Industrial Use, and which meet the DEDO criteria for underutilized.
- E) Substantial improvements to structural buildings associated with a current operational petroleum underground storage tank (UST) facility is permitted, provided the impetus for the owner of said UST facility in upgrading or replacing all or a portion of the UST system is to achieve compliance with the State Regulations Governing Underground Storage Tank Systems as established under 7 Del. C., ch. 74.
- F) All new construction or substantial improvements to nonresidential structures located in a designated Brownfield area must have a floor area elevation equal to or above the base flood elevation or must be flood proofed to the base flood elevation.

SECTION 40.10.314 FILLING IN THE FLOODPLAIN

Where permitted by Section 40.10.313 filling shall adhere to all of the following conditions:

- A) Such fills shall only be permitted in the fringes of the floodplain and are prohibited in the floodway.
- B) Filling shall not be used as a means of increasing the development yield of the site capacity calculation (Division 40.05.400). The original floodplain shall be used in the site capacity calculation, not the smaller floodplain.
- C) The total area of the floodplain on the site may not be reduced by more than ten (10) percent in conjunction with channel improvements, flood storage, and detention that would have the effect of reducing the floodplain elevation.
- D) All filling shall meet the following construction requirements:
 - 1) The fill shall be protected against erosion by riprap, vegetative cover, sheet piling, or bulkheading sufficient to prevent erosion.
 - 2) The fill shall be clean and compacted to minimize erosion potential.
 - 3) Hydraulic openings shall be designed to convey one hundred (100) year flow unimpeded.
 - 4) As a result of filling on the site, there shall be no net loss of flood storage capacity. Compensation shall be made for the volume of fill so that neither cross-sectional area decreases nor flood level increases.
- E) Where filling is proposed the record plan shall not be approved until FEMA certifies a new floodplain limit so that no lots are shown to be in the floodplain.
- F) Where homes existing as of the date of adoption of this Chapter can be protected from existing flooding conditions by filling not exceeding twenty (20) cubic yards per lot, such filling may be permitted by the Department provided all the requirements of subsection D above are met.

SECTION 40.10.315 STANDARDS FOR BENEFICIAL USES IN FLOODPLAINS

All new construction, reconstruction, subdivision proposals, substantial improvements or repairs, prefabricated structures and other developments shall be prohibited except where approved as essential to the beneficial use of property. Approval shall require the issuance of a beneficial use permit. In approving a beneficial use permit, in addition to the standards for beneficial uses in Division 40.31.600, the following standards shall be met:

- A) Storage, material, and equipment:
 - 1) The storage or processing of materials within the special flood hazard area that are in time of flooding buoyant, flammable, explosive, or could be injurious to human, animal, or plant life is prohibited.
 - 2) Storage of other material or equipment may be allowed if not subject to major damage by floods, if firmly anchored to prevent flotation, or if readily removable from the area within the time available after a flood warning.

SECTION 40.10.316 CRITERIA FOR BUILDING IN AND NEAR THE FLOODPLAIN

In reviewing an application, the Department shall consider and/or require the following:

- A) Any development in the floodway that would cause an increase in flood heights in excess of that allowed in Section 40.10.310 B 4 shall be prohibited.
- B) New construction of or substantial improvements to residential structures shall have the lowest floor, including basement, elevated not less than eighteen (18) inches above the one hundred (100) year flood. Additions to residential structures not constituting a substantial improvement shall have the lowest floor, including basement elevated above the one hundred (100) year flood.
- C) New construction of or substantial improvements to nonresidential structures shall have the lowest floor, including basement, elevated not less than eighteen (18) inches above the one hundred (100) year flood or, together with attendant utility and sanitary facilities, shall be floodproofed up to not less than eighteen (18) inches above the level of the one hundred (100) year flood. Such floodproofing shall be watertight, with walls substantially impermeable to the passage of water, and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. Wet floodproofing that allows the free flow of flood waters through the areas of a structure above its lowest floor shall not be permitted. A registered professional engineer or architect shall develop and/or review structural design, specifications, and plans for the construction, and shall certify that the design and methods of construction are in accordance with accepted standards of practice for meeting these provisions.
- D) Electrical, heating, ventilation, plumbing and air conditioning equipment, and other service facilities shall be designed and/or located so as to prevent water from entering or accumulating with the components during conditions of flooding.
- E) For all new construction and substantial improvements, fully enclosed areas below the lowest floor area that are useable solely for parking of vehicles, building access or storage in an area other than a basement and which are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must be certified by a professional engineer with a background in structural design and must meet or exceed the following minimum criteria:
 - 1) A minimum of two (2) openings having a total net area of not less than one (1) square inch for every square foot of enclosed area subject to flooding shall be provided.
 - 2) The bottom of all openings shall be no higher than one foot above grade.
 - 3) Openings may be equipped with screens, louvers or other coverings or devices provided they permit the automatic entry and exit of floodwaters.
- F) All structures, residential and non-residential, shall be:
 - 1) Designed and adequately anchored to prevent flotation, collapse or lateral movement of the structure.
 - 2) Constructed with materials and utility equipment resistant to flood damage.
 - 3) Constructed by methods and practices that minimize flood damage.
- G) If fill is used to raise the finished surface of the lowest floor to the base flood elevation:
 - 1) Fill shall extend beyond a structure for a sufficient distance to provide acceptable access.
 - 2) Fill material shall be compacted to provide the necessary stability and resistance to erosion, scouring and settling.
 - 3) Fill slopes shall be no steeper than one (1) vertical on two (2) horizontal.
 - 4) Fill shall be used only to the extent to which it does not adversely affect adjacent properties.
 - 5) Fill shall not be used for the purpose of enhancing the future development potential of an existing property by creating new lots or land areas for future development that would have been located in the floodplain prior to the placement of the fill material.
- H) The danger to life and property due to increased flood heights or velocities caused by encroachments.
- I) The danger that materials may be swept on to other lands or downstream to the injury of others.
- J) The proposed water supply and sanitation systems and the ability of these systems to avoid causing disease, contamination, and unsanitary conditions.
- K) The expected heights, velocities, duration, and sediment transport of the floodwater expected at the site.
- L) The proposed activity's undue alteration of natural water flows.
- M) No development shall be permitted in floodplain and nondelineated floodplain areas where no floodway has been designated and where one hundred (100) year flood elevations have been provided, unless the applicant demonstrates that the proposed use, when combined with all other existing and anticipated development, will not increase the water surface elevation of the one hundred (100) year flood more than two tenths (0.2) of a foot at any point.
- N) Any permitted development is subject to all applicable state and federal rules and regulations.

- O) Manufactured homes shall be placed on a permanent foundation and shall have the lowest floor elevated not less than eighteen (18) inches above the one hundred (100) year flood level and anchored to resist floatation, collapse or lateral movement.
- P) The extent to which the applicant's primary purpose can be achieved by the use of alternatives or without the use of lands in the floodplain, or the extent to which the applicant can employ mitigation measures to offset adverse impacts, or to which the public at large would benefit from the activity or project and the extent to which it would suffer detriment.
- Q) The susceptibility of the proposed use to flood damage and the effect of such damage on the owner.
- R) The protection of individuals who might choose, despite the flood dangers, to develop or occupy land on the floodplain; or protection of other landowners from damages resulting from the development of a floodplain and the consequent obstruction of the flood flow; or the protection of the entire community from individual choices of land use which requires subsequent public expenditures for public works and disaster relief; or protection of the quality of surface and subsurface water supplies adjacent to and underlying floodplain areas.
- S) The safety of access to the property in times of flood for ordinary and emergency vehicles.
- T) The likelihood that the proposed use will result in extraordinary public expense, will create nuisances or will conflict with existing County ordinances or regulations.

SECTION 40.10.330 RIPARIAN BUFFER AREAS (RBA)

The water body buffers shall meet the following standards which are intended to preserve and enhance existing vegetation and to revegetate disturbed areas.

SECTION 40.10.332 SURFACE WATER BODIES

- A) Non-water-supply water bodies.
 - 1) No septic systems shall be allowed within an RBA.
 - 2) All developments shall maximize the drainage amount conducted in natural swales rather than storm sewers. A stormwater system's discharge to streams or watercourses shall be by sheet flow through a grassland or discharged from a stormwater management facility having a wetland or aquatic bench.
 - 3) Stormwater runoff from all parking areas shall be directed to a stormwater management facility before it is discharged into an RBA.
- B) Public water supply surface storage reservoir.
 - 1) All developments which drain on the surface or underground to existing public water supply reservoirs shall be limited to ten (10) percent impervious coverage. Public water supply reservoirs (or reservoir watersheds) are depicted on the three (3) map series "Water Resource Protection Areas for the City of Newark, City of Wilmington, New Castle County, Delaware", prepared by the Water Resources Agency for New Castle County that is dated 1993, or as may be amended.
 - 2) No septic systems shall be allowed within six hundred (600) feet of the water supply surface storage reservoir.
 - 3) All developments shall maximize the drainage amount conducted in natural swales rather than storm sewers. A stormwater system's discharge to streams or watercourses shall be by sheet flow through a grassland or discharged from a stormwater management facility having a wetland or aquatic bench.
 - 4) No industrial or commercial parking shall be permitted within three hundred (300) feet of the public water supply surface storage reservoir.

SECTION 40.10.340 STEEP SLOPES

- A) Public purpose. The public purpose of this Section is to protect the public health, safety and welfare. To this end, this Section is intended to protect the environment through the preservation of natural resources and to complement the sections relating to open space. This Section is designed to encourage the sensitive treatment of hillsides and their related soil and vegetation resources in an effort to minimize adverse environmental impacts. The following objectives serve to complement these specific purposes and the overall purposes of this Section, and the objectives shall be to:
 - 1) Conserve and protect steep slopes from inappropriate development, such as excessive grading, land form alteration and extensive vegetation removal.

- 2) Avoid potential hazards to property and the disruption of ecological balance which may be caused by increased runoff, flooding, soil erosion and sedimentation, blasting and ripping of rock and landslide and soil failure.
 - 3) Encourage the use of steep slopes for open space and other uses which are compatible with the preservation of natural resources and protection of areas of environmental concern.
 - 4) Avoid public expenses of repair and restoration of damage to downhill sites caused by the improper development of steep slopes.
- B) Standards and criteria.
- The following practices shall be required when developing in a precautionary steep slope area:
- 1) All grading shall be minimized, and no grading shall be undertaken within any area of the steep slope area except where approved.
 - 2) Disturbance of steep slopes must consider unique characteristics of topographic, soil and vegetation resources and the techniques proposed to mitigate potential adverse environmental impacts.
 - 3) The effect the development of the steep slope would have on adjacent properties.
 - 4) The compatibility of the proposed uses with public purposes.
 - 5) No other alternative location within the subdivision being considered is feasible or practical.
 - 6) Earth-moving activities and vegetation removal will be conducted only to the extent necessary to accommodate proposed uses and structures and in a manner that will not cause excessive surface water runoff, erosion, sedimentation or unstable soil conditions.
 - 7) Mitigation techniques will be utilized, including but not limited to retaining walls, tree wells, the establishment of ground covers and/or low spreading shrubs, the use of erosion control fabric and the like.
 - 8) The proposed buildings or structures shall be of sound engineering design. Footings shall be designed in response to the site's slope, soil and bedrock characteristics.
 - 9) Disturbance to particularly sensitive features of the site shall be minimized; special emphasis in planning for the site should be given to the protection of:
 - a) Soils with seasonal high water table, as listed in Appendix I, Table C of Chapter 12 of this Code pertaining to drainage.
 - b) Underlying geology which comprises or contributes to a major groundwater resource including the flow of existing springs.
 - 10) Disturbance shall be minimized where the length of area of steep slope, both on the site and on adjacent lands within two hundred (200) feet of the site, is extensive.
 - 11) The proposed development, any impervious ground cover and the resultant disturbance to the land and existing vegetative cover will not cause runoff and/or related environmental problems off the site.
 - 12) Removal of or disturbance to existing vegetation on the site shall be minimized. The proposed impacts on existing vegetation shall be evaluated in terms of the potentially detrimental effects on slope stability, recharge of stormwater and existing drainage patterns.
 - 13) Road construction shall follow the natural topography, with cuts and grading minimized; the location of any proposed point of access to an activity or use on the lot shall reflect the need to avoid steep slope disturbances.
- C) In a prohibitive steep slope area, roads and driveways shall only be permitted if no viable alternative alignment or location is feasible provided that such roads and driveways are aligned predominately parallel to the contours as demonstrated by an environmental impact assessment report.
- D) Permits shall require all earth work to be conducted so as to be concluded one (1) month prior to the end of the planting seasons (i.e., April 30 and September 30). This practice will enable a ground cover to be established after work completion.
- E) A ground cover shall be placed on all exposed surfaces prior to the end of the planting season, or as the work is completed prior to that date. The Department is authorized to permit temporary cover in limited situations where unusual weather or the type of project requires earth work beyond a planting season. Surety may be required for remedial work if temporary cover is to be used.
- F) All slopes exceeding fifteen (15) percent or where water flows can be anticipated shall have a protective cover to hold the seed or plants in place. All protective covers shall be approved by the Department.
- G) All plant materials should be approved by the Department as suitable for the area's soils and exposure, growth, and coverage rate.

DIVISION 40.10.380 WATER RESOURCES PROTECTION AREAS (WRPA)

- A) Water resource protection areas are the Cockeyville Formation, Cockeyville Formation Drainage Area, wellheads, and recharge areas. All such areas are as depicted on the three (3) map series “Water Resource Protections Areas for the City of Newark, City of Wilmington, New Castle County, Delaware,” prepared by the Water Resources Agency for New Castle County that is dated 1993, or as amended. These areas shall be protected as required by the following sections to protect the County’s water resources from contamination and pollution and to insure adequate water quantity for future needs.
- B) No development shall be permitted to have more than twenty (20) percent impervious surface ratio unless an environmental impact assessment report certified by a state registered professional geologist or professional engineer with a background in hydrogeology indicates that additional development would not endanger the public or the environment. All environmental impact assessment reports performed pursuant to this Section shall be reviewed in accordance with Section 10.385 and the procedures set forth in Article 30 and Article 31 for environmental impact assessment reports. The impervious surface ratio and open space ratio operate independently and are based on the base site area.
- C) The Department may permit the redevelopment of existing nonconforming sites within Water Resource Protection Areas, which exceed the twenty (20) percent impervious cover standard, provided the proposed redevelopment of the site will reduce the existing impervious cover by a minimum of five (5) percent for sites of two (2) acres or less, a minimum of ten (10) percent for sites greater than two (2) acres and less than five (5) acres, and a minimum of twenty (20) percent for sites greater than five (5) acres and larger.

SECTION 40.10.381 COCKEYSVILLE FORMATION

Special on-site investigation as required by Section 40.22.110.

- A) The County shall require a subsurface investigation report on the stability of the rock formation and likely contamination risks.
- B) In addition, surface drainage shall be designed to prevent infiltration that could lead to increased erosion of supporting rock. The County may require lined channels or stormwater pipes that decrease the level of infiltration to the groundwater.
- C) In determining whether development may be permitted beyond the twenty (20) percent impervious surface ratio limitation of this Division, the contribution of like land by the applicant to be preserved in the Cockeyville Formation shall be considered as a factor in the environmental study and report.

SECTION 40.10.383 WELLHEAD PROTECTION AREAS (PUBLIC WATER SUPPLY WELLS)

- A) Wellhead protection areas.
 - 1) Type A wellhead areas shall be one hundred (100) percent open space within three hundred (300) feet of the wellhead. Within that area, impervious surface shall be limited to building and access associated with the well and distribution and treatment facilities and their maintenance. In the case where the three hundred (300) foot required open space cannot be attained on the same lot as the wellhead, a conservation easement on one or more adjacent lots shall be necessary.
 - 2) Type B and C wellhead areas shall be limited to twenty (20) percent impervious surface ratio within three hundred (300) feet of the wellhead.
- B) The resource protection area around a public water supply well which draws from a confined aquifer as interpreted by the Delaware Geological Survey (DGS), DNREC, or a state registered professional geologist with approval by DGS and DNREC shall be one hundred and fifty (150) feet. The protection area around a well not interpreted as drawing from a confined aquifer may be reduced below three hundred (300) feet where an environmental impact assessment report is approved demonstrating that a minimum sixty (60) day time of travel from a potential contaminant to the public water supply well is maintained. In no case shall the protection area for unconfined aquifers be less than one hundred fifty (150) feet. The assessment reports shall be based on an on-site hydrogeologic study. Notwithstanding any other provisions in Article 13 of the New Castle County Code, the minimum lot area required for a public water supply well and related facility drawing from a confined aquifer shall be one (1) acre; and, the minimum lot area required for a public water supply well and related facility drawing from an unconfined aquifer shall be two (2) acres. In the case where the minimum lot area cannot be met, because the public water supply well and related facility is proposed on an existing lot less than the minimum required, and where the total wellhead protection area required is not wholly owned by the public water utility, a conservation easement on one or more adjacent properties shall be necessary to satisfy the appropriate public water supply well minimum wellhead protection areas. The terms of the conservation easement shall prohibit any activity detrimental to

the public water supply well. The owner of the public water supply well shall be responsible for monitoring the property pursuant to the terms of the easement.

- C) The natural runoff flowing into wellhead areas shall be allowed and all new stormwater runoff shall be diverted around the wellhead protection areas wherever practical.
- D) A stormwater system's discharge to wellhead WRPAs shall be by sheet flow through a grassland or discharged from a stormwater management facility having a wetland or aquatic bench. Stormwater runoff from all parking areas shall be directed to a stormwater management facility before it is discharged into a wellhead WRPA.
- E) The replacement of any existing public water supply well that was not required to meet this wellhead protection requirement at the date of its original installation and that has failed, shall be exempt from meeting this wellhead protection requirement.

SECTION 40.10.384 RECHARGE AREAS AND COCKEYSVILLE FORMATION DRAINAGE AREAS

- A) When impervious cover is proposed by the applicant at a rate greater than twenty (20) percent of the site, the applicant shall be required to demonstrate that the quality of storm water runoff is equal to or greater than predevelopment conditions and the quantity of stormwater runoff is equal to or less than predevelopment conditions.
- B) Those areas of open space not currently forested, shall have a minimum of twenty-five (25) percent of their area reforested pursuant to Section 40.10.351. The Department may reduce this requirement where the applicant prepares an Environmental Impact Assessment Report demonstrating to the satisfaction of the Department that reforestation will result in more than a twenty (20) percent loss in groundwater recharge due to the soils and hydrogeologic conditions of the site. The report shall include an annual water budget compiled on a month by month basis comparing existing and post-development mature forest conditions. Applicants shall submit information regarding the types of trees evaluated, soil conditions (including percolation rates), pH types, assumptions regarding rainfall events, and topography. The report shall also include a water quality analysis comparing the water quality benefits of mature forest cover to the proposed alternative ground cover.

SECTION 40.10.385 UNIFORM STANDARDS AND CRITERIA

- A) The following standards and criteria shall be applicable to any limited use, special use or other use requiring an environmental impact assessment permitted pursuant to this Division:
 - 1) Stormwater management facilities shall be designed and constructed in accordance with DNREC "Delaware Sediment and Stormwater Regulations," dated January 23, 1991 or as later revised.
 - 2) With the exception of floodplain and erosion-prone slope water resource protection areas, stormwater management and recharge facilities shall be designed with the goal of maintaining the quantity and quality of groundwater recharge at predevelopment levels. To facilitate the design of recharge facilities, a manual of best management practices for the design, construction and maintenance of recharge structures shall be developed. The manual shall be approved by the resource protection area technical advisory committee (RPATAC) and may be revised as necessary to reflect advances in recharge technology.
 - 3) In order to establish the predevelopment standards required by subsection (A)(2) of this Section, a study shall be prepared under the supervision of a state-registered professional geologist or professional engineer with a background in hydrogeology. The report of the study shall be submitted to the Department, the Delaware Geological Survey and the Water Resources Agency and shall be reviewed in accordance with the procedures set forth in Article 30 for environmental impact reports.
 - 4) In wellhead water resource protection areas all development shall be maintained at a minimum sixty (60) day horizontal time of travel from any public water supply well as established by the on-site hydrogeologic study required by subsection (A)(3) of this Section or three hundred (300) feet from the public water supply well, whichever is less.
 - 5) When facilities are proposed to augment groundwater recharge, to ensure that the quality of groundwater recharge shall be maintained, a groundwater quality monitoring program shall be established as part of the report prepared pursuant to subsection (A)(3) of this Section. The program shall establish the number of wells to be installed, as well as the duration and frequency regarding the monitoring of the wells to be installed. The wells shall be installed and secured in accordance with DNREC "State of Delaware Regulations Governing the Construction of Water

Wells." All laboratory test results shall be submitted to the Water Resources Agency to ensure the County that satisfactory water quality is maintained.

- 6) Provisions for the maintenance of groundwater recharge facilities and the frequency of groundwater quality testing and monitoring shall be established by a water management agreement between the property owner and the county. The agreement shall not be amended without the approval of the County.
- 7) In water resource protection areas, sanitary sewer systems which utilize land application of treated effluent shall be required to use extended aeration and disinfection. Treated wastewater shall not be applied to the ground at a rate that saturates soils. Crops or vegetation to which treated wastewater is applied shall be harvested periodically to prevent a build-up of metals or other constituents in the soil or groundwater.

SECTION 40.10.386 BOUNDARY DETERMINATION

- A) All subdivision and land development plans depicting development or land disturbance submitted for County review shall be evaluated for the existence of water resource protection areas by scaling the distances shown on the water resource protection area map. If existing, the boundaries of the areas shall be delineated on the plan.
- B) When there appears to be a conflict between the mapped boundary and actual site conditions, the applicant may engage the services of professional practitioners set forth in this Section to prepare a report intended to determine more accurately the precise boundary of the water resource protection area, which report shall be submitted to the Department with the detailed findings necessary to indicate the location of the boundary in conformance with the definitions given in Article 33, including:
 - 1) A detailed topographic layout of the subdivision and/or area to be developed and prepared by a State-registered professional land surveyor or professional engineer;
 - 2) For floodplain and erosion-prone slopes boundary determinations, a revised surface soils map of the subdivision and/or area prepared by a DNREC-licensed soil scientist including a written report of the on-site field inspection and test boring data;
 - 3) For reservoir watershed, Cockeyville formation, wellhead and recharge boundary determinations, a site-specific geological and hydrogeological analysis shall be performed by a State-registered professional geologist or professional engineer with a background in hydrogeology and shall be based upon thorough site investigation, subsurface testing and other testing as may be determined appropriate by the Department; and
 - 4) Evidence derived from a site-specific investigation which may include aquifer testing, test borings, test pits, observation wells, groundwater elevations and topography surveys as appropriate for the type of water resource protection area to clearly demonstrate that the area in question does not meet the definition of a water resource protection area as defined in this Division.
- C) Reserved.
- D) The Department, with the advice of the Delaware Geological Survey and the Water Resources Agency, may adjust the boundary or area designation based thereon. Such adjustments shall have the effect of exempting the subject parcel from the use regulations of this Chapter and shall have the effect of amending the limits of the water resource protection area. However, when the water resource protection area map is updated or amended, the Department shall review each of the exemptions approved since the last map revision to determine if a district boundary should be amended to reflect the findings of the geologic analysis performed at the time of the exemption.
- E) Notwithstanding any other section of this Chapter, if an owner initiates a precise boundary delineation pursuant to this section, any and all time review limitations shall be stayed pending the submission of the report contemplated by this section. Following submission of the report, the Department shall have twenty (20) days to finally approve or disapprove the exploratory sketch plan submission or such further time as deemed necessary by the Department, but not to exceed an additional twenty (20) days.

SECTION 40.10.387 RESOURCE PROTECTION AREA TECHNICAL ADVISORY COMMITTEE (RPATAC)

- A) The purposes and duties of the RPATAC are to:
 - 1) Provide technical support and recommendations to the Department concerning the technical definition and criteria of any resource protection area as depicted on the three (3) map series designated in this Chapter.

- 2) Advise the Department when it is determined that performance standards should be amended.
- 3) Provide technical support and recommendations to the Board of Adjustment and Planning Board concerning any application.
- 4) Advise the Department when it is determined that this Chapter should be amended.
- 5) Assist the Department as requested.

SECTION 40.10.388 RPATAC REVIEW

Neither the Board of Adjustment, nor the Planning Board shall consider any application for a variance from this Division until the RPATAC has had an opportunity to review the application and make a written recommendation to the respective board. Any application for a variance from this Division shall be transmitted to the RPATAC, which shall have forty- five (45) days from the filing of the application to review and issue its recommendation.

SECTION 40.10.410 ENVIRONMENTAL IMPACT ASSESSMENT REPORT

If a proposed use requires an environmental impact assessment report, pursuant to Table 40.10.210 and Section 40.10.540, the applicant shall have such a report certified by a professional engineer, geologist or other certified professional in the applicable environmental discipline. Mitigation cannot be used where the conflict can be avoided or minimized. The report shall contain the following criteria, given in order of preference:

- A) **Site character.** The report shall identify all potential on-site sensitive environmental concerns.
- B) **Avoidance.** Alternative sites or routes shall be identified that would not damage the resource or result in less resource damage. Reasons shall be provided explaining why using these sites is impossible or infeasible versus that proposed.
- C) **Minimization.** The applicant shall demonstrate that the plan minimizes the impact of the activity, route, or use on the resource. The applicant shall also demonstrate that the areas impacted shall be the lowest quality and result in the least damage to the resource.
- D) **Mitigation.** A mitigation plan shall be submitted indicating mitigation activities. On-site replacement is the most acceptable form of mitigation. However, mitigation can include restoration and enhancement after the use is abandoned. Mitigation by replacement on another site shall be at a ratio of two to one (2:1). Mitigation may also include enhancement; this ratio shall be four to one (4:1). See Table 40.10.350B.

DIVISION 40.10.600 STORAGE OF HAZARDOUS SUBSTANCES AND PETROLEUM PRODUCTS

The storage, maintenance, use, or sale of substances listed in 40 CFR 116 in an aggregate quantity equal to or greater than a reportable quantity as defined in 40 CFR 117 shall be governed by the following provisions.

Petroleum products shall also meet the requirements of this section.

- A) All such activities are prohibited in floodplains, floodways, wellhead class A, B or C, the Cockeysville Formation, drainageways, recharge areas, steep slopes, critical natural areas, wetlands, riparian buffers and sinkholes, unless such substances are used in the process of public water supply and treatment and sewer treatment facilities.
- B) The replacement of existing underground petroleum storage tanks in any area other than a water resource protection area (WRPA) shall be permitted provided all State and federal regulations are met. The replacement of existing underground petroleum storage tanks in a water resource protection area (WRPA) where an upgrade is required by DNREC shall be permitted provided all State and federal regulations are met and secondary containment is provided.
- C) In all other areas where permitted, above ground storage shall be permitted provided such facilities are designed so that all spills are fully contained in a secondary containment facility that is designed such that there is no spill into soils, surface waters, sewers. The replacement of existing above ground storage facilities in any area shall be permitted provided the State Fire Marshall’s Office provides the Department with written approval and all other applicable state and federal regulations are met and secondary containment is provided. Secondary containment shall not be required for above ground storage used exclusively for private residential purposes when located on the residential lot within the setback lines.
- D) In all other areas where permitted, underground storage shall be permitted only for petroleum products, provided all State and federal regulations are met.

Appendix F

Excerpts from Kent County Code Chapter 187

' 187-26. Certificates and supporting statements.

I.) The following Open Space Certifications and Covenants or derivatives thereof, may be included on all record plans as warranted and required by the Commission:

- 1) Undisturbed Natural Areas as Conservation Areas:
 - a) All open space forest lands, old fields, meadows, regulatory floodplains, excellent groundwater recharge areas, wellhead protection areas, wetlands, riparian areas, streams, ponds and any other natural area existing at the time of recordation and designated as open space shall be subject to a natural area deed restriction.
 - b) Prior to land disturbance within any adjacent lots, these lands shall be posted with permanent metallic signs on 200 foot centers indicating "Conservation Area - The natural resources of this land are protected by deed restriction".
 - c) These lands shall be protected from any grass mowing, construction, land disturbance, dumping, filling, debris disposal, draining, shrub, tree or vegetation removal or harm, through an enforceable recorded deed restriction indicating the terms of this note, excepting, however, those operations necessary to initially construct a stormwater management outfall.
 - d) No disturbances or construction may occur beyond the limits of disturbance associated with the stormwater management facility without the prior consent of Kent County Department of Planning Services.
 - e) These areas shall be considered Nature Preserve Areas held in common by the Homeowners Association of _____ Subdivision. These deed restrictions shall run forever with the land and may not be vacated by the Homeowners Association or Maintenance Corporation."

' 187-51. Minimum requirements.

The minimum requirements for the installation of improvements in subdivisions shall be as follows:

- A) Streets.
 - 1) All new streets dedicated for public access shall be constructed in accordance with the construction standards adopted by the State Department of Transportation (DelDOT) for subdivision streets. Existing private roads and streets which are intended to be public streets and which do not meet State Department of Transportation specifications shall be brought into conformity.
 - 2) The roadbed and roadway wearing surface shall be constructed in accordance with applicable state regulations. Curbs and gutters shall be provided in all subdivisions unless all of the following are met:
 - a) The average lot size is ½ acre or larger;
 - b) Average lot frontage is 100 feet;
 - c) Street grades are less than six percent (6%); and
 - d) Building setbacks are at least sixty feet (60').Subdivisions with water resource conservation practices including open drainage systems are encouraged and alternatives to employ such practices shall be demonstrated. Where curbs and gutters are not required, stabilized shoulders and stabilized drainageways outside the shoulders shall be provided.
- B) Surface drainage facilities and erosion and sedimentation control.
 - 1) The subdivision shall be provided with such storm drains, culverts, drainageways, or other works as are necessary to collect and manage surface and concentrated storm water originating on or flowing across the subdivision, in order to prevent inundation and damage to streets, lots, and buildings.
 - 2) All surface drainage facilities and erosion and sedimentation control measures shall be in accordance with the state agency having jurisdiction.
 - 3) Lots shall be located and configured to provide positive drainage and prevent any nuisance flooding that would restrict reasonable use from occurring anywhere within the lot or on any adjacent lot or adjoining property.

- 4) All drainage and stormwater management facilities not maintained by DeIDOT shall be maintained by an approved homeowners' association or maintenance organization.
 - 5) Wherever practicable' and particularly outside of the designated growth zone, the County encourages the use of vegetated swales and biofiltration devices as key components of storm water management plans.
- C) Water supply facilities.
- 1) Subdivisions requiring a public water supply under the rules and regulations of the State Department of Natural Resources and Environmental Control (DNREC), the Office of the State Fire Marshal, the Department of Health and Social Services (DHSS), or the County as enumerated in Table X-1 below, shall be provided with a community water supply and distribution system. The source of supply may be municipal or private.
 - 2) The supply, treatment, and distribution system for the subdivision shall meet the standards of the utility and the applicable standards of the respective state agencies having jurisdiction.
 - 3) Individual on-site wells must be permitted and installed in accordance with DNREC requirements. All public wells located in a development should be at least 150 feet away from the outside boundary of the subdivision.

Appendix G

City of Newark Wellhead Protection Ordinance

Article VII. Water Resource Protection Regulations Amended: April 22, 1991

Sec. 30-52. Purpose

Because clean and safe water is a paramount requirement for public health, the City of Newark water supply must be preserved and protected. Therefore, it is the purpose of this article to promote public health, safety, and general welfare of our community by protecting our drinking water supply from pollution that may be associated with inappropriate land uses.

Sec. 30-53. General provisions

A) *Wellhead resource protection areas.*

- 1) Wellhead resource protection areas shall be those areas delineated by the Water Resources Agency for New Castle County, in conjunction with the City of Newark Water and Wastewater Department, and shown on the Water Resources Agency's Water Resource Protection Area map, dated 1987.
- 2) Said map is incorporated by reference herein, and copies may be found in the City of Newark Water and Wastewater Department.
- 3) Wellhead resource protection area means the surface and subsurface areas surrounding a water well or wellfield supplying a public water system through which contaminants are likely to move toward and reach such well or wellfield. These areas are graphically depicted on the water resources protection area map, dated 1987.
- 4) The wellhead resource protection areas may be modified from time to time based on the recommendation of the technical advisory committee established in subsection (d) of this article and the water resources protection area map shall be revised accordingly; substantial modifications in the water resource protection area map, based on the recommendation of the technical advisory committee, shall be made by city council by ordinance.

B) *Recharge protection areas.*

- 1) Recharge protection areas shall be those areas delineated by the Water Resources Agency for New Castle County, in conjunction with the City of Newark Water and Wastewater Department, and shown on the Water Resources Agency's Water Resource Protection Area map, dated 1987.
- 2) Said map is incorporated by reference herein, and copies may be found in the City of Newark Water and Wastewater Department.
- 3) Recharge protection areas are those land areas consisting of highly permeable geologic deposits including areas where surficial geologic deposits generally consist of coarse sand and gravel beds, silty gravels, coarse sand, or rock, coarse to medium sand, that have a hydraulic conductivity of 100 feet per day or greater.
- 4) The recharge protection areas may be modified from time to time based on the recommendation of the technical advisory committee established in subsection (d) of this article and the water resources protection area map shall be revised accordingly; substantial modifications in the water resource protection area map, based on the recommendation of the technical advisory committee, shall be made by city council by ordinance.

C) *Interpretation of boundaries.*

Where interpretation is needed concerning the exact location of the wellhead resource protection and recharge protection areas, the water and waste water director shall make the necessary and final interpretation, with the assistance of the technical advisory committee established in subsection (d) of this article. Any person contesting the location of these areas shall have the burden of establishing that such land does not lie within the areas as defined herein. To contest a location of a water resource protection area, the following information shall be submitted:

- 1) A detailed topographical survey of the location in question prepared by a registered professional land surveyor;
- 2) A revised surface soils map of the property prepared by a DNREC (Delaware Department of Natural Resources and Environmental Control) licensed soil scientist, including a written report of the on-site field inspection and test boring data;

- 3) Site specific geological and hydrogeological analyses shall be performed by a Delaware registered professional geologist and shall be based upon thorough site investigation and testing to be determined and established through regulations promulgated by the water and waste water department in consultation with the technical advisory committee; and
- 4) Evidence derived from a pumping test(s) or a sufficient number of test borings, test pits, observation wells, and groundwater elevations to clearly demonstrate that the area in question does or does not meet the definition of wellhead resources or recharge protection areas as defined in this article.

D) Technical Advisory Committee

A committee shall be established to assist in the interpretation of and/or revision of boundaries established in this article, the review of development plans within wellhead resources and recharge protection areas, and other related matters that may arise in the administration of this article. The committee shall consist of representatives from the Newark Planning and Water and Waste Water Departments, the Delaware Geological Survey, the Delaware Department of Natural Resources and Environmental Control, the Soil Conservation Service, and the Water Resources Agency for New Castle County. The committee shall be chaired by the Newark Director of Water and Waste Water and shall be convened by the director when, in the director's opinion, technical advice is necessary for the administration of this article as described herein. The committee shall be advisory only; all final determinations shall be made by the water and wastewater director.

Sec. 30-54. Use Regulations

Notwithstanding the uses permitted and area requirements and zoning districts established in Chapter 32, Zoning, the following water resources protection use regulations shall apply:

A) Wellhead resource protection areas.

- 1) In residential districts in Chapter 32, Zoning, the permitted uses shall be restricted to one family detached dwellings with a maximum number of dwellings per gross area not to exceed one dwelling per two acres, with a minimum total gross lot area of two acres, except for open space, parks, municipal facilities, street rights-of way, private and public swimming pools, accessory uses and accessory buildings, public transit stops and related uses, and provided that any construction consisting of structures and/or paved areas shall be maintained at least 150 feet from the wellhead, with the impervious surface for any permitted use not to exceed 10% of the total lot area for the use; except that subject to the approval of the water and waste water director, one family detached dwellings with a maximum number of dwelling units per gross acre not to exceed two dwelling units per acre, with a minimum total lot area of one acre, with the impervious surface for any permitted use not to exceed 20% of the total area for the use, and with any construction consisting of structures and/or paved areas maintained at least 150 feet from the wellhead, subject to the submittal of on-site hydrogeological studies that show that such development shall be maintained at a minimum 60 day horizontal time of travel from any water well supplying a public water system, whichever is greater; and subject to hydrogeological studies that show that the volume and quantity of groundwater recharge shall be maintained at predevelopment levels.
- 2) In business, industrial, manufacturing office research, and university districts, in Chapter 32, Zoning, the impervious surface for any permitted use shall not exceed 50% of the total lot area for the use, and provided that any construction consisting of structures and/or paved areas, shall be maintained at least 150 feet from the wellhead subject to the submittal of on-site hydrogeological studies that show that such development shall be maintained at a minimum 60 day horizontal time of travel from any water well supplying a public water system, whichever is greater.
- 3) The use, storage, treatment, or disposal of hazardous substances defined as substances listed in 40 Code of Federal Regulations, Part 116, "Designation of Hazardous Substances," in quantities listed in 40 Code of Federal Regulations, Part 117, "Determination of Reportable Quantities for Hazardous Substances," which are defined as substances that when discharged into the environment are an imminent and substantial danger to public health, welfare, ground and surface water, aquatic organisms, including but not limited to fish, shellfish, terrestrial life, birds, and other wildlife, and infectious wastes as defined in 7 Del.C., Ch.60, Sec. 11, shall be prohibited, except that subject to the approval of the water and waste water director, the use, storage, treatment, or disposal may be permitted of the substances described in this section with appropriate safeguards based on applicable federal, state and local regulations which shall be installed to prevent the release and/or discharge into the environment of these substances.

- 4) The underground storage of oil, petroleum, and petroleum products shall be prohibited. The above ground storage of oil, petroleum, and petroleum products shall be permitted provided that secondary containment facilities based on applicable federal, state and local regulations capable of capturing the materials stored on the site are provided, subject to the approval of the water and waste water director.
- 5) The burial, dumping, or disposal of municipal, industrial, or agricultural waste, defined as any land use associated with the disposal, storage and treatment, or transfer of municipal solid waste, sewerage treatment plant sludge, or industrial residual waste, and other special solid waste, shall be prohibited.

B) Recharge protection areas.

- 1) Appropriate safeguards based on applicable federal, state, and local regulations shall be required to be installed to prevent the release and/or discharge into the environment resulting from the use, storage, or treatment of hazardous substances defined as substances listed in 40 Code of Federal Regulations, Part 116, "Designation of Hazardous Substances," in quantities listed in 40 Code of Federal Regulations, Part 117, "Determination of Reportable Quantities for Hazardous Substances," which are defined as substances that when discharged into the environment are an imminent and substantial danger to public health, welfare, ground and surface water, aquatic organisms, including but not limited to fish, shellfish, terrestrial life, birds, and other wildlife, and infectious wastes as defined in 7 Del.C., Ch.60, Sec. 11.
- 2) Secondary containment pursuant to State of Delaware regulations governing underground storage tanks shall be required to be installed for the underground storage of oil, petroleum, or petroleum products.
- 3) The burial, dumping, or disposal of municipal, industrial, or agricultural waste, defined as any land use associated with the disposal, storage and treatment, or transfer of municipal solid waste, sewerage treatment plant sludge, or industrial residual waste, and other special solid waste, shall be prohibited
- 4) The above ground storage of oil, petroleum, and petroleum products shall be prohibited. The above ground storage of oil, petroleum, and petroleum products shall be permitted provided that secondary containment facilities based on applicable federal, state and local regulations capable of capturing the materials stored on the site are provided, subject to the approval of the water and waste water department.
- 5) For any use permitted in this section, the volume and quantity of groundwater recharge shall be maintained at predevelopment levels. In order to establish that this standard is met, landowners may be required by the water and waste water director to conduct appropriate hydrogeological studies.

C) Nonconforming uses.

Nonconforming uses may continue to wellhead resource protection and recharge protection areas in the form in which they existed at the time of the adoption of this article, unless they pose a direct hazard to the city's water supply, as determined by the water and waste water department upon advice from the Delaware Division of Public Health, or are causing some foreign substances (oil, salts, chemicals, or other substances) to be introduced into the city's water supply, as determined by the water and waste water department upon advice from DNREC's Division of Air and Waste Management and Division of Water Resources. In the latter case, the building department shall issue a mandatory cease and desist to stop the offending activity within the area. Nonconforming existing underground or above-ground storage of oil, petroleum and petroleum products shall require secondary containment pursuant to the State of Delaware regulations governing underground storage tanks or for above-ground storage of petroleum products secondary containment facilities capable of capturing the material stored on the site, for existing facilities that are either proposed to be upgraded or replaced.

Sec. 30-55. Enforcement.

This article shall be enforced by the water and wastewater director with the assistance of the planning and building directors. No building permit shall be issued for the construction of any building or structure, or for any use in violation of the provisions of these regulations.

Sec 30-56. Effective date.

This article shall become effective upon adoption by city council, except that subdivisions and/or building permits approved prior to this date shall be exempt from the provisions of this article, except as otherwise regulated herein.

Appendix H

Town of Townsend Environmental Protection Regulations

Article XI Townsend Environmental Protection Regulations, adopted November 7, 2001

Section 1100 Intent.

The intent of this section is to provide clarification on the environmental constraints and requirements for development in environmentally sensitive areas.

Section 1109 Water Resources Protection Areas (WRPA).

Water resource protection areas are Wellheads Class A and Recharge Areas. All such areas are as depicted on the three- map series "Water Resource Protections Areas for the City of Newark, City of Wilmington, New Castle County, Delaware," prepared by the Water Resources Agency for New Castle County that is dated 1993, or as amended. These areas shall be protected as required by the following sections to protect the Town's water resources from contamination and pollution.

Section 1110 Wellheads Class A.

- A) Areas within three hundred (300) feet of the well shall be one hundred (100) percent open space.
- B) The protection area around the well may be reduced to a one hundred and fifty (150) foot radius provided a hydrogeological report, prepared by a Delaware Registered Geologist and submitted to the satisfaction of the Delaware Geological Survey and the DNREC, is prepared. The report must certify that (1) the minimum 60-day time of-travel from a point to the public water supply well is maintained and (2) the well draws from a confined aquifer.
- C) The natural runoff flowing into wellhead areas shall be allowed and all new stormwater run-off shall be diverted around the wellhead protection areas wherever practical.
- D) The stormwater system's discharge to wellhead WRPAs shall be by sheet through a grassland or discharge from a stormwater management facility having a wetland or aquatic bench. Stormwater runoff from all parking areas shall be directed to a stormwater management facility before it is discharged into a wellhead WRPA.
- E) Within the wellhead area, impervious surfaces shall be limited to the buildings and access associated with the well and distribution and treatment facilities and their maintenance.
- F) The minimum lot area for a proposed public water supply well and related facility drawing from a confined aquifer shall be 1 acre and the minimum lot area for a public well drawing from an unconfined aquifer shall be 2 acres.
- G) This Section does not apply to wellheads constructed prior to August 2001. All existing wellheads constructed prior to this date are considered as being "grandfathered" and the regulations of the section do not apply.

Section 1111 Recharge Areas.

Recharge Areas are those areas with high percentages of sand and gravel that have "excellent" potential for recharge as determined through a Stack Unit Mapping Analysis performed originally by the Delaware Geological Survey.

- A) Within Townsend Proper - Development within the environs of downtown Townsend (Townsend Proper, as defined in Section 1101) may occur provided the gross percent impervious cover of the parcel within the recharge area is either 50% or less or as dictated under Appendix A of the Town Code for maximum lot coverage (whichever is most stringent). In situations where the existing impervious cover of a property is over 50% and the applicant desires to re-develop the property, the gross impervious cover shall be equal to or less than the original impervious cover percentage of the original site. In areas zoned as either Commercial (C) or Industrial (I) within Townsend Proper, the applicant can seek relief by submitting an environmental study and report certified by a state registered professional geologist or professional engineer with a background in hydrogeology that indicates that additional development would not endanger the public or the environment.

- B) Within Townsend Greenbelt - New development within the environs outside of Townsend Proper (Townsend Greenbelt, as defined in Section 1101) may occur provided the gross percent impervious cover of the entire parcel and/or development within the recharge area to be constructed is 30% or less.
- C) No underground storage tanks containing petroleum or any chemicals shall be permitted in a designated recharge area.
- D) For all new construction, all structures shall be required to discharge all roof drains into underground recharge systems. No above ground discharge is permitted in recharge areas by roof drains.
- E) Refer to Figure 11-11.1 for the Town boundaries of the areas designated as “Townsend Proper” and “Townsend Greenbelt”.

Section 1112 Boundary Determination for WRPA.

- A) All subdivision and land development plans depicting development or land disturbance submitted for Town review shall be evaluated for the existence of water resource protection areas by scaling for distances shown on the water resource protection area map. If existing, the boundaries of the areas shall be delineated on the plan by the applicant's engineer.
- B) When there appears to be a conflict between the mapped boundary and actual site conditions, the applicant may engage the services of professional practitioners set forth in this section to prepare a report intended to determine more accurately the precise boundary of the water resource protection area, which report shall be submitted to the Town with the detailed findings necessary to indicate the location of the boundary.
- C) The plan showing the boundary conflict should indicate the following:
 - 1) A detailed topographic layout of the subdivision and/or area to be developed prepared by a land surveyor or engineer.
 - 2) For floodplain and erosion-prone slopes boundary determinations, a revised surface soils map of the subdivision and/or area prepared by a DNREC-licensed soil scientist including a written report of the on-site field inspection and test boring data;
 - 3) For reservoir watershed, wellhead and recharge boundary determinations, a site-specific geological and hydro-geological analysis shall be performed by a state-registered professional geologist or engineer with a background in hydro- geology and shall be based upon through site investigation and testing; and
 - 4) Evidence derived from a site-specific investigation which may include aquifer testing, test borings, test pits, observation wells, groundwater elevations and topography surveys as appropriate for the type of water resource protection area to clearly demonstrate that the area in question does not meet the definition of a water resource protection area as defined in this section.
- D) The applicant is permitted to make a submission to the County with the advice of the Delaware Geological Survey and the University of Delaware Water Resources Agency, to adjust the boundary or area designation based thereon. Such adjustments shall have the effect of exempting the subject parcel from the use regulations of this section and shall have the effect of amending the limits of the water resource protection area. The applicant will then be required to provide a notification sent by the County indicating that they concur with the amended boundary location in order to be exempted from the requirements of this section.

Appendix I

Town of Smyrna Wellhead Protection Ordinance

An Ordinance To Amend Appendix A, Smyrna Zoning Ordinance, Section 5.

Be it hereby enacted by the Town Council of the Town of Smyrna, a majority thereof concurring in council duly met that Appendix A, Smyrna Zoning Ordinance, be amended as follows: insert a new subsection 18. Wellhead Protection Overlay District (WPOD) as follows:

18) Wellhead Protection Overlay District (WPOD)

- A) Declaration of legislative intent. The intent of this ordinance is to insure the provision of a safe and sanitary drinking water supply for the Town of Smyrna by the establishment of wellhead protection overlay districts. Each district shall be established around wells which are owned by the Town, and in use for potable water or proposed for use for potable water.
- B) Applicability of the wellhead protection overlay districts.
 - 1) Regulations pertaining to the wellhead protection overlay districts shall be applicable to all land areas designated within each district on the Town's official Zoning Map (Zoning Map). The area to be contained within each wellhead protection overlay district shall be a radius of 500' from the center of the wellhead and shall be shown on the Zoning Map.
 - 2) The regulations of each wellhead protection overlay district shall be superimposed over the regulations of the underlying zoning district in which such parcels or lots are located. In the event of conflicting zoning regulations between the various zones in which a lot or parcel is located, the regulations for the wellhead protection overlay district shall be controlling.
- C) Wellhead protection overlay map.
 - 1) The Town shall have prepared and keep current as part of the Town Official Zoning Map, a delineation showing the lands consisting of and containing that real property listed in subsection b of this section. Said Map shall be made available to the public and shall be utilized by the administrative official in determining whether a lot or parcel lies within the wellhead protection overlay district as described in subparagraph b of this section. The lack of an indication on this map as to whether certain property is within or outside of the boundaries of this overlay district shall not be construed as a conclusive determination that said property is or outside the boundaries of the wellhead protection overlay district. Rather, the controlling factor in making such a determination shall be the description contained in subparagraph (b) of this subsection.
- D) Uses permitted in Wellhead Protection District.
 - 1) Uses permitted by right. Only those uses permitted in the underlying zoning district; no additional uses shall be permitted as of right by virtue of being in the wellhead protection overlay district.
- E) Prohibited uses. The following uses are specifically prohibited:
 - 1) Surface use of hazardous materials, including commercial use of agricultural pesticides, herbicides, or fertilizers in concentrations greater than the manufacturer's or USDA recommendations;
 - 2) Storage of such materials as provided in (1) or stockpiling of manure;
 - 3) Intensive agricultural practices such as feedlots or chicken houses;
 - 4) Septic tanks or drain fields appurtenant thereto;
 - 5) Impervious surfaces other than roofs of buildings, and streets, parking lots, driveways and walks serving buildings as permitted in the underlying zoning district.
 - 6) Sanitary landfills;
 - 7) Hazardous waste disposal sites;
 - 8) Storm water infiltration basins;
 - 9) Underground storage tanks;

Section 2 In Section 19. Definitions. add the following definitions alphabetically:

Hazardous waste or material: Any waste or material which, because of its quantity, concentration of physical, chemical, or infectious characteristics may:

- 1) Cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness; or

- 2) Pose a substantial present or potential hazard to human health or to the environment when improperly treated, stored, transported, disposed of or otherwise managed.

Potable water: is that water that is satisfactory for drinking, culinary and domestic purposes, meeting current state and federal drinking water standards.

Sanitary landfill: a disposal site where solid wastes, including putrescible wastes or hazardous wastes, are disposed of on land by placing earth cover thereon.

Wellhead: the upper terminal of a well, including adapters, ports, seals, valves and other attachments.

Wellhead protection area: the surface and subsurface area surrounding a water well or well field supplying a public water system through which contaminants are reasonably likely to move toward and reach such well or well field.

Appendix J

Town of Delmar Wellhead Protection Ordinance

RESOLUTION # 1997-5: Wellhead Protection Delineation Area

WHEREAS, the Mayor and Council recognized the importance of and benefits to public health provided by a non-polluted drinking water supply;

WHEREAS, the Town of Delmar draws drinking water from two wells in an unconfined aquifer located on York Street;

WHEREAS, the State of Delaware has delineated a wellhead protection area based on a computer simulation study, exhibit 'A';

THEREFORE, Mayor and Council desire to adopt the referenced wellhead delineation area for the purpose of providing public education to encourage and promote safe practices to prevent pollution ground water within the adopted area, exhibit 'A'.

ORDINANCE NO. 40: An Ordinance Relating To The Conservation of Water in the Town of Delmar, DE

Section 1. No person shall carelessly or intentionally overuse the water being supplied by the Town to the citizens of Delmar, Delaware.

Section 2. No person shall allow their lawn sprinklers, hoses, or the like to run continuously during the hours of darkness.

Section 3. The Mayor and the Council of the Town of Delmar, Delaware may prescribe the hours for sprinkling of lawns, washing of cars, hosing of sidewalks and the like and any person violating such an order which shall be published in the local newspaper and posted in three public places shall be guilty under this Ordinance of a misdemeanor.

Section 4. The Mayor and the Council of the Town of Delmar, Delaware in an emergency may set forth such rules and regulations that are necessary to conserve the Town's water supply and any person violating such rules and regulations which shall be published in the local newspaper and posted in three public places shall be guilty under this Ordinance of a misdemeanor.

Section 5. Whoever violating any provision of this Ordinance or any order, rule or regulation set forth hereunder by the Mayor and Council of the Town of Delmar, Delaware, shall be fined not less than \$25.00 nor more than \$100.00 or imprisoned not less than 10 days nor more than 30 days, or both.

Appendix K

Delaware Sediment and Stormwater Regulations 2001 Amendments

Section 1 - Scope

- 1) Stormwater runoff may reasonably be expected to be a source of pollution to waters of the State, and may add to existing flooding problems. The implementation of a statewide sediment and stormwater program will prevent existing water quantity and water quality problems from becoming worse, and in some cases, reduce existing problems.
- 2) Sediment and stormwater approvals are required for land changes or construction activities for residential, commercial, ~~silvicultural~~, industrial, or institutional land use which are not exempted or waived by these Regulations. Requirements under these Regulations do not apply to agricultural land management practices unless the Conservation District or the Department determines that the land requires a soil and water conservation plan, and the owner or operator of the land has refused either to apply to a Conservation District for the development of such a plan, or to implement a plan developed by a Conservation District.
- 3) The Department intends that, to the extent possible, the provisions of these Regulations be delegated to either the Conservation Districts, local governments, or other State agencies. Those program provisions which are subject to delegation include sediment and stormwater management plan approval, inspection during construction, post-construction inspection, and education and training. Initial consideration regarding delegation of program components shall be given to the Conservation Districts
- 4) The implementation of a stormwater utility represents a comprehensive approach to program funding and implementation. The activities which may be undertaken by a stormwater utility include not only assessment, collection, and funding activities, but also carrying out provisions of adopted stormwater management plans. These provisions may include contracting for such services as project construction, project maintenance, project inspection, and enforcement of installation and maintenance requirements imposed with respect to approved land disturbing activities.

Section 2 - Definitions

As used in these regulations, the following terms shall have the meanings indicated below:

- 1) “Adverse Impact” means a negative impact to land or waters resulting from a construction or development activity. The negative impact includes increased risk of flooding; degradation of water quality; increased sedimentation; reduced groundwater recharge; negative impacts on aquatic organisms; negative impacts on wildlife and other resources, and threatened public health.
- 2) “Agricultural Land Management Practices” means those methods and procedures generally accepted by the Conservation Districts and used in the cultivation of land in order to further crop and livestock production and conservation of related soil and water resources.
- 3) “Applicant” means a person, firm, or governmental agency who executes the necessary forms to obtain ~~plan~~ approval ~~or a permit~~ for a land disturbing activity.
- 4) “Appropriate Plan Approval Agency” means the Department, Conservation District, county, municipality, or State agency that is responsible in a jurisdiction for review and approval of sediment and stormwater management plans.
- 5) “As-Built Plans or Record Documents” means a set of engineering or site drawings that delineate the specific ~~approved-permitted~~ stormwater management facility as actually constructed.
- 6) “Certified Construction Reviewer” means those individuals, having passed a Departmental sponsored or approved training course, who provide on-site inspection for sediment control and stormwater management in accordance with these regulations.
- 7) “Delegation” means the acceptance of responsibility by a Conservation District, county, municipality, or State agency for the implementation of one or more elements of the statewide sediment and stormwater management program.
- 8) “Department” means the Department of Natural Resources and Environmental Control.
- 9) “Designated Watershed or Subwatershed” means a watershed or subwatershed proposed by a Conservation District, county, municipality, or State agency and approved by the Department. The Department may establish

additional requirements in these watersheds and subwatersheds due to existing water quantity or water quality problems. These requirements shall be implemented on an overall watershed or subwatershed master plan that is developed for water quality and/or water quantity protection.

- 10) "Detention Structure" means a permanent stormwater management structure whose primary purpose is to temporarily store stormwater runoff and release the stored runoff at controlled rates.
- 11) "Develop Land" means to change the runoff characteristics of a parcel of land in conjunction with residential, commercial, industrial, or institutional construction or alteration.
- 12) "Developer" means a person undertaking, or for whose benefit, activities covered by these regulations are commenced and/or carried out.
- 13) "Drainage Area" means that area contributing runoff to a single point measured in a horizontal plane, which is enclosed by a ridge line.
- 14) "Easement" means a grant or reservation by the owner of land for the use of such land by others for a specific purpose or purposes, and which must be included in the conveyance of land affected by such easement.
- 15) "Erosion and Sediment Control" means the control of solid material, both mineral and organic, during a land disturbing activity, to prevent its transport out of the disturbed area by means of air, water, gravity, or ice.
- 16) "Exemption" means those land development activities that are not subject to the sediment and stormwater requirements contained in these regulations.
- 17) "Grading" means excavating, filling (including hydraulic fill) or stockpiling of earth materials, or any combination thereof, including the land in its excavated or filled condition.
- 18) "Green Technology Best Management Practices (BMP's)" means those practices that achieve stormwater management objectives by applying the principles of filtration, infiltration and storage most often associated with natural vegetation and undisturbed soils while minimizing a reliance on structural components. They may also be constructed using an imported soil medium and planted with vegetation designed to promote the natural hydrologic process. These practices include, but are not limited to, vegetative filtration, riparian buffer plantings, bioretention areas, vegetative flow conveyance, as well as recharge and surface storage in undisturbed natural areas.
- 19) "Infiltration" means the passage or movement of water through the soil profile.
- 20) "Land Disturbing Activity" means a land change or construction activity for residential, commercial, ~~silvicultural~~, industrial, and institutional land use which may result in soil erosion from water or wind or movement of sediments or pollutants into State waters or onto lands in the State, or which may result in accelerated stormwater runoff, including, but not limited to, clearing, grading, excavating, transporting and filling of land.
- 21) "Off-site Stormwater Management" means the design and construction of a stormwater management facility that is necessary to control stormwater from more than one land disturbing activity.
- 22) "On-site Stormwater Management" means the design and construction of stormwater management practices that are required for a specific land disturbing activity.
- 23) "Person" means any State or federal agency, individual, partnership, firm, association, joint venture, public or private corporation, trust, estate, commission, board, public or private institution, utility, cooperative, municipality or other political subdivision of this State, any interstate body or any other legal entity.
- 24) "Redevelopment" means a land disturbance activity that alters the use of land but does not necessarily alter the pre-development runoff characteristics.
- 25) "Responsible Personnel" means a foreman or superintendent who is in charge of on-site clearing and land disturbing activities for sediment and stormwater control associated with a construction project.
- 26) "Sediment" means soils or other surficial materials transported and/or deposited by the action of wind, water, ice or gravity as a product of erosion.
- 27) "Sediment and Stormwater Management Plan" (or **Detailed Plan**) means a plan for the control of soil erosion, sedimentation, stormwater quantity, and water quality impacts resulting from any land disturbing activity.
- 28) "Stabilization" means the prevention of soil erosion by surface runoff or wind through the establishment of a soil cover through the implementation of vegetative or structural measures. Examples include, but are not limited to, straw mulch with temporary or permanent vegetation, wood chips, and stone or gravel ground cover.
- 29) "Standard Plan" means a set of pre-defined standards and/or specifications for minor land disturbing activities that may preclude the preparation of a detailed plan under specific conditions.
- 30) "State Waters" means any and all waters, public or private, on the surface of the earth which are contained within, flow through or border upon the State or any portion thereof.
- 31) "Stormwater" means the runoff of water from the surface of the land resulting from precipitation or snow or ice melt.

- 32) “Stormwater Management” means:
- A) for water quantity control, a system of vegetative, structural, and other measures that may control the volume and rate of stormwater runoff which may be caused by land disturbing activities or activities upon the land; and
 - B) for water quality control, a system of vegetative, structural, and other measures that control adverse effects on water quality that may be caused by land disturbing activities or activities upon the land.
- 33) “Stormwater Utility” means an administrative organization that has been established for the purposes of funding sediment control, stormwater management or flood control planning, design, construction, maintenance, and overall resource needs by authorized and imposed charges.
- 34) “Tidewater” means water that alternately rises and falls due to the gravitational attraction of the moon and sun and is under the regulatory authority of Delaware Code, Title 7, Chapter 72. Examples of tides include the Atlantic Ocean, the Delaware Bay, and the Delaware Inland Bays.
- 35) “Variance” means the modification of the minimum sediment and stormwater management requirements for specific circumstances where strict adherence of the requirements would result in unnecessary hardship and not fulfill the intent of these regulations.
- 36) “Waiver” means the relinquishment from sediment and stormwater management requirements by the appropriate plan approval authority for a specific development on a case-by-case review basis.
- 37) “Water Quality” means those characteristics of stormwater runoff from a land disturbing activity that relate to the chemical, physical, biological, or radiological integrity of water.
- 38) “Water Quantity” means those characteristics of stormwater runoff that relate to the rate and volume of the stormwater runoff to downstream areas resulting from land disturbing activities.
- 39) “Watershed” means the total or partial drainage area contributing stormwater runoff to a single point.

Section 3 - Exemptions, Waivers, and Variances

- 1) The following activities are exempt from both sediment control and stormwater management requirements established by these regulations:
 - A) Agricultural land management practices, unless the local Conservation District or the Department determines that the land requires a new or updated soil and water conservation plan, and the owner or operator of the land has refused either to apply to a Conservation District for the development of such a plan, or to implement a plan developed by a Conservation District;
 - B) Developments or construction that disturb less than 5,000 square feet;
 - C) Land development activities which are regulated under specific State or federal laws which provide for managing sediment control and stormwater runoff. An example of this exemption would be specific permits required under the National Pollutant Discharge Elimination System when discharges are a combination of stormwater and industrial or domestic wastewater or which must comply with Parts 122, 123, and 124 of Title 40 of the Code of Federal Regulations. The Department shall ensure that all land developments which are regulated under specific State or federal laws are coordinated with delegated plan approval agencies to ensure compatibility of requirements
 - D) Projects which are emergency in nature that are necessary to protect life or property such as bridge, culvert, or pipe repairs and above ground or underground electric and gas utilities or public utility restoration. The emergency nature of a project may preclude prior plan review and approval, but subsequent inspection may necessitate sediment control or site stabilization in accordance with the provisions of this Chapter. The appropriate plan approval agency shall be notified orally or in writing within 48 hours of the initiation of such emergency activity. The appropriate plan approval agency shall determine and approve of the emergency nature of a project. If the nature of the emergency will require more than 120 days to accomplish construction, formal approval shall be obtained for sediment control and stormwater management. These activities must still comply with other State, federal, and local requirements.
 - E) Commercial forest harvesting operations that meet the requirements of the Department of Agriculture under Subchapter VI, Chapter 29, Title 3, of the Delaware Code.
- 2) Appropriate Plan Approval Agencies may grant waivers from the stormwater management requirements of these regulations for individual developments provided that a written request is submitted by the applicant

containing descriptions, drawings, and any other information that is necessary to evaluate the proposed development. A separate written waiver request shall be required if there are subsequent additions, extensions, or modifications which would alter the approved stormwater runoff characteristics to a development receiving a waiver.

- A) A project may be eligible for a waiver of stormwater management for both quantitative and qualitative control if the applicant can demonstrate that:
 - i) The proposed project will return the disturbed area to a pre-development runoff condition and the pre-development land use cover is unchanged at the conclusion of the project; or
 - ii) The proposed project consists of a linear disturbance of less than ~~six (6)~~ ten (10) feet in width; or
 - iii) The project is for an individual residential detached unit or agricultural structure, and the total disturbed area of the site is less than one acre; or
 - iv) The proposed project is for agricultural structures in locations included in current soil and water conservation plans that have been approved by the appropriate Conservation District.
- B) A project may be eligible for a waiver or variance of stormwater management for water quantity control if the applicant can demonstrate that:
 - i) The proposed project will not generate an increase in the 2-year post-development peak discharge rate of more than ten (10) percent above the 2-year pre-development peak discharge rate and will have no adverse impact on the receiving wetland, watercourse, or waterway; or
 - ii) Provisions will be made or exist for a nonerosive conveyance system to tidewater by either a closed drainage system or by open channel flow that has adequate capacity to contain the runoff events being considered as a requirement of these regulations; or
 - iii) The location of a project within a watershed would aggravate downstream flooding by the imposition of peak control requirements.
- 3) The plan approval agency may grant a written variance from any requirement of these regulations if there are exceptional circumstances applicable to the site such that strict adherence to the provisions of these regulations will result in unnecessary hardship and not fulfill the intent of these regulations. A written request for variance shall be provided to the plan approval agency and shall state the specific variances sought and the reasons for their granting. The plan approval agency shall not grant a variance unless and until sufficient specific reasons justifying the variance are provided by the applicant.

Section 4 - Departmental Responsibilities

- 1) The Department is responsible for the implementation and supervision of the sediment and stormwater program which is established by Chapter 40, Title 7, Delaware Code. This responsibility shall include, but not be limited to, the authority to:
 - A) Provide technical and other assistance to Conservation Districts, counties, municipalities, federal, and State agencies in implementing this Chapter;
 - B) Develop and publish, as regulation components, minimum standards, guidelines and criteria for delegation of sediment and stormwater program components, and model sediment and stormwater ordinances for use by Conservation Districts, counties, State agencies, and municipalities;
 - C) Review the implementation of all components of the statewide sediment and stormwater management program that have been delegated to either the Conservation Districts, counties, municipalities, or other State agencies in reviews to be accomplished at least once every three years;
 - D) Require that appropriate sediment and stormwater management provisions be included in all new erosion and sediment control plans developed pursuant to these regulations;
 - E) Cooperate with appropriate agencies of the United States or other states or any interstate agency with respect to sediment control and stormwater management;
 - F) Conduct studies and research regarding the causes, effects, and hazards of stormwater and methods to control stormwater runoff;
 - G) Conduct and supervise educational programs with respect to sediment control and stormwater management;

- H) Require the submission to the Department of records and periodic reports by Conservation Districts, tax ditch organizations, county, and municipal agencies as may be necessary to carry out these regulations;
 - I) Review and approve designated watersheds;
 - J) Establish a maximum life of three years for the validation of approved plans. These regulations shall specify variances which expand this time limitation in specific situations; and
 - K) Establish a means of communication, such as a newsletter, so that information regarding program development and implementation can be distributed to interested individuals.
- 2) Matters of policy, procedures, standards, criteria, approvals, inspection, or enforcement relating to the Sediment and Stormwater Chapter shall be established by the Department subject to the jurisdiction of the Secretary of the Department. Sediment and stormwater programs or portions of programs which are delegated to the Conservation Districts, counties, municipalities, or State agencies shall include sediment and stormwater criteria consistent with the standards, procedures, and regulations of the Department. A variation of requirements by the delegated agency on a specific watershed will not be valid unless approved by the Department. All State and federal development in the watershed shall be reviewed subject to the same variations and requirements by the delegated State agency or Department as appropriate.
 - 3) In situations where public notification and comment are required before an action is taken by the Department, the Regulatory Advisory Committee shall have an opportunity to review the proposed Departmental action and provide input to the Department regarding the action.

Section 5 - Criteria for Delegation of Program Elements

- 1) Conservation Districts, counties, municipalities, and State agencies may seek delegation of four program elements relating to the implementation of the statewide sediment and stormwater program. Delegation may be granted by the Secretary for review and approval of sediment and stormwater management plans, inspection during construction, subsequent maintenance inspection, and education and training. Program elements that are delegated shall be implemented according to Chapter 40 and these regulations.
- 2) The Secretary, or his designee, shall grant delegation of one or more program elements to any Conservation District, county, municipality, or State agency seeking delegation that is found capable of providing compliance with Chapter 40 and these regulations. The final decision regarding delegation shall be made only after an opportunity has been provided for public review and comment. Initial consideration regarding delegation of program elements shall be given to the Conservation Districts. The Conservation Districts, having unique capabilities and area wide responsibilities are in ideal positions to coordinate and implement local sediment and stormwater programs.
- 3) Requests for delegation of more than one program element may be accomplished by the submission of one request for all the elements requested. A concern by the Department over one element will not jeopardize delegation of other requested program elements.
- 4) To be considered capable of providing compliance with Chapter 40 and these regulations, applications for delegation of program elements shall contain the following requisite items.
 - A) Requests for delegation of plan approval responsibility shall include the following information:
 - i) Ordinance or program information detailing the plan approval process,
 - ii) Plan review check lists and plan submission requirements,
 - iii) Sediment and stormwater criteria, including waiver and variance procedures, that meet minimum standards established by these regulations,
 - iv) Assurance of adequate personnel allocations and expected time frames for plan review which meet the requirements of Section 8(9), and
 - v) Assurance that plan reviewers will attend Departmental training programs in related fields such as wetlands identification, subaqueous permits requirements, etc.
 - B) Requests for delegation of inspection during construction shall include the following information:
 - i) Inspection and referral procedures,
 - ii) Time frames for inspection of active land disturbing activities,
 - iii) Inspection forms,
 - iv) Assurance of adequate personnel allocations or a timetable to obtain adequate personnel,
 - v) Criteria for the Certified Construction Reviewer if utilized, and
 - vi) Procedures and time frames for processing complaints.

- C) Requests for delegation of maintenance inspection responsibility shall include the following information:
 - i) Inspection and referral procedures,
 - ii) Inspection forms,
 - iii) Time frames, not exceeding one year, for inspection of completed stormwater management structures, and
 - iv) Assurance of adequate personnel allocation or a timetable to obtain adequate personnel.
- D) Requests for delegation of education and training responsibility shall include the following information:
 - i) Types of educational and training activities to be accomplished,
 - ii) Frequency of activities,
 - iii) Names and backgrounds of those individuals conducting the training, and
 - iv) Procedures and timetables to notify the Department of educational programs.
- 5) A Conservation District, county, municipality, or State agency which has been granted delegation of one or more program elements may establish alternative requirements which are compatible with or are more stringent than Departmental requirements. These alternative requirements may be implemented only when prior Departmental approval has been granted. These alternative requirements shall apply in lieu of the provisions of these regulations in the specific program element that has been delegated. Alternative requirements shall be implemented only after public notice has been provided which would allow for public review and comment prior to Departmental approval.
- 6) Delegation of authority for one or more program elements may be granted for a maximum time frame of three years. After three years a new application to the Department must be made. Over the time frame for which delegation has been granted, the Department will evaluate delegation implementation, coordinate review findings with the delegated authority, and determine if the new delegation should be granted.
- 7) A Conservation District, county, municipality, or State agency requesting or renewing delegation shall submit a written request to the Secretary on or before January 1 of the year immediately preceding the fiscal year for which delegation or renewal of delegation is sought.
- 8) The Secretary shall, in writing, grant or deny delegation on or before April 1 of the year during which delegation is sought. The Secretary may not deny a requested delegation unless opportunity has been afforded to the appropriate officials to present arguments. Delegation shall be effective July 1 of that year and extend no more than three years, unless renewed. In the event that the Department does not act on the renewal request by April 1, the delegated authority submitting the request would be entitled to continue operating for a subsequent three year time period unless action is taken by the Department to suspend the program.
- 9) If the Secretary determines that a delegated program falls below acceptable standards established by these regulations, delegation may be suspended after opportunity is afforded for a hearing. During a period of suspension, the program element shall revert to the Department for implementation. Funds set aside by a delegated agency, that were collected through fees established by the plan approval agency, shall be transferred to the Department for use if delegation is suspended.
- 10) A delegated authority may sub-delegate program elements, with Departmental concurrence, to a stormwater utility or other responsible entity or agency.
- 11) The Department shall maintain, and make available upon request, a listing of the current status of delegation for all jurisdictions within the State.

Section 6 - Permit Plan Approval Fees, Maintenance Fees, and Performance Bonds

- 1) The establishment of permit plan approval fees, not involving stormwater utilities, shall be in accordance with the following items:
 - A) Delegation of program elements will depend, to a large extent, on funding and personnel commitments. If the delegated jurisdiction has a source of funding that is provided through State General or local revenues, then the implementation of the delegated component will not necessitate the imposition of a permit plan approval fee to cover the cost of the delegated program component.
 - B) In the event that one component of an overall sediment and stormwater management program is not funded through the use of general or special funds, a non-refundable permit plan approval fee will be collected at the time that the sediment and stormwater management plan or application for

waiver or variance is submitted or approved. The permit plan approval fee will provide for the unfunded costs of plan review, administration and management of the permitting-office approval agency, construction review, maintenance inspection, and education and training. The plan review or permit approval agency, whether delegated or the Department, shall be responsible for the collection of the permit plan approval fee. Unless all program elements in a county or municipality have been delegated to a single agency, the funds collected not supporting the plan review function shall be distributed to the appropriate agencies.

- C) The number of needed personnel and the direct and indirect expenses associated with those personnel shall be developed by the agencies requesting delegation in a specific jurisdiction in conjunction with and with the concurrence of the Department. Those expenses will then form the basis for determining unit plan approval costs.
 - D) Prior to plan approval, a fee may be assessed by the appropriate plan approval agency for those activities approved prior to July 1, 1991 for which construction will initiate after July 1, 1991.
 - E) Where the Department becomes the designated plan approval agency, the Department may assess a plan review and construction review fee. That fee shall not exceed \$80.00 per disturbed acre per project.
 - F) The use of Certified Construction Reviewers for sediment control and the submission of “As Built or Record Document” certification regarding stormwater management construction may reduce the inspection requirements for the delegated agency but may not eliminate that inspection requirement. Periodic overview inspections will still be necessary to ensure construction management.
- 2) The imposition of a financial guarantee, based on existing local authority, may be required by the plan approval agency to ensure that construction of the stormwater management practices was accomplished according to the approved sediment and stormwater management plan. The developer, when required, shall submit to the plan approval agency a surety or cash bond, or irrevocable letter of credit prior to the issuance of any building or grading permit for construction of any land disturbing activity that requires a stormwater management facility. The amount of the security shall not exceed 150% of the total estimated construction cost of the stormwater management facility. The financial guarantee so required shall include provisions relative to forfeiture for failure to complete work specified in the approved stormwater management plan, compliance with all the provisions of these regulations, and other applicable laws and regulations, and any time limitations. The financial guarantee, fully or partially, shall not be released without a final inspection of the completed work and, when required, after submission of “As Built or Record Document” plans, and after written confirmation by the design engineer that construction was accomplished according to the approved plans. A partial release of the financial guarantee shall be allowed only to the extent that the work already accomplished would warrant such release.
 - 3) A maintenance fee may be required on approvals granted for stormwater management structures that will be maintained by a Conservation District, county, or municipality. A fee mechanism shall be established prior to the final release of any required financial guarantee or final approval of the completed stormwater management structure by the designated construction review agency.

Section 7- Criteria for Implementation of a Stormwater Utility

The implementation of a stormwater utility will necessitate the development of a local utility ordinance prior to its implementation. There are essential components that an ordinance must contain to function as a funding mechanism for stormwater management and those components shall include, but not be limited to, the following items:

- 1) The financing of a stormwater utility with a user charge system must be reasonable and equitable so that each user of the stormwater system pays to the extent to which the user contributes to the need for the stormwater system, and that the charges bear a substantial relationship to the cost of the service. The use of county and municipal taxpayer rolls and accounting systems are allowed for the assessment and collection of fees.
- 2) The intent of the utility must be clearly defined regarding program components that are to be funded through the utility. Those components may include but not be limited to the following activities:
 - A) Preparation of long range watershed master plans for stormwater management,
 - B) Annual inspections of all stormwater management facilities, both public and private,

- C) Undertaking regular maintenance, through contracting or other means, of stormwater management structures that have been accepted for maintenance,
 - D) Plan review and inspection of sediment control and stormwater management plans and practices, and
 - E) Retrofitting designated watersheds, through contracting or other means, to reduce existing flooding problems or to improve water quality.
- 3) The authority for the creation of the stormwater utility and the imposition of charges to finance sediment and stormwater activities is conferred in Chapter 40, Title 7, Delaware Code. The application of a stormwater utility by means of a local ordinance shall not be deemed a limitation or repeal of any other powers granted by State statute.
 - 4) The creation of a stormwater utility shall include the following components:
 - A) The boundaries of the utility, such as watersheds or jurisdictional boundaries as identified by the local governing body,
 - B) The creation of a management entity,
 - C) Identification of stormwater problems,
 - D) Method for determining utility charges,
 - E) Procedures for investment and reinvestment of funds collected, and
 - F) An appeals or petition process.
 - 5) As established by local ordinance, the local governing agency shall have responsibility for implementing all aspects of the utility including long range planning, plan implementation, capital improvements, maintenance of stormwater facilities, determination of charges, billing, and hearing of appeals and petitions. The local agency also will have responsibility for providing staff support for utility implementation. In the event that an agency or department other than the one in which the utility is located is best equipped to undertake a particular task, the local governing agency shall ensure that appropriate interagency charges are determined such that all costs of stormwater management are reflected in the utility budget and that utility charges finance all aspects of stormwater management.
 - 6) With respect to new stormwater management facilities constructed by private developers, the local governing agency shall develop criteria for use in determining whether these will be maintained by the utility or by the facility owner. Such criteria may include whether the facility has been designed primarily to serve residential users and whether it has been designed primarily for purposes of stormwater management. In situations where it is determined that public maintenance is not preferable, standards shall be developed to ensure that inspection of facilities occurs annually and that facilities are maintained as needed.
 - 7) The use of charges is limited to those purposes for which the utility has been established, including but not limited to: planning; acquisition of interests in land including easements; design and construction of facilities; maintenance of the stormwater system; billing and administration; and water quantity and water quality management, including monitoring, surveillance, private maintenance inspection, construction inspection, and other activities which are reasonably required.

Section 8 - Permit Plan Application and Approval Process

- 1) After July 1, 1991, unless a particular activity is exempted by these regulations, a person may not disturb land without an approved sediment and stormwater management plan from the appropriate plan approval agency. A grading or building permit may not be issued for a property unless a sediment and stormwater management plan has been approved that is consistent with the following items:
 - A) Chapter 40, Title 7, Delaware Code, relating to erosion and sediment control and stormwater management, and;
 - B) These regulations, or duly adopted county or municipal ordinances that are adopted as a part of the delegation process and relate to the intent of these regulations.
- 2) A sediment and stormwater management plan or an application for a waiver shall be submitted to the appropriate plan approval agency by the developer for review and approval for a land disturbing activity, unless otherwise exempted. The sediment and stormwater management plan shall contain supporting computations, drawings, and sufficient information describing the manner, location, and type of measures in which stormwater runoff will be managed from the entire development. The appropriate plan approval agency shall review the plan to determine compliance with the requirements of these regulations prior to approval. The approved sediment and stormwater management plan shall serve as the basis for water quantity and water quality control on all subsequent construction.

- 3) The sediment and stormwater management plan shall not be considered approved without the inclusion of an approval stamp with signature and date, on the plans by the appropriate plan approval agency.
- 4) All sediment and stormwater management plans submitted for approval shall contain certification by the owner or developer that clearing, grading, construction, or development will be accomplished pursuant to the plan and that responsible personnel involved in the land disturbance will have a Certification of Training at a Departmental sponsored or approved training program for the control of erosion and sediment control before initiation of the project. The Certification of Training for responsible personnel requirement may be waived by the appropriate plan approval agency on any project involving silviculture or fewer than four residential homes.
- 5) All sediment and stormwater management plans shall contain certification by the owner or developer of the right of the Department or delegated inspection agency to conduct on-site inspections.
- 6) A grading or building permit issued by a local jurisdiction may be suspended or revoked after written notice is given to the permittee by the responsible delegated agency or the Department for any of the following reasons:
 - A) Violations of the conditions of the sediment and stormwater management plan approval;
 - B) Changes in site runoff characteristics upon which a waiver was granted;
 - C) Construction not in accordance with the approved plans;
 - D) Noncompliance with correction notice or stop work order issued for the construction of the sediment control practices or the stormwater management facilities;
 - E) An immediate danger exists in a downstream area in the opinion of the appropriate plan approval or inspection agency, or the Department; or
 - F) Failure to submit stormwater management "As Built or Record Document" plans, when required, at the completion of the project.
- 7) Approved plans remain valid for 3 years from the date of an approval, unless specifically extended or renewed by the appropriate plan approval agency. The basis for extension or renewal may include, but not limited to, the following items:
 - A) Failure to initiate the approved project for reasons acceptable to the appropriate plan approval agency such as funding or other agency permit delays; or
 - B) Time duration for a type of activity that typically exceeds three years.
- 8) Projects which have been approved prior to July 1, 1991, and where site clearing has not been initiated on the project within two years, shall be resubmitted to the appropriate plan approval agency for review and approval subject to the requirements of these regulations.
- 9) Upon receipt of a completed application for sediment and stormwater management, the appropriate plan approval agency shall accomplish its review within 30 calendar days, and have either the approval or review comments transmitted to the applicant. If that 30 day time frame cannot be met, the appropriate plan approval agency shall notify the applicant of the reasons for delay, and an expected time frame not to exceed an additional 30 days, when that review will be accomplished.

Section 9 - Criteria for Designated Watersheds

The concept of designated watersheds is intended, not only to prevent existing water quantity and water quality problems from getting worse, but also to reduce existing flooding problems and to improve existing water quality or meet State Water Quality Standards in selected watersheds. Criteria is established for designated watersheds and that criteria will depend on whether the specific problems of the watershed are water quantity or water quality oriented. Water quantity and water quality concerns will be considered in all designated watersheds, but the overall emphasis for each designated watershed will depend on its existing and anticipated problems.

- 1) To initiate consideration of a watershed for Designated Watershed or Subwatershed status, a watershed shall be recommended by a Conservation District, county, municipality, or State agency, to the Department. Upon recommendation to the Department, all involved agencies at the local level will be contacted and their input received prior to any watershed study being initiated.
- 2) Included with the recommendation of a watershed for Designated Watershed or Subwatershed status to the Department shall be an identification of the specific problems that exist in the watershed so that the pursuit of a watershed study is warranted. Inclusion in these regulations as a Designated Watershed or Subwatershed requires approval by the Department that a significant water quantity or water quality problem exists that would necessitate this joint State, District, and local government involvement. Also, inclusion of a watershed as a

Designated Watershed or Subwatershed will necessitate a public hearing process. The process of problem identification shall be based on the following information:

- A) To initiate a watershed study based on water quality considerations the following information must be submitted:
 - i) Existing water quality data that has been collected as a result of the overall statewide water quality inventory process, or
 - ii) Other water quality data collected through specific sampling that was accomplished in the watershed, or
 - iii) Submission of a water quality assessment that was accomplished using a qualitative collection method of benthic macroinvertebrates.
- B) To initiate a watershed study based on flooding or water quantity considerations the following information must be submitted:
 - i) Estimated annual flood damage to either private, residential, commercial, industrial, or public properties, or
 - ii) Number of residences or industries in the floodplain, or
 - iii) The history of flooding in the watershed, or
 - iv) Measures already taken to minimize or reduce flooding, or
 - v) Dangers to public health and welfare.
- 3) Upon modification of these regulations to include a watershed as a Designated Watershed or Subwatershed an advisory group will be established that will guide the overall watershed study. The advisory group will be appointed by the Secretary and will include State, District, and local representatives in addition to representatives of the regulated community and others affected by the results of the study.
- 4) The general components contained in the actual watershed studies shall be the following items:
 - A) Stormwater quantity or water quality problem identification,
 - B) The overall needs of the watershed including the additional impacts of new development activities,
 - C) Alternative approaches to address the existing and future problems,
 - D) A selected approach that includes the overall costs and benefits,
 - E) Schedule for implementation,
 - F) Funding sources that are available for the actual implementation of study recommendations, and
 - G) A public hearing process prior to final Departmental approval.
- 5) The following goals are to be obtained through the implementation of the Designated Watershed or Subwatershed program:
 - A) Reduction of existing flooding or water quality impacts,
 - B) Prevention of future flooding or water quality impacts, and
 - C) Minimization of economic and social losses.
- 6) Specific plan components of a water quality watershed study shall include, but not be limited to, the following items:
 - A) The limits of the watershed,
 - B) An inventory of existing water quality data,
 - C) An inventory of areas having significant natural resource value as defined in existing State or local studies as they may be impacted by the construction or location of stormwater control structures,
 - D) An inventory of areas of historical and archaeological value identified in existing State or local studies as they may be impacted by the construction or location of stormwater control structures,
 - E) A map or series of maps of the watershed showing the following information:
 - i) watershed topography,
 - ii) Significant geologic formations,
 - iii) Soils information,
 - iv) Existing land use based on existing zoning,
 - v) Proposed land use based on expected zoning or comprehensive plans,
 - vi) Location of tidal and nontidal wetlands, and
 - vii) Locations where water quality data were obtained.
 - F) An evaluation of water quantity concerns so that flooding does not become a problem in the watershed.
- 7) Specific components of a water quantity based study shall include, but not be limited to, the following items:
 - A) The limits of the watershed,
 - B) An inventory of historic flood damage sites, including frequency and damage estimates,

- C) An inventory of areas of significant natural resource value as noted in existing State and local studies as they may be impacted by the construction or location of stormwater control structures,
 - D) An inventory of areas of historical and archaeological value identified in existing State and local studies as they may be impacted by the construction or location of stormwater control structures,
 - E) A map or series of maps of the watershed showing the following information:
 - i) watershed topography,
 - ii) Soils information,
 - iii) Existing land use based on existing zoning,
 - iv) Proposed land use based on expected zoning or comprehensive plans,
 - v) Locations of tidal and nontidal wetlands,
 - vi) Locations of existing flooding problems including floor and corner elevations of structures already impacted, and
 - vii) 100 year floodplain delineations, water surface profiles, and storm hydrographs at selected watershed location.
 - F) An evaluation of water quality concerns so that water quality degradation does not become a problem in the watershed.
- 8) The initiation of studies for Designated Watersheds or Subwatersheds depends on the availability of funding for the study. Once a watershed has been designated, the Department will make every effort to secure funding through federal, State, or local means.
 - 9) The Department is designated as the agency responsible for administering designated watershed or subwatershed studies with the advice of the advisory group appointed by the Secretary. Recommendations based on the results of the watershed study will only be made with the overall consent of the advisory group.
 - 10) The formal results of the Designated Watershed or Subwatershed study will require formal acceptance by the local Conservation District Board of Supervisors and the local governing body of the appropriate county or municipality.
 - 11) Implementation of the results of the Designated Watershed or Subwatershed study will necessitate the development and implementation of a dedicated funding source such as a stormwater utility to ensure design, construction, and maintenance of needed structures is accomplished.
 - 12) Those watersheds or subwatersheds designated due to existing water quantity or water quality problems include the following:
 - A) Dover/Silver Lake/St. Jones River and all drainage areas upstream of the Silver Lake dam.

Section 10 - Specific Design Criteria and Minimum Standards and Specifications

- 1) General submission requirements for all projects requiring sediment and stormwater management approval include the following information:
 - A) A standard application form,
 - B) A vicinity map indicating north arrow, scale, and other information necessary to locate the property or tax parcel,
 - C) A plan at an appropriate scale accompanied by a design report and indicating at least:
 - i) Name and address of:
 - a) The owner of the property where the project is proposed;
 - b) The land developer; and
 - c) The applicant.
 - ii) The existing and proposed topography, as required on a case by case basis.
 - iii) The proposed grading and earth disturbance including:
 - a) Surface area involved; and
 - b) Limits of grading including limitation of mass clearing and grading whenever possible.
 - iv) Stormwater management and stormwater drainage computations, including:
 - a) Pre- and post-development velocities, peak rates of discharge, and inflow and outflow hydrographs of stormwater runoff at all existing and proposed points of discharge from the site,
 - b) Site conditions around points of all surface water discharge including vegetation and method of flow conveyance from the land disturbing activity, and

- c) Design details for structural controls.
 - v) Erosion, sediment control, and stormwater management provisions including:
 - a) Provisions to preserve top soil and limit disturbance;
 - b) Details of site grading, and;
 - c) Design details for structural controls which includes diversions and swales.
 - D) Federal Emergency Management Agency flood maps and federal and State protected wetlands, where appropriate.
 - E) The appropriate plan approval agency shall require that plans and design reports be sealed by a qualified design professional that the plans have been designed in accordance with approved sediment and stormwater ordinances, regulations, standards and criteria. The appropriate plan approval agency may waive this requirement on a case by case basis.
 - F) Additional information necessary for a complete project review may be required by the appropriate plan approval agency as deemed appropriate. This additional information may include items such as public sewers, water lines, septic fields, wells, etc.
- 2) Specific requirements for the erosion and sediment control portion of the sediment and stormwater management plan approval process include, but are not limited to, the following items. The appropriate plan approval agency may modify the following items for a specific project or type of project. Modification for a specific type of project will require the concurrence of the Department before that modification may be applied and that modification shall be subject to public review and comment prior to adoption.
- A) All plans shall include details of temporary and permanent stabilization measures including placement of the following statement on all plans submitted for approval. Following soil disturbance or redistribution, permanent or temporary stabilization shall be completed within 14 calendar days as to the surface of all perimeter sediment controls, topsoil stockpiles, and all other disturbed or graded areas on the project site. These requirements do not apply to those areas which are shown on the plan and are currently being used for material storage, or for those areas on which actual earth moving activities are currently being performed.
 - B) All ~~erosion and sediment control~~ plans shall ~~comply with~~ be consistent with the standards and specifications contained in the Delaware Erosion and Sediment Control Handbook, dated 1989 and approved supplements. The supplements shall be subject to public review and comment prior to their incorporation in the Erosion and Sediment Control Handbook.
 - C) A sequence of construction shall be contained on all plans describing the relationship between the implementation and maintenance of sediment controls, including permanent and temporary stabilization and the various stages or phases of earth disturbance and construction. The sequence of construction shall, at a minimum, include the following activities:
 - i) Clearing and grubbing for those areas necessary for installation of perimeter controls;
 - ii) Construction of perimeter controls;
 - iii) Remaining clearing and grubbing;
 - iv) Road grading;
 - v) Grading for the remainder of the site;
 - vi) Utility installation and whether stormdrains will be used or blocked until after completion of construction;
 - vii) Final grading, landscaping, or stabilization; and
 - viii) Removal of sediment controls.
 - D) The plans shall contain a description of the predominant soil types on the site, as described by the appropriate soil survey information available through the local Conservation District.
 - E) Unless an exception is approved on a case by case basis or an exception is approved for a specific type of activity by the appropriate plan approval agency, not more than 20 acres may be cleared at any one time. Once grading is initiated in one 20 acre section, a second 20 acre section may have stumps, roots, brush, and organic material removed. This will necessitate the phasing of construction on sites in excess of 20 acres to minimize areas exposed of ground cover and reduce erosion rates. Grading of the second 20 acre section may not proceed until temporary or permanent stabilization of the first 20 acre section is accomplished.
- 3) Specific requirements for the permanent stormwater management portion of the sediment and stormwater management plan approval process include, but are not limited to, the following items. The appropriate plan approval agency may modify the following items for a specific project or type of project. Modification for a

specific type of project will require the concurrence of the Department before the modification may be applied and the modification for a type of project shall be subject to public review and comment.

- A) It is the overall goal of the Department to ~~address utilize~~ stormwater management ~~on a watershed by watershed basis to provide a cost effective water quantity and water quality solution to the specific watershed problems~~ as a means to minimize water quantity and water quality impacts due to land disturbing activities and to mimic pre-development hydrology, to the maximum extent practicable, in regards to the rate, volume and duration of flow. These regulations will provide general design requirements that must be adhered to in the absence of Designated Watershed or Subwatershed specific criteria.
- B) All hydrologic computations shall be accomplished using the ~~methodologies from the~~ most recent U.S.D.A. ~~Soil Conservation Service~~ Natural Resources Conservation Service Technical Releases 20 or 55, or other methods as approved by the Department. The storm duration for computational purposes shall be the 24 hour rainfall event. For projects south of the Chesapeake and Delaware Canal, the Delmarva Unit Hydrograph shall be incorporated into the design procedure.
- C) Stormwater management requirements for a specific project shall be based on the entire area to be developed, or if phased, the initial submittal shall control that area proposed in the initial phase and establish a procedure and obligation for total site control.
- D) Water quantity control is an integral component of overall stormwater management. Control of peak discharges will, to some extent, prevent increases in flooding. The following design criteria for peak flow control is established for water quantity control purposes, unless a waiver is granted based on a case-by-case basis:
 - i) Projects in New Castle County that are located north of the Chesapeake and Delaware Canal shall not exceed the post-development peak discharge for the 2, 10, and 100 year frequency storm events at the pre-development peak discharge rates for the 2, 10, and 100 year frequency storm events.
 - ii) Projects in New Castle County that are located south of the Chesapeake and Delaware Canal, Kent County, and Sussex County shall not exceed the postdevelopment peak discharge for the 2 and 10 year frequency storm events at the predevelopment peak discharge rates for the 2 and 10 year frequency storm events.
 - iii) Watersheds, other than Designated Watersheds or Subwatersheds, that have well documented water quantity problems may have more stringent, or modified, design criteria that is responsive to the specific needs of that watershed. Modified criteria for that watershed must receive Departmental approval, and all projects reviewed and approved by the appropriate plan approval agency shall meet or exceed the modified criteria. Proposed modification of criteria for a watershed shall be subject to public review and comment prior to implementation.
- E) Water quality control is also an integral component of stormwater management. Control of ~~water quality runoff from small, frequent rainfall events~~ on-site will ~~prevent mitigate~~ further degradation of downstream water quality and habitat. The following design criteria ~~is are~~ established for water quality protection unless a waiver or variance is granted on a case-by-case basis.
 - i) In general, the preferred option for water quality protection shall be ~~ponds those practices collectively referred to as "Green Technology BMP's". Ponds having a permanent pool of water must be considered before a pond having no permanent pool. Infiltration~~ Other practices shall be considered only after ~~ponds preferred practices~~ have been eliminated for engineering or hardship reasons as approved by the appropriate plan approval agency.
 - ii) ~~Water quality ponds having a permanent pool shall be designed to release the first 1/2 inch of runoff from the site over a 24 hour period. The storage volume of the normal pool shall be designed to accommodate, at least, 1/2 inch of runoff from the entire site.~~
 - ii) Water quality practices shall be designed to manage the rate and volume of flow from the 2.0" NRCS Type II rainfall event, up to a maximum of 1.0" of runoff.
 - iii) ~~Water quality ponds, not having a normal pool, shall be designed to release the first inch of runoff from the site over a 24 hour period.~~
 - iii) Alternative stormwater quality practices may be acceptable to the Department and/or the plan approval agency if the removal efficiency for suspended solids meets or exceeds 80% as demonstrated by scientifically independent evaluation and monitoring performance data.

- ~~iv) Infiltration practices, when used, shall be designed to accept, at least, the first inch of runoff from all streets, roadways, and parking lots.~~
 - ~~iv) The Department and/or the plan approval agency may require other acceptable stormwater quality practices if a receiving waterbody has been identified as impaired, or designated with a specific pollutant reduction target necessary to meet State of Delaware water quality regulations.~~
 - ~~v) Other practices may be acceptable to the appropriate plan approval agency if they achieve an equivalent removal efficiency of 80% for suspended solids.~~
 - ~~v) Water quality practices may also be acceptable to the Department and the plan approval agency if they are designed to reduce pollutant loading from a specific postdevelopment source. The Department and/or the plan approval agency will determine if this criterion for water quality Best Management Practices is appropriate.~~
 - ~~vi) The Department will develop policy and maintain documentation related to the performance of water quality practices. The Department will also provide guidance for the design, appropriate use and required maintenance of water quality practices. These shall include structural and non-structural practices in addition to source reduction management strategies.~~
 - ~~vii) The Department and the plan approval agency will review the specific water quality practices proposed in a Sediment and Stormwater Management Plan, and review, approve or deny approval of the plan based on the criteria specified in Section E. of these regulations.~~
- F) All ponds that are constructed for stormwater management shall be designed and constructed in accordance with the U.S.D.A. Soil Conservation Service Small Pond Code 378, dated September, 1990, as approved for use in Delaware.
 - G) Any pond utilized for water supply purposes, or for irrigation, must obtain approval from the Department for that use pursuant to Chapter 60.
 - H) Where ponds are the proposed method of control, the developer shall submit to the approving agency, when required, an analysis of the impacts of stormwater flows downstream in the watershed for the 100 year frequency storm event. The analysis shall include hydrologic and hydraulic calculations necessary to determine the impact of hydrograph timing modifications of the proposed development, with and without the pond, on downstream dams, highways, structures, or natural points of constricted streamflows past which the timing effects would be considered negligible. The results of the analysis will determine the need to modify the pond design or to eliminate the pond requirement. Lacking a clearly defined downstream point of constriction, the downstream impacts shall be established, with the concurrence of the approving agency, downstream of a tributary of the following size:
 - i) The first downstream tributary whose drainage area equals or exceeds the contributing area to the pond; or
 - ii) The first downstream tributary whose peak discharge exceeds the largest designed release rate of the pond.
 - I) Where existing wetlands are intended as a component of an overall stormwater management system, the following criteria shall be adhered to:
 - i) The only disturbance to the wetland, for the purposes of these regulations, shall be that disturbance caused by the stormwater management pond embankment placement and construction; or
 - ii) The applicant can demonstrate that the intended or functional aspects of the stormwater management facility and wetlands are maintained or enhanced, or the construction in the wetland for stormwater management is the only reasonable alternative.
 - iii) All other necessary State and federal permits can be obtained.
 - J) Designs shall be in accordance with standards developed or approved by the Department, which are subject to public review and comment.
 - K) Ease of maintenance must be considered as a site design component. Access to the stormwater management structure must be provided for in the design, and land area adjacent to the structure must be set aside for disposal of sediments removed from the structure when maintenance is performed. The land set aside for pond maintenance shall be sized as follows:

- i) The set aside area shall accommodate at least 2% of the stormwater management basin volume to the elevation of the 2 year storage volume elevation;
 - ii) The maximum depth of the set aside volume shall be one foot;
 - iii) The slope of the set aside area shall not exceed 5%; and
 - iv) The area and slope of the set aside area may be modified if an alternative area or method of disposal is approved by the appropriate plan approval agency.
- L) A clear statement of defined maintenance responsibility shall be established during the plan review and approval process.
- M) All ponds shall have a forebay or other design feature to act as a sediment trap. A reverse slope bench must be provided one foot above the normal pool elevation for safety purposes and all embankment ponds, having a normal pool, shall have a drain installed to facilitate maintenance.
- N) The use of infiltration practices for the disposal of stormwater runoff is classified by the USEPA as an underground injection control practice, class V injection well. The appropriate plan approval agency shall forward a copy of all such approvals and the results of all construction inspections to the Department's Underground Injection Control program manager.
- O) Infiltration practices have certain limitations on their use on certain sites. These limitations include the following items:
 - i) Areas draining to these practices must be stabilized and vegetative filters established prior to runoff entering the system. Infiltration practices shall not be used if a suspended solids filter system does not accompany the practice. If vegetation is the intended filter, there shall be, at least, a 20 foot length of vegetative filter prior to stormwater runoff entering the infiltration practice;
 - ii) The bottom of the infiltration practice shall be at least three feet above the seasonal high water table, whether perched or regional, determined by direct piezometer measurements which can be demonstrated to be representative of the maximum height of the water table on an annual basis during years of normal precipitation, or by the depth in the soil at which mottling first occurs;
 - iii) The infiltration practice shall be designed to completely drain of water within 48 hours.
 - iv) Soils must have adequate permeability to allow water to infiltrate. Infiltration practices are limited to soils having an infiltration rate of at least 1.02 inches per hour. Initial consideration will be based on a review of the appropriate soil survey, and the survey may serve as a basis for rejection. On-site soil borings and textural classifications must be accomplished to verify the actual site and seasonal high water table conditions when infiltration is to be utilized.
 - v) Infiltration practices greater than three feet deep shall be located at least 20 feet from basement walls;
 - vi) Infiltration practices designed to handle runoff from impervious parking areas shall be a minimum of 150 feet from any public or private water supply well;
 - vii) The design of an infiltration practice shall provide an overflow system with measures to provide a non-erosive velocity of flow along its length and at the outfall; and
 - viii) The slope of the bottom of the infiltration practice shall not exceed five percent. Also, the practice shall not be installed in fill material as piping along the fill/natural ground interface may cause slope failure.
 - ix) Unless allowed on a specific project, infiltration practices will be used primarily for water quality enhancement only.
 - x) An infiltration practice shall not be installed on or atop a slope whose natural angle of incline exceeds 20%.
- P) A regional approach to stormwater management is an acceptable alternative to site specific requirements. As a substitute control practice, regional stormwater management structures shall be required to meet the following items:
 - i) They shall have a contributory drainage area not in excess of 400 acres unless, on a case by case basis, a larger drainage area is approved by the appropriate plan approval agency;
 - ii) They shall have a permanent pool of water and provide for 24 hour detention of the first inch of stormwater runoff from the entire upstream watershed; and
 - iii) All other necessary approvals have been obtained that could be cause for site rejection.

- Q) The pre-development peak discharge rate shall be computed assuming that all land uses in the site to be developed are in good hydrologic condition.

Section 11 - ~~General Permit Standard Plan~~ Criteria

- 1) ~~A general permit involves completion and submission of a form~~ Approval under this section involves submission of a standard plan by a land owner, developer, or agent to the appropriate plan approval agency ~~for signature~~. The minimum criteria for the ~~form standard plan~~ will be developed by the Department, and may be expanded upon by the appropriate plan approval agency. The ~~form standard plan~~ will contain standard conditions for erosion and sediment control that must be implemented on sites where a ~~specific control detailed plan~~ is not required. The appropriate plan approval agency shall approve or deny general permit standard plan requests within 5 14 calendar days of receipt.
- 2) The inclusion of an activity into the general permit standard plan classification does not relinquish that activity from the requirements of Chapter 40. Rather, the general permit standard plan precludes that activity from the necessity of a specific detailed plan review for each individual project.
- 3) Approval of a general permit standard plan does not relieve the applicant from the conditions that are a part of the general permit standard plan approval regarding the implementation of control practices as required by the general permit standard plan. Failure to implement control practices pursuant to conditions included in the general permit standard plan may necessitate appropriate enforcement action as provided in Chapter 40 and these regulations.
- 4) Those activities eligible for general permits standard plans include the following, when the stormwater management requirements have been waived in accordance with Section 3 of these Regulations:
 - A) Individual detached residential home or agricultural structure construction where the disturbed area for construction will be less than one acre in size. Two or more contiguous lots being developed concurrently by the same land developer will not be eligible for the general permit standard plan.
 - B) ~~Forest harvest operations.~~
 - B) Highway shoulder and side swale maintenance.
 - C) The repair, maintenance, and installation of above and underground utilities.
 - D) Minor Commercial, Institutional, and industrial projects where the total disturbed area will be less than one acre.
 - E) Modification or reconstruction of a tax ditch by a tax ditch organization when that tax ditch is not intended to serve new development, and which will not increase water quantity or adversely impact water quality, or change points of discharge so as to adversely affect the waters of the State.
- 5) The appropriate plan approval agency may place more restrictive conditions upon the general permits standard plan approval including the requirement for site-specific detailed plans for any general permits standard plan category. The imposition of more specific requirements for categories of projects shall be approved by the Department, and shall be subject to public review and comment prior to their imposition.

Section 12 - Certified Construction Reviewer Requirements

- 1) Projects reviewed and approved by the Department for sediment control and stormwater management, in general, shall have a certified construction reviewer when the disturbed area of the project is in excess of 50 acres. In addition any project, regardless of its size, may be required by the Department, or the appropriate plan approval agency, to have a certified construction reviewer on a case by case basis.
- 2) The Department or the appropriate inspection agency may require that any project, already under construction, have on site a certified construction reviewer if, on that project, significant sediment control or stormwater management problems necessitate more frequent inspections.
- 3) The certified construction reviewer shall function under the direction of a registered professional engineer licensed to practice engineering in the State of Delaware.
- 4) Individuals designated as certified construction reviewers shall attend and pass a Departmental sponsored or approved construction review training course. The course content will contain, at a minimum, information regarding the following items:
 - A) Basic hydrology and hydraulics;

- B) Soils information including texture, limitations, erodibility, and classifications;
 - C) Types of vegetation, growing times, and suitability;
 - D) Erosion, sediment control, and stormwater management practices;
 - E) Inspection and problem referral procedures;
 - F) Aspects of State law, regulations, local ordinances, and approval procedures: and
 - G) Sediment and stormwater management plan content.
- 5) The time frame for certification shall not exceed five years unless extended by the Department.
 - 6) The responsibility of the certified construction reviewer will be to ensure the adequacy of construction pursuant to the approved sediment and stormwater management plan.
 - 7) The certified construction reviewer shall be responsible for the following items:
 - A) Provision of a construction review of active construction sites on at least a weekly basis;
 - B) Within five calendar days, informing the person engaged in the land disturbing activity, and the contractor, by a written construction review report of any violations of the approved plan or inadequacies of the plan. The plan approval agency shall be informed, if the approved plan is inadequate, within five working days. In addition, the appropriate construction review agency shall receive copies of all construction review reports; and
 - C) Referral of the project through the delegated inspection agency to the Department for appropriate enforcement action if the person engaged in the land disturbing activity fails to address the items contained in the written construction review report. Verbal notice shall be made to the Department within two working days and written notice shall be provided to the Department within five working days.
 - 8) If the Secretary or his designee determines that a certified construction reviewer is not providing adequate site control or is not referring problem situations to the Department, the Secretary or his designee may suspend or revoke the certification of the construction reviewer.
 - 9) In any situation where a certified construction reviewer's approval is being suspended or revoked, an opportunity for hearing before the Secretary or his designee shall be provided. During any suspension or revocation, the certified construction reviewer shall not be allowed to provide construction reviews pursuant to these regulations. The minimum time of suspension or revocation shall be 6 months.

Section 13 - Contractor Certification Program

- 1) The Department shall require certification of responsible personnel for any foreman or superintendent who is in charge of on-site clearing and land disturbing activities for sediment and stormwater control associated with a construction project. Responsible personnel are not required on any project involving silvaculture or fewer than four residential homes. Responsible personnel shall obtain certification by completing a Department sponsored or approved training program. Enrollment of existing and future responsible personnel is the responsibility of employers. Response to a Department notice of training and certification in accordance with the provisions of item 3 of this section shall serve as an application for training. The Department shall notify employers of responsible personnel as to the date and location of training programs for attendance by responsible personnel and other interested persons.
- 2) After July 1, 1991, any applicant seeking sediment and stormwater plan approval shall certify to the appropriate plan approval agency that all responsible personnel involved in the construction project will have a certificate of attendance at a Departmental sponsored or approved training course for the control of sediment and stormwater before initiation of any land disturbing activity. The certificate of attendance shall be valid until the Department notifies the individual or announces in local newspapers that recertification is required due to a change in course content.
- 3) After July 1, 1991, employers of responsible personnel may receive interim certification for responsible personnel during the period before attendance at a Departmental sponsored or approved training course by submitting an enrollment form to the Department. Interim certification shall be valid until the scheduled date of attendance for training of responsible personnel. These enrollment forms are available from the Department and the Conservation Districts.

Section 14 - Construction Review and Enforcement Requirements

- 1) The land developer shall request, at least 24 hours ahead of time, that the appropriate inspection agency approve work completed at the stages of construction outlined in the sequence of construction contained on the approved plans. Any portion of the work which does not comply will be promptly corrected by the developer after written notice by the appropriate inspection agency. The notice shall set forth the nature of corrections required and the time frame within which corrections must be made.
- 2) The land developer shall notify the appropriate inspection agency before initiation of construction and upon project completion when a final inspection will be conducted to ensure compliance with the approved sediment and stormwater management plan.
- 3) The responsible inspection agency shall, for inspection purposes, do all of the following items:
 - A) Ensure that the approved sediment and stormwater management plans are on the project site and are complied with;
 - B) Ensure that every active site is inspected for compliance with the approved plan on a regular basis;
 - C) Prepare and leave on site, or forward to the contractor, a written report after every inspection that describes:
 - i) The date and location of the site inspection;
 - ii) Whether the approved plan has been properly implemented and maintained;
 - iii) Approved plan or practice deficiencies; and
 - iv) The action taken.
 - D) Notification of on-site personnel or the owner/developer in writing when violations are observed, describing the:
 - i) Nature of the violation;
 - ii) Required corrective action; and
 - iii) Time period for violation correction.
- 4) The Department may investigate complaints or refer any complaint received to the local inspection agency if the activity is located in a jurisdiction that has received delegation of sediment and stormwater management inspection. In conjunction with a referral, the Department may also initiate an on-site investigation after notification of the local inspection agency in order to properly evaluate the complaint. The Department shall take enforcement action when appropriate, and notify the local inspection agency in a timely manner of any enforcement actions taken.
- 5) The Department, at its discretion and upon notification to either the owner, developer, or contractor, may visit any site to determine the adequacy of sediment and stormwater management practices. In the event that the Department conducts site inspections, the appropriate inspection agency shall be notified prior to the initiation of any enforcement action. The appropriate inspection agency shall establish a time frame to obtain site compliance. This notification shall, in no way limit the right to the Department to take action subsequent to any provision of these regulations or Chapter. Formal procedures for interaction between the Department and the appropriate inspection agency on site inspection and referral will be developed on an individual basis.
- 6) The appropriate plan approval agency may require a revision to the approved plans as necessary due to differing site conditions. The appropriate plan approval agency shall establish guidelines to facilitate the processing of revised plans where field conditions necessitate plan modification. Where changes to the approved plan are necessary those changes shall be in accordance to the following:
 - A) Major changes to approved sediment and stormwater management plans, such as the addition or deletion of a sediment basin, shall be submitted by the owner/developer to the appropriate plan approval agency for review and approval.
 - B) Minor changes to sediment and stormwater management plans may be made in the field if approved by the construction reviewer and documented in the field review report. The appropriate inspection agency shall develop a list of allowable field modifications for use by the construction reviewer.
- 7) Stormwater management construction shall have inspections accomplished at the following stages:
 - A) Infiltration practices shall be inspected at the commencement, during, and upon completion of construction;
 - B) All ponds shall be inspected at the following stages:
 - i) Upon completion of excavation to sub-foundation and where required, installation of structural supports or reinforcement for structures, including, but not limited to;
 - a) Core trenches for structural embankments,

- b) Inlet-outlet structures and anti-seep structures, watertight connectors on pipes, and
 - c) Trenches for enclosed storm drainage facilities.
 - ii) During placement of structural fill, concrete, and installation of piping and catch basins;
 - iii) During backfill of foundations and trenches;
 - iv) During embankment construction; and
 - v) Upon completion of final grading and establishment of permanent vegetation.
- 8) The agency responsible for construction review may, in addition to local enforcement options, refer a site violation to the Department for additional enforcement action.
- 9) Referral of a site violation to the Department may initiate a Departmental construction review of the site to verify site conditions. That construction review may result in the following actions:
 - A) Notification through appropriate means to the person engaged in a land disturbing activity and the contractor to comply with the approved plan within a specified time frame; and
 - B) Notification of plan inadequacy, with a time frame for the person engaged in a land disturbing activity to submit a revised sediment and stormwater plan to the appropriate plan approval agency and to receive its approval with respect thereto. The Department shall notify the local inspection agency in a timely manner of what enforcement action is taken on the site.
- 10) Failure of the person engaged in the land disturbing activity or the contractor to comply with Departmental requirements may result in the following actions in addition to other penalties as provided in Chapter 40.
 - A) The Department shall have the power to issue a cease and desist order to any person violating any provision of Chapter 40 and these regulations by ordering such person to cease and desist from any site work activity other than those actions necessary to achieve compliance with any administrative order.
 - B) The Department may request that the appropriate plan approval agency refrain from issuing any further building or grading permits to the person having outstanding violations until those violations have been remedied.

Section 15 - Maintenance Requirements

- 1) For erosion and sediment control, all practices shall be maintained in accordance with requirements specified in the Delaware Sediment and Erosion Control Handbook dated 1989 or as directed by the construction reviewer.
- 2) Prior to the issuance of any building or grading permit for which stormwater management is required, the responsible plan approval agency shall require the applicant or owner to execute an inspection and maintenance agreement binding on all subsequent owners of land served by the private stormwater management facility. Such agreement shall provide for access to the facility at reasonable times for regular inspection by an inspection agency and for an assessment of property owners to ensure that the stormwater management structure is maintained in proper design working condition.
- 3) The Department encourages, and will provide technical assistance to, any Conservation District or local jurisdiction who chooses to assume the maintenance responsibility for stormwater management structures on, at least, residential lands. Public maintenance provides a reasonable assurance that maintenance will be accomplished on a regular basis.
- 4) The owner or person responsible shall perform or cause to be performed preventive maintenance of all completed stormwater management practices to ensure proper functioning. The responsible inspection agency shall ensure preventive maintenance through inspection of all stormwater management practices. The inspections shall occur at least once each year.
- 5) Inspection reports shall be maintained by the responsible inspection agency on all detention and retention structures and those inspection reports shall include the following items:
 - A) The date of inspection;
 - B) The name of the inspector;
 - C) The condition of:
 - i) Vegetation,
 - ii) Fences,
 - iii) Spillways,
 - iv) Embankments,
 - v) Reservoir area,

- vi) Outlet channels,
 - vii) Underground drainage,
 - viii) Sediment load, or
 - ix) Other items which could effect the proper function of the structure.
- D) Description of needed maintenance.
- 6) Responsible inspection agencies shall provide procedures to ensure that deficiencies indicated by inspections are rectified. The procedures shall include the following:
- A) Notification to the person responsible for maintenance of deficiencies including a time frame for repairs;
 - B) Subsequent inspection to ensure completion of repairs; and
 - C) Effective enforcement procedures or procedures to refer projects to the Department if repairs are not undertaken or are not done properly.

Section 16 - Penalties

- 1) Any person who violates any rule, order, condition imposed in an approved plan or other provision of these regulations shall be fined not less than \$200 or more than \$2,000 for each offense. Each day that the violation continues shall constitute a separate offense. The Justice of the Peace Courts shall have jurisdiction of offenses brought under this subsection.
- 2) Any person who intentionally, knowingly, and after written notice to comply, violates or refuses to comply with any notice issued pursuant to these regulations shall be fined not less than \$500 or more than \$10,000 for each offense. Each day the violation continues shall constitute a separate offense. The Superior Court shall have jurisdiction of offenses brought under this subsection.

Section 17 - Hearings

The conduct of all hearings conducted pursuant to these regulations shall be in accordance with the relevant provisions of Delaware Code, Title 7, Chapter 60.

Section 18 - Severability

If any section, subsection, sentence, clause, phrase, or portion of these regulations are for any reason held invalid or unconstitutional by any court or competent jurisdiction, such provision and such holding shall not affect the validity of the remaining portions of these regulations.