

OFFICIAL  
TOWNSHIP OF OHIO  
ORDINANCE NO. 319

AN ORDINANCE OF THE TOWNSHIP OF OHIO, IN THE COUNTY OF ALLEGHENY, COMMONWEALTH OF PENNSYLVANIA, REPLACING ORDINANCE NO. 257 IN ITS ENTIRETY.

WHEREAS, the Township adopted a Stormwater Management Ordinance in August 2014; and

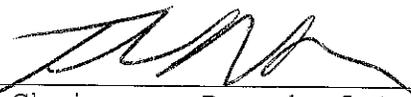
WHEREAS, it has been determined that certain changes should be made to the Stormwater Management Ordinance, and said Ordinance should be amended in the manner set forth below.

ORDAINED AND ENACTED this 9 day of September, 2015.

ATTEST:

TOWNSHIP OF OHIO

  
Secretary

  
Chairman, Board of Supervisors

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## ARTICLE I - GENERAL PROVISIONS

### Section 101. Short Title

This Ordinance shall be known and may be cited as the "Township of Ohio Stormwater Management Ordinance."

### Section 102. Statement of Findings

The governing body of the Municipality finds that:

- A. Stormwater runoff from lands modified by human activities threatens public health and safety by causing decreased infiltration of rainwater and increased runoff flows and velocities, which overtax the carrying capacity of existing streams and storm sewers, and greatly increases the cost to the public to manage stormwater.
- B. Inadequate planning and management of stormwater runoff resulting from land development and redevelopment throughout a watershed can also harm surface water resources by changing the natural hydrologic patterns, accelerating stream flows (which increase scour and erosion of stream-beds and stream-banks thereby elevating sedimentation), destroying aquatic habitat and elevating aquatic pollutant concentrations and loadings such as sediments, nutrients, heavy metals and pathogens. Groundwater resources are also impacted through loss of recharge.
- C. A program of stormwater management, including reasonable regulation of land development and redevelopment causing loss of natural infiltration, is fundamental to the public health, safety, welfare, and the protection of the people of the Municipality and all the people of the Commonwealth, their resources, and the environment.
- D. Stormwater can be an important water resource by providing groundwater recharge for water supplies and base flow of streams, which also protects and maintains surface water quality.

- E. Public education on the control of pollution from stormwater is an essential component in successfully addressing stormwater.
- F. Federal and state regulations require certain municipalities to implement a program of stormwater controls. These municipalities are required to obtain a permit for stormwater discharges from their separate storm sewer systems under the National Pollutant Discharge Elimination System (NPDES).
- G. Non-stormwater discharges to municipal separate storm sewer systems can contribute to pollution of waters of the Commonwealth by the Municipality.

### **Section 103. Purpose**

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

- A. Manage stormwater runoff impacts at their source by regulating activities that cause the problems.
- B. Provide review procedures and performance standards for stormwater planning and management.
- C. Utilize and preserve the existing natural drainage systems as much as possible.
- D. Manage stormwater impacts close to the runoff source, which requires a minimum of structures and relies on natural processes.
- E. Focus on infiltration of stormwater, to maintain groundwater recharge, to prevent degradation of surface and groundwater quality and to otherwise protect water resources.
- F. Maintain existing flows and quality of streams and watercourses.
- G. Meet legal water quality requirements under state law, including regulations at 25 Pa. Code Chapter 93.4a to

protect and maintain "existing uses" and maintain the level of water quality to support those uses in all streams, and to protect and maintain water quality in "special protection" streams.

- H. Prevent scour and erosion of stream banks and streambeds.
- I. Provide for proper operations and maintenance of all permanent stormwater management BMPs that are implemented in the Municipality.
- J. Provide a mechanism to identify controls necessary to meet the NPDES Permit requirements.
- K. Implement an illegal discharge detection and elimination program to address non-stormwater discharges into the Municipality's separate storm sewer system.

#### **Section 104. Statutory Authority**

The Municipality is empowered to regulate land use activities that affect stormwater impacts by the authority of the Second Class Township Code and the Stormwater Management Act, 32 P.S. Section 680.1 et seq.

#### **Section 105. Applicability**

- A. This Ordinance applies to any Earth Disturbance activities within the Municipality, and all stormwater runoff entering into the Municipality's separate storm sewer system from lands within the boundaries of the Municipality.
- B. Earth disturbance activities and associated stormwater management controls are also regulated under existing state law and implementing regulations. This Ordinance shall operate in coordination with those parallel requirements; the requirements of this Ordinance shall be no less restrictive in meeting the purposes of this Ordinance than state law.

### **Section 106. Repealer**

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

### **Section 107. Severability**

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

### **Section 108. Compatibility with Other Requirements**

- A. Approvals issued and actions taken under this Ordinance do not relieve the Applicant of the responsibility to secure required permits or approvals for activities regulated by any other code, law, regulation or ordinance. To the extent that this Ordinance imposes more rigorous or stringent requirements for stormwater management, the specific requirements contained in this Ordinance shall be followed.
- B. Nothing in this Ordinance shall be construed to affect any of the Municipality's requirements regarding stormwater matters which do not conflict with the provisions of this Ordinance, such as local stormwater management design criteria (e.g. inlet spacing, inlet type, collection system design and details, outlet structure design, etc.). Conflicting provisions in other municipal ordinances or regulations shall be construed to retain the requirements of this ordinance addressing State Water Quality Requirements.

## ARTICLE II - DEFINITIONS

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

- A. Words used in the present tense include the future tense; the singular number includes the plural, and the plural number includes the singular; words of masculine gender include feminine gender; and words of feminine gender includemasculinegender.
- B. The word "includes" or "including" shall not limit the term to the specific example but is intended to extend its meaning to all other instances of like kind and character.
- C. The words "shall" and "must" are mandatory; the words "may" and "should" are permissive.

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

**Accelerated Erosion** - The removal of the surface of the land through the combined action of human activities and the natural processes, at a rate greater than would occur because of the natural process alone.

**Applicant** - A landowner, developer or other person who has filed an application for approval to engage in any Regulated Earth Disturbance activity at a project site in the Municipality.

**BMP (Best Management Practice)** - Activities, facilities, designs, measures or procedures used to manage stormwater impacts from Regulated Earth Disturbance activities, to meet State Water Quality Requirements, to promote groundwater recharge and to otherwise meet the purposes of this Ordinance. BMPs include but are not limited to infiltration, filter strips, low impact design, bioretention, wet ponds, permeable paving, grassed swales, forested buffers, sand filters and detention basins.

**Cash Security** - Cash, certified check, or treasurer's check.

**Conservation District** - The Allegheny Conservation District.

**DEP** - The Pennsylvania Department of Environmental Protection.

**Design Storm** - The magnitude of precipitation from a storm event, measured in probability of occurrence, such as the 100-year storm and duration, such as 24-hour, and used in designing stormwater management control systems.

**Developer** - A person that seeks to undertake any Regulated Earth Disturbance activities at a project site in the Municipality.

**Development** - See "Earth Disturbance Activity." The term includes redevelopment.

**Development Site** - The specific tract of land where any Earth Disturbance activities in the Municipality are planned, conducted or maintained.

**Dye Test** - Any commonly accepted method of testing whereby dye is introduced into the storm, surface or subsurface water collection system and downspouts of structures or improvements to real property to determine if surface storm water is entering into the sanitary sewer system.

**Earth Disturbance Activity** - A construction or other human activity which disturbs the surface of the land, including, but not limited to, clearing and grubbing, grading, excavations, embankments, road maintenance, building construction and the moving, depositing, stockpiling, or storing of soil, rock or earth materials.

**Erosion** - The process by which the surface of the land, including channels, is worn away by water, wind, or chemical action.

**Erosion and Sediment Control Plan** - A plan for a project site which identifies BMPs to minimize accelerated erosion and sedimentation.

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

**Groundwater Recharge** - Replenishment of existing natural underground water supplies.

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

**Impervious Surface** - A surface that prevents the infiltration of water into the ground. Impervious surface includes, but is not limited to, any roof, parking or driveway areas, and any new streets and sidewalks. Any surface areas designed to initially be gravel or crushed stone shall be assumed to be impervious surfaces.

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

**Municipality** - Township of Ohio, Allegheny County, Pennsylvania.

**NPDES** - National Pollutant Discharge Elimination System, the federal government's system for issuance of permits under the Clean Water Act, which is delegated to DEP in Pennsylvania.

**Outfall** - The point or location at which stormwater leaves a site, which may include streams, storm sewers, swales or other well defined natural or artificial drainage features, as well as areas of dispersed overland flow.

**Person** - An individual, partnership, public or private association or corporation, or a governmental unit, public utility or any other legal entity whatsoever which is recognized by law as the subject of rights and duties.

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

**Project Site** - The specific area of land where any Regulated Earth Disturbance activities in the Municipality are planned, conducted or maintained .

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

**Redevelopment** - Earth Disturbance activities on land which has previously been disturbed or developed.

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

**Regulated Earth Disturbance Activity** - Earth disturbance activity one acre or more with a point source discharge to surface waters or the Municipality's storm sewer system, or five acres or more regardless of the planned runoff. This includes earth disturbance on any portion of, part, or during any stage of, a larger common plan of development. This only includes road maintenance activities involving 25 acres or more or earth disturbance.

**Road Maintenance** - Earth disturbance activities within the existing road cross-section, such as grading and repairing existing unpaved road surfaces, cutting road banks, cleaning or clearing drainage ditches and other similar activities.

**Runoff** - That part of precipitation that flows over the land.

**Separate Storm Sewer System** - A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels or storm drains) primarily used for collecting and conveying stormwater runoff.

**State Water Quality Requirements** - Qualified Person or Qualified Professional: Any person licensed by the Pennsylvania Department of State or otherwise qualified by law to perform the work required by this Ordinance.

- A. Each stream segment in Pennsylvania has a "designated use", such as "cold water fishery" or "potable water supply", which are listed in Chapter 93. These uses must be protected and maintained, under state regulations;
- B. "Existing uses" are those attained as of November 1975, regardless whether they have been designated in Chapter 93. Regulated Earth Disturbance activities must be designed to protect and maintain existing uses and maintain the level of water quality necessary to protect those uses in all streams, and to protect and maintain water quality in special protection streams; and
- C. Water quality involves the chemical, biological and physical characteristics of surface water bodies. After Regulated Earth Disturbance activities are complete, these characteristics can be impacted by addition of pollutants such as sediment, and changes in habitat through increase flow volumes and/or rates as a result of changes in land surface area from those activities. Therefore, permanent discharges to surface waters must be managed to protect the stream bank,

streambed and structural integrity of the waterway, to prevent these impacts.

**Stormwater** - The surface runoff generated by precipitation reaching the ground surface.

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

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

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

**Watercourse** - A channel or conveyance of surface water, such as a stream or creek, having defined bed and banks, whether natural or artificial, with perennial or intermittent flow.

**Watershed** - Region or area drained by a river, watercourse or other body of water, whether natural or artificial.

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

**Article III      STORMWATER PLAN CONTENT**

**Section 301.      Stormwater Plan Content**

- A. No final subdivision or land development plan shall be approved, no permit authorizing construction issued, or any earthmoving or land disturbance activity initiated until the final stormwater management plan for the development site is approved in accordance with the provisions of this Ordinance.
  
- B. A letter from the Allegheny County Conservation District (ACCD) approving the Erosion and Sedimentation Control Plan must also be received prior to the initiation of any grading. In the event that submission to the ACCD is not required by the Township, an Erosion and Sedimentation Control Plan prepared in accordance with the most recent version of PADEP Chapter 102, Erosion and Sedimentation Control Program Manual must be approved by the Township.
  
- C. Exemptions - The following activities are specifically exempt from this Ordinance:
  - 1. Use of land for gardening primarily for home consumption.
  
  - 2. Use of land for construction of landscaping improvements provided such improvements do not significantly alter the runoff characteristics for the land.
  
  - 3. Agricultural use of lands when operated in accordance with a farm conservation plan approved by the ACCD, or when it is determined by the ACCD that such use will not cause excessive erosion and sedimentation.
  
- D. The Stormwater Management Plan for all developments except small developments, as defined in 401.N, shall consist of the following four (4) components:
  - 1. Narrative Report: The Narrative Report shall consist of a general statement of the project giving the purpose and engineering assumptions and calculations for control measures and facilities. The following information shall be included.
    - (a) General description of the project.

- (b) General description of accelerated runoff control plan.
- (c) General description of erosion and sedimentation control plan.
- (d) Expected project time schedule, including anticipated start and completion dates.
- (e) Location and watershed characteristics.
- (f) Hydraulic and hydrologic calculations, methodology and basis of design.
- (g) Brief soils description.
- (h) The name, address, and phone number of consultant who prepared the stormwater management plan.
- (i) Stormwater management report date and date of the latest revision to the report.
- (j) Typewritten narrative report that shall include sections describing the following items:
  - [1] Stormwater management plan objectives.
  - [2] Hydrologic procedures used to develop plan.
  - [3] Description(s) of pre-development watershed conditions.
  - [4] Description(s) of post-development watershed conditions.
  - [5] Description(s) of proposed plan and method(s) to handle post-development runoff.
  - [6] Description(s) of proposed detention facility(s) and proposed outlet control.
  - [7] Summary tables for pre-development and post-development peak flows, detention facility(s) allowable release rates, stage-storage-outflow characteristics and storm-routing results.

- (k) Watershed maps delineating pre-development and post-development watershed boundaries, as well as the flow path and segments used to determine time of concentrations for each watershed.
- (l) Storm sewer calculations and watershed map delineating all sub-areas used to size and compute flow for storm sewer system.
- (m) Operation and Maintenance Program: The report shall contain a proposed maintenance plan for all stormwater control facilities, in accordance with the following:
  - (n) Identify the proposed ownership entity (e.g. Township, property owner, homeowner's association, other management entity.)
  - (o) A maintenance program for all facilities, outlining the type of maintenance activities, probable frequencies, personnel and equipment requirements, and estimated annual maintenance costs.

2. Preliminary Plan: The preliminary plan shall provide, and be accompanied by, maps and other descriptive material indicating the feasibility of the plan and showing the following:

- (a) A key map showing the development site's location within the designated watershed and watershed subsheds (consult watershed stormwater plans for boundaries). On all site drawings, show the boundaries of the watershed(s) and subarea(s) as they are located on the development site and identify the watershed names and/or subshed numbers.
- (b) Location of the 100-year floodplain on the development site based on the Ohio Township Flood Insurance Study Maps or a determination by the applicant's engineer.
- (c) An overlay showing soil types and boundaries within the development site.
- (d) The streets, storm sewers and other storm drains to be built, the basis of their design, the outfall and

outlet locations and elevations, the receiving stream or channel and its high water elevation and the functioning of the drains during high water conditions.

- (e) The parts of the proposed parking area pavements, if any, which are planned to be depressed to provide stormwater storage or conveyance. A maximum of six inches (6") depth of water may be ponded in a proposed parking area.
- (f) Existing streams and watercourses to be maintained and new channels to be constructed, their locations, cross-sections and profiles.
- (g) Proposed culverts and bridges to be built, if any, their materials, elevations, waterway openings and basis of design.
- (h) Existing detention ponds and basins to be maintained, enlarged or otherwise altered and new ponds or basins to be built and the basis of their design.
- (i) The approximate location and percentage of the total land area in the development which will be covered by impervious surfaces after construction is completed.
- (j) The slope, type and size of all proposed and existing storm sewers and other waterways.
- (k) Existing contours at intervals of two (2) feet except in areas with slopes greater than fifteen percent (15%), in which case five (5) foot contour intervals may be used.
- (l) All natural features, including bodies of water (natural and artificial), watercourses (permanent and intermittent), swales, wetlands and other natural drainage courses on the development site and those off-site which will be affected by runoff from the development.
- (m) Approximate depth, shape, size and storage of any proposed retention facility.
- (n) Infiltration BMPs shall be spread out and shallow as much as practicable.

- (o) One or more typical cross-sections of all existing and proposed channels or other open drainage facilities, showing the elevation of the existing land and the proposed changes thereto, together with the high water elevations expected from the 100-year storm under the controlled conditions called for by this Ordinance and the relationship of structures, streets and other utilities.
- (p) A site plan showing the property lines, dimensions of the site and location of existing and proposed structures, sewers, waterlines, easements and rights-of-way.
- (q) Certification of the registered PA engineer responsible for preparation of the plan.
- (r) A list of the permits and approvals relative to stormwater management that will be required from other governmental agencies and anticipated dates of submission and receipt. Copies of the applications may be requested by the Township Engineer where they may be helpful for the stormwater plan review.

3. Final Plan: Upon approval of the preliminary plan, the final plan shall be submitted to the Township. The final plan shall provide all descriptive material and maps previously submitted and required prior to the final plan, in addition to the following items:

- (a) All calculations, assumptions and criteria used in the design of the storm sewer system, detention facilities and sediment and erosion control operations. Hydraulic and energy grade lines shall be provided for proposed storm sewers if, in the opinion of the Township Engineer, they are required to evaluate the storm system.
- (b) All plans and profiles of proposed storm sewers and open channels, including horizontal and vertical controls, elevations, sizes, slopes and materials.
- (c) Locations, dimensions and design details required for the construction of all facilities.
- (d) For all detention basins, a plot or tabulation of storage volumes with corresponding water surface

elevations and basin outflow rates for those water surface elevations.

- (e) For all detention basins, design hydrographs of inflow and outflow for the peak design flows from the site under natural and developed conditions.
- (f) A description of operation for all detention basins.
- (g) Contours of the finished project site at intervals of two (2) feet, except in areas with slopes greater than fifteen percent (15%), in which case, five (5) foot contour intervals may be used.
- (h) The staging of earthmoving activities and program of operation, including a schedule for the installation of all temporary and permanent stormwater control measures and devices.
- (i) All information relative to the design and operation of emergency spillways.
- (j) Emergency routing of outfall for stormwater runoff in the event of failure of off-site drainage structures.
- (k) When major control facilities, such as retention basins, requiring a PADEP permit, are planned, soil structures and characteristics shall be investigated. Plans and data prepared by a licensed professional engineer or geologist with experience and education in soil mechanics shall be submitted. These submissions should consider and offer design solutions for frost heave potential, shrink/swell potential, soil bearing strength, water infiltration, soil settling characteristics, fill and backfilling procedures and soil treatment techniques as required to protect the improvements or structures.
- (l) All erosion and sedimentation control measures, temporary, as well as permanent, in sufficient detail to clearly indicate the effectiveness of the plan.
- (m) Project specifications relative to stormwater control, erosion and sedimentation.
- (n) Evidence that all on-site and off-site easements required to convey runoff flow to an existing public

drainage facility or a permanent stream have been granted to the operating entity.

- (o) Provide the information to conform with the requirements noted in Article V and VI.
- (p) Provide a list of adjacent property owners within 200 feet of the subject property and documentation that the adjacent property owners have been notified of the proposed project.
- (q) A note shall be placed on the recorded plan: "As per the approved Stormwater Management Plan, the Township shall have right of access to the onsite detention facility for the right of maintenance in the event the Owner, assigns or heirs do not adequately maintain the facility. The Owner, assigns or heirs shall reimburse the Township for all costs associated with said maintenance. The aforementioned rights granted the Township in no way diminish the responsibility of the Owner, assigns or heirs of said maintenance, and no liability will be assumed by the Township associated with required access for maintenance purposes."

4. Maintenance Plan and Agreement: A maintenance plan establishing ownership and maintenance responsibilities for all stormwater control facilities (identifying the specific person or entity responsible) and detailing financial requirements and sources of funding shall be submitted with the Final Plan. Any legal agreements or covenants required to implement the maintenance program shall be submitted (See Appendix 1). A Maintenance schedule shall be submitted in accordance with the Standardized Maintenance Schedule in Appendix 2.

#### **Section 302. General Standards.**

- A. The following provisions shall be considered the overriding performance standards against which all proposed stormwater control measures shall be evaluated:
- 1. Any landowner and any person engaged in the alteration or development of land which may affect stormwater runoff characteristics shall implement such measures as are reasonably necessary to prevent injury to health, safety and other property. Such measures

shall include, but not be limited to, such actions as are required to:

- (a) Assure that the maximum rate of stormwater runoff is no greater after development than prior to development activities.
- (b) Manage the quantity, velocity and direction of resulting stormwater runoff in a manner which will not adversely impact the health on, or value of, any affected properties.
- (c) No discharge of toxic materials into any stormwater management system will be permitted.
- (d) Where applicable stormwater management facilities shall comply with the requirements of Chapter 105 (Dam Safety and Waterway Management) of Title 25, Environmental Protection of the Pennsylvania Department of Environmental Protection (PADEP) and Section 404 of the Clean Water Act as authorized by the U. S. Corps of Engineers.
- (e) Stormwater management facilities that involve a state highway shall be subject to the approval of the Pennsylvania Department of Transportation.
- (f) Stormwater runoff from a project site shall flow directly into a natural watercourse or into an existing storm sewer system, or onto adjacent properties in a manner similar to the runoff characteristics of the pre-development flow.
- (g) Stormwater runoff shall not be transferred from one watershed to another unless the watersheds are sub-areas of a larger watershed that are tributary to a common point of interest within or near the perimeter of the property. Transfer of runoff from one watershed to another under any other circumstances shall only be approved at the discretion of the Township. Documentation shall be provided that peak flow rates are not increased following development and there will be no detrimental impact in downstream areas.

- (h) All stormwater runoff flowing over the project site shall be considered in the design of the stormwater management facilities.
- (i) For any stormwater management facility requiring a permit to be issued by PADEP, said permit along with supporting report and plans used to secure the permit shall also be submitted.

## 2. Fees and Expenses

- (a) The Township may charge a reasonable fee for review of BMP Operations and Maintenance Plans to defray review costs incurred by the Township. The Applicant shall pay all such fees.
- (b) The fees required by this Ordinance may cover:
  - [1] Administrative/Clerical Costs of 5%.
  - [2] The review of the BMP Operations and Maintenance Plan by the Township Engineer.
  - [3] The site inspections including, but not limited to, pre-construction meetings, inspections during construction of stormwater BMPs, and final inspection upon completion of the stormwater BMPs.
  - [4] Any additional work required to monitor and enforce any provisions of this Ordinance, correct violations, and assure proper completion of stipulated remedial actions.

## ARTICLE IV - STORMWATER MANAGEMENT FOR WATER QUALITY

### Section 401. General Requirements for Stormwater Management

All Regulated Earth Disturbance activities within the Municipality shall be designed, implemented, operated and maintained to meet the purposes of this Ordinance, through these two elements:

1. Erosion and Sediment control during the disturbance activities (e.g. during construction), and
  2. Water quality protection measures after completion of earth disturbance activities (e.g., after construction), including operations and maintenance.
- A. No Earth Disturbance activities within the Municipality shall commence until the requirements of this Ordinance are met.
- B. Impervious areas:
1. The measurement of impervious areas shall include all of the impervious areas in the total proposed development even if development is to take place in stages.
  2. For development taking place in stages, the entire development plan must be used in determining conformance with this Ordinance.
  3. For projects that add impervious area to a parcel, the total impervious area on the parcel is subject to the requirements of this Ordinance.
- C. Stormwater flows onto adjacent property shall not be created, increased, decreased, relocated, or otherwise altered without written notification of the adjacent property owner(s). Such stormwater flows shall be subject to the requirements of this Ordinance.
- D. SWM Site Plans approved by the municipality, in accordance with Section 301, shall be on site throughout the duration of the regulated activity.
- E. Erosion and sediment control during Regulated Earth

Disturbance activities shall be addressed as required by Section 405.

- F. Post-construction water quality protection shall be addressed as required by Section 406. Operations and maintenance of permanent stormwater BMPs shall be addressed as required by Article IV.
- G. All Best Management Practices (BMPs) used to meet the requirements of this Ordinance shall conform to the State Water Quality Requirements, and any more stringent requirements as determined by the Municipality.
- H. Infiltration BMPs should be spread out, made as shallow as practicable, and located to maximize use of natural on-site infiltration features while still meeting the other requirements of this Ordinance.
- I. Storage facilities should completely drain both the volume control and rate control capacities over a period of time not less than 24 and not more than 72 hours from the end of the design storm.
- J. The design storm volumes to be used in the analysis of peak rates of discharge should be obtained from the Precipitation-Frequency Atlas of the United States, Atlas 14, Volume 2, Version 3.0, U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Weather Service, Hydrometeorological Design Studies Ohio, Silver Spring, Maryland. NOAA's Atlas 145 can be accessed at: <http://hdsc.nws.noaa.gov/hdsc/pfds/>.
- K. Techniques described in Appendix A (Low Impact Development) of this Ordinance are encouraged, because they reduce the costs of complying with the requirements of this Ordinance and the State Water Quality Requirements.
- L. Additional Requirements
  - 1. In conjunction with meeting the requirements of this Ordinance, the Applicant shall refer to and meet all conditions and requirements set forth in the Township of Ohio's Municipal Separate Storm Sewer System (MS4) Prohibited Discharge Ordinance.

and meet all conditions and requirements set forth in the Township of Ohio's Total Maximum Daily Load (TMDL) Plan as adopted and revised.

M. Exemptions

1. Regulated activities that disturb areas less than 2,500 sq. ft. are exempt from the peak rate control and the SWM Site Plan preparation requirement of this Ordinance.
2. Agricultural activity is exempt from the rate control and SWM Site Plan preparation requirements of this Ordinance provided the activities are performed according to the requirements of 25 Pa. Code 102.
3. Forest management and timber operations are exempt from the rate control and SWM Site Plan preparation requirements of this Ordinance provided the activities are performed according to the requirements of 25 Pa. Code 102.
4. All Township development activities, Township road work, Township utility activities, and Public Works activities are exempt from this Ordinance in its entirety.
5. For a parcel or tract of land held under single ownership, only one (1) application for a small development, as defined above, shall be permitted before requiring a stormwater management plan for the entire parcel. A project cannot be phased to circumvent the stormwater requirements by using the exemption for small developments.

N. Small Developments

1. At the time of application, the Township Zoning Officer shall determine if the development qualifies as a "small development" and, therefore, is eligible for a simplified stormwater plan submission. For the purposes of this Chapter, a small development is:

- A. Any development which results (or will result when fully constructed) in the creation of 5,000 or less square feet of impervious surface area, including roofs, patios, driveways, and sidewalks.
  - B. The Township Engineer shall review the proposed provisions for stormwater management for small developments. The Township shall determine if the proposed development site is part of a larger parcel or tract for which a stormwater management plan was approved previously and, therefore, subject to any specific stormwater management controls contained in the prior plan.
  - C. For a parcel or tract of land held under single ownership, only one application for a small development, as defined above, shall be permitted before requiring a stormwater management plan for the entire parcel. A project cannot be phased to circumvent the stormwater requirements by using the exemption for small developments. When calculating new impervious area for determining whether a development qualifies as a "small development," the cumulative total of all impervious areas constructed within five years of the application date shall be considered.
2. The Small Project Stormwater Management Plan Application included in Appendix 5 may be used for projects under 5,000 square feet of proposed impervious surface. The Small Project Stormwater Management Plan Application allows documentation of new impervious surface, credits through disconnection of impervious surfaces and tree planting, and sizing of Volume Control BMPs and Rate Control facilities that may be required.
  3. Should the applicant choose not to use the

Small Project Stormwater Management Plan Application (Appendix 5), a plan addressing peak rate and volume controls must be submitted and shall include a plan which describes narratively and graphically, the type and location of proposed on-site stormwater management techniques or the proposed connection to an existing storm sewer system. The plan should show accurately site boundaries, 5-foot interval contours, location of watershed and/or subarea boundaries on the site (if applicable), and any watercourses, floodplains or existing drainage facilities or structures located on the site. Where the applicant is proposing to connect to an existing storm sewer, the applicant shall submit documentation showing that sufficient capacity exists in the storm sewer from the point of connection to the point of outlet in the natural drainage system. The plan and supporting documentation must be prepared by a registered professional engineer.

0. Volume Controls

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

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

- i. Do not increase the postdevelopment

total runoff volume for all storms equal to or less than the 2-year 24-hour duration precipitation.

ii. For modeling purposes:

1. Existing (predevelopment) nonforested pervious areas must be considered meadow or its equivalent.

2. 20% of existing impervious area, when present, shall be considered meadow in the model for existing conditions.

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

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

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

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

P. Rate Controls

1. Post-development discharge rates shall not exceed the predevelopment discharge rates for the 1-, 2-, 5-, 10-, 25-, 50-, and 100-year storms. If it is shown that the peak rates of discharge indicated by the post-development analysis are less than or equal to the peak rates of discharge indicated by the predevelopment analysis for 1-, 2-, 5-, 10-, 25-, 50-, and 100-year, 24-hour storms, then the requirements of this section have been met. Otherwise, the Applicant shall provide additional controls as necessary to satisfy the peak rate of discharge requirement.

Q. Design Storms

1. The SCS, Type II Rainfall Distribution shall be used for all analyses. The rainfall depth to be utilized for design storm frequencies shall be as follows:

Design Storm	Rainfall Depth 24 Hours
1 year	1.97 inches
2 year	2.35 inches
5 year	2.88 inches
10 year	3.30 inches
25 year	3.90 inches
50 year	4.40 inches
100 year	4.92 inches

2. Individual site standalone detention facilities shall be constructed for all single family lot developments or single family lots located in land developments which for terrain reasons cannot utilize the development's detention systems. Individual site standalone detention facilities shall consist of gravel filled sumps, ponds, tanks or other approved facilities, sized in accordance with standard details in the Township Construction Standards.
3. Storage volumes for total impervious areas greater than 5,000 square feet shall be calculated using the methods outlined this section.
4. All stormwater detention facilities shall be located at least ten (10) feet from foundation

walls in a location approved by the Township. All pipe from roof drains to a point ten (10) feet from the structure shall be a minimum Schedule 40 PVC pipe or approved equal.

5. Pre-development Conditions: The cover type for all sites will be considered to be the hydrologic conditions at the time of the development application. 20% of all existing impervious surface shall be considered meadow in good condition. All hydrologic parameters used to calculate peak flow rates shall use the appropriate specifications pertaining to these conditions.

#### R. Method of Computation

1. All computations used in conjunction with the analysis and design of stormwater management facilities shall be based on one (1) or more of the following methods:

F. TR-55-Soil Conservation Service Technical Release No. 55

G. TR-20-Soil Conservation Service Technical Release No. 20

H. Modified Rational Method

I. Penn State Runoff Model

J. Virginia Tech/Penn State Runoff Mode

K. These methods for determining peak discharge shall be used to:

Determine pre-development runoff conditions;

Analyze the impact of development; and

Perform calculations in the design of any detention/retention facilities used in controlling runoff.

2. These methods of runoff computation developed and used by the Soil Conservation Service and other authorities are hereby adopted by the Township.

3. The use of the Basic Rational Method in estimating runoff may be employed in the design of the storm sewer system within the development. The storm sewer system shall be interpreted as the conduits, culverts, inlets and appurtenant features for the conveying of stormwater to, through or from a development site to the point of final discharge or control facility. The Rational Method shall not be used in the analysis of stormwater runoff from the development in its entirety or in conjunction with the design of any retention/detention facilities or other runoff control measures.

#### S. Stormwater Detention Facilities

1. All detention facilities shall be equipped with multistage outlet structures to provide discharge control for the 1-, 2-, 5-, 10-, 25-, 50-, and 100-year storm frequencies. Provisions shall also be made for safely passing the post development one hundred-year storm runoff flows without damaging (i.e.: impairing the continued function of) the facilities.
2. Shared-storage facilities, which provide detention of runoff for more than one (1) development site, may be considered within a single subarea. Such facilities shall meet the design criteria contained in this section. In addition, runoff from the development sites involved shall be conveyed to the facility in a manner so as to avoid adverse impacts, such as flooding or erosion, to channels and properties located between the development site and the shared-storage facility.
3. Other considerations which should be incorporated into the design of the detention facilities include:
  - A. Inflow and outflow structures shall be designed and constructed to prevent erosion. Bottoms of impoundment-type structures shall be protected from soil erosion.
  - B. Control and removal of debris, both in the storage structure and in all inlet or outlet

devices, shall be a design consideration.

- C. Inflow and outflow structures, pumping stations and other structures shall be protected and designed to minimize safety hazards.
- D. Provide fencing at least four (4) feet in around the entire perimeter of all ponds/basins.
- E. Side slopes of storage ponds shall not exceed a ratio of three to one (3:1) horizontal to vertical dimension.
- F. Landscaping shall be provided for the facility which harmonizes with the surrounding area.
- G. All stormwater detention facilities shall be screened from view of existing roads or streets located within the Township, which is a minimum of 6-feet in height with sufficient access for maintenance vehicles. The screening material must be approved by the Township. Landscaping of the pond embankment shall not be permitted at any time.
- H. The facility shall be located to facilitate maintenance, considering the frequency and type of equipment that will be required. The facility shall be equipped with an access road at least ten (10) feet wide and with a maximum of grade of 15 percent.
- I. All pond outlet structures shall have suitable anti-seep collars, gaskets, barriers and/or seals to prevent leakage and piping of water through the pond embankment. All storm pipe installed through a pond embankment shall be constructed of reinforced concrete pipe.
- J. Provide a minimum of 1-foot of freeboard above the 100-year design storm event as it passes through the emergency spillway.
- K. A geotechnical investigation report for the construction of the stormwater detention/retention and infiltration facilities must be provided including design

recommendations for embankment construction, interior and exterior slopes, drainage swales and infiltration areas.

T. Single Family Lots:

- (a) Retention/detention facilities shall be constructed for all existing single family lot developments or single family lots located in land developments which for terrain reasons cannot utilize the development's retention/detention systems. Retention facilities shall consist of gravel filled sumps, ponds, tanks or other approved facilities, sized in accordance with standards of this Ordinance.
- (b) Storage volumes for roof areas greater than 5,000 square feet shall be calculated using the methods outlined in.

U. Easements:

- (a) Easements for stormwater management facilities shall be required to have a minimum width of twenty (20) feet. Where a subdivision or land development is, or will be, traversed by a watercourse, there shall be provided a stormwater or drainage easement of a width sufficient for the purpose, but not less than twenty (20) feet. The stormwater detention facilities must be provided within a drainage easement. An access easement must be provided from the public right-of-way to the stormwater detention facility with a minimum width of twenty (20) feet.

[1] Stormwater management easements are required for all areas used for off-site stormwater control, unless a waiver is granted by the Township.

[2] Stormwater management easements shall be provided by the property owner if necessary for (1) access for inspections and maintenance, or (2) preservation of stormwater runoff conveyance, infiltration, and detention areas and other BMPs, by persons other than the property owner. The

purpose of the easement shall be specified in any agreement under Section 505.

- [3] Facilities, areas, or structures used as Stormwater Management BMPs shall be enumerated as permanent real estate appurtenances and recorded as deed restrictions or conservation easements that run with the land.
- [4] Operation and Management Plans for stormwater management approved pursuant to 25 Pa. Code § 102 after the date of this Ordinance shall be recorded as a restrictive deed covenant that runs with the land.
- [5] If a conservation easement is provided the long term ownership, access, maintenance, and use restrictions must be identified on the recording plan.

V. Flood Prone Areas:

- (a) Land identified as flood-prone on maps issued by the Federal Insurance Administration shall be subject to the regulations of the National Flood Insurance Program and shall comply with the provisions of the Township Flood Plain Ordinance.
- (b) The 100 year floodplain shall be delineated by one of the following methods:
  - [1] The Flood Insurance Study (FIS) by the Federal Emergency Management Agency (FEMA).
  - [2] A hydrologic report prepared by an individual registered in the Commonwealth of Pennsylvania to perform such duties. Calculations and channel hydraulic characteristics used to determine floodplain limits shall be provided.
- (c) Municipal Liability Disclaimer: Approval of a stormwater management plan by the Township shall not be construed as an indication that said plan complies with the requirements, laws, or standards of any agency of the Commonwealth,

which may or may not govern said activity.

**Section 402. Permit Requirements by Other Government Entities**

The following permit requirements may apply to certain Regulated Earth Disturbance activities, and must be met prior to commencement of Regulated Earth Disturbance activities, as applicable:

- A. All regulated Earth Disturbance activities DEP subject to permit requirements by regulations under at 25 Pa. Code Chapter 102;
- B. Work within natural drainage ways subject to permit by DEP under 25 Pa. Code Chapter 105;
- C. Any stormwater management facility that would be located in or adjacent to surface waters of the Commonwealth, including wetlands, subject to permit by DEP under 25 Pa. Code Chapter 105.
- D. Any stormwater management facility that would be located on a State Highway right-of-way, or require access from a state highway, shall be subject to approval by the Pennsylvania Department of Transportation (PennDOT); and
- E. Culverts, bridges, storm sewers or any other facilities which must pass or convey flows from the tributary area and any facility which may constitute a dam subject to permit by DEP under 25 Pa. Code Chapter 105.

**Section 403 Construction Criteria for Stormwater Control Facilities.**

Stormwater management facilities shall be constructed in accordance with the following minimum specifications:

- A. All workmanship and materials shall conform to the Township Construction Standards as provided in Ohio Township Code, Chapter 180. In addition, all workmanship and materials shall conform to the latest edition of PennDOT Form 408.
- B. All connections to existing storm sewer pipes shall be made by construction of a suitable junction box (inlet or

manhole) to provide access for clean-out. No blind connections shall be permitted.

- C. All pond outlet structure pipes shall have suitable gaskets to prevent leakage and piping of water through the pond embankment.
- D. All pipe outlets shall discharge onto a stone rip-rap blanket to prevent erosion of soil. Rip-rap will be sized considering pipe exit velocities.
- E. Controls shall be installed at initial stages of earthmoving and otherwise as outlined in the staging of earthmoving activities section of the erosion and sedimentation control plan.
- F. The discharge of stormwater runoff shall be to a well-defined drainage course which has a defined bed and bank. If stormwater runoff cannot be discharged to a defined drainage course, documentation of written permission from each downstream property owner shall be provided for all properties between the source of discharge and the defined drainage course.

**Section 404 Maintenance Criteria for Stormwater Control Facilities.**

Maintenance is an essential part of the successful functioning of a stormwater management system and the following shall be required:

- A. Maintenance During Development: Maintenance during development of a project shall be the responsibility of the developer and/or landowner and shall usually include, but shall not be limited to:
  - (1) Removal of silt from all debris basins, traps or other structures or measures when forty percent (40%) of capacity is filled with silt.
  - (2) Disposal of collected silt in a manner which will not adversely affect the environment.
  - (3) Periodic maintenance of temporary control facilities such as replacement of straw bale dikes, straw filters or similar measures.

(4) Establishment or re-establishment of vegetation by seeding and mulching or sodding of scoured areas where vegetation has not been successfully established. A developer or landowner retains this obligation as to property he or she has developed or improved even if the proper season for "seeding" occurs initially sometime after the project is otherwise completed in whole or as to a particular phase.

(5) Installation of necessary controls sufficient to protect against problems caused by storm events within design frequencies.

(6) Removal of all temporary measures upon completion of the project.

B. After Acceptance of the Plan by the Township: In the event that the Township accepts public improvements in the plan, except in cases where an agreement between the developer and the Township have been executed to the contrary, the maintenance shall be the responsibility of the Township and shall include, where necessary:

(1) Mowing to maintain adequate stands of grass and to control weeds. Chemical weed control may be used if State and Township regulations are met. Selection of seed mixtures shall reflect the type of maintenance desired by the Township.

(2) Removal of silt from all permanent structures which trap silt or sediment to keep this material from building up in grassed waterways and other permanent structures, thereby reducing their capacity.

(3) Removal of trees and shrubs from pond embankments.

(4) Repair of animal burrows and removal of animals causing same.

C. If the Township does not accept the facilities, it shall be the responsibility of the Developer to inspect all permanent facilities to see that corrective action is taken where necessary.

(1) Stormwater facilities located on private property shall be maintained by the owner or his agent;

however, this does not relieve the owner or his agent of the obligation to inspect their own facilities. The Township reserves the right to enter upon private property to make periodic reasonable inspections and to require the owner to take necessary corrective actions. An easement shall be recorded granting access over private property to the stormwater facilities.

- (2) The Owner shall convey to the Township easements and/or rights-of-way to assure access for periodic inspections by the Township and maintenance if required.
- (3) The Owner shall keep on file with the Township the name, address and telephone number of the person or company responsible for maintenance activities; in the event of a change, new information will be submitted to the Township within ten (10) days of the change.
- (4) The Owner shall establish any special maintenance funds or other financing sources, in accordance with the approved maintenance plan.

D. The Owner shall pay the amount due to the Special Stormwater Facility Maintenance Fund.

- (1) Persons installing stormwater storage facilities will be required to pay a specified amount to the Ohio Township Stormwater Facility Maintenance Fund to help defray the costs of periodic inspections and annual maintenance expenses. The amount of the deposit shall be determined as follows:
  - (a) If the storage facility is to be privately owned and maintained, the deposit shall cover the cost of periodic inspections performed by the Township for a period of ten (10) years, as estimated by the Township. After that period of time, inspections will be performed by the Township and billed directly to the Owner.
  - (b) If the storage facility is to be Owned and maintained by the Township, the deposit shall cover the estimated annual costs for maintenance and inspections for ten (10) years, as estimated by the Township.

- (c) The amount of the deposit to the maintenance fund covering annual inspection and maintenance costs shall be converted to present worth of the annual series values. The Township Manager shall determine the present-worth equivalents, which shall be subject to the final approval of the Township Supervisors.
- (2) If the storage facility is proposed, which also serves as a recreation facility, such as a lake or ballfield, the Township may reduce or waive the amount of the maintenance fund based on the value of the land for public recreation purposes.
- (3) If at some future time any storage facility (whether publicly or privately owned) is eliminated due to the installation of storm sewers or another storage facility (i.e. a distributed storage facility), the unused portion of the maintenance fund will be applied to the cost of abandoning the facility and connecting to the storm sewer system or other facility. Any amount of the deposit remaining after the costs of abandonment are paid will be returned to the Owner.
- E. If the Owner fails to maintain the stormwater control facilities, following due notice by the Township to correct the problems, the Township shall perform the necessary maintenance or corrective work. The owner shall reimburse the Township for all costs.
- F. Additional items may be included in the maintenance agreement where determined necessary to guarantee the satisfactory maintenance of all facilities. The maintenance agreement shall be subject to the review and approval of the Township's Solicitor.

**Section 405. Erosion and Sediment Control During Regulated Earth Disturbance Activities**

- A. No Regulated Earth Disturbance activities within the Municipality shall commence until approval by the Municipality of an Erosion and Sediment Control Plan for construction activities.

- B. DEP has regulations that require an Erosion and Sediment Control Plan for any earth disturbance activity of 5,000 square feet or more, under 25 Pa. Code § 102.4(b).
- C. In addition, under 25 Pa. Code Chapter 92, a DEP "NPDES Construction Activities" permit is required for any earth disturbance one acre or more. This included earth disturbance on any portion of, part of or during any stage of a larger common plan of development.
- D. Evidence of any necessary permit (s) for Regulated Earth Disturbance activities from the appropriate DEP regional office or County Conservation District must be provided to the Municipality. The issuance of an NPDES Construction Permit (or permit coverage under the statewide General Permit (PAG-2)) satisfies the requirements subsection 405.A.
- E. A copy of the Erosion and Sediment Control plan and any required permit, as required by DEP regulations, shall be available at the project site at all times.
- F. A copy of the Erosion and Sediment Control Plan and any required permit, as required by PaDEP regulations, shall be available at the project site at all times.
- G. Measures shall be designed and used during construction as per approved plans from the ACCD and in accordance with the details presented in the PADEP Chapter 102 Revised Erosion and Sedimentation Control Program Manual. The following DEP Construction Details shall be included and made a part of the Construction Plans.
  - 1. Silt Barrier Fence
  - 2. Rock Construction Entrance
  - 3. Diversion Swale
  - 4. Sediment Trap Outlet
  - 5. Rock Filter
  - 6. Sediment Basin
  - 7. Soil Erosion Matting
- H. Evidence of any necessary permit(s) for Regulated Earth Disturbance activities from the appropriate DEP regional office of Allegheny County Conservation District must be provided to the Township. The issuance of an NPDES Construction Permit (or permit coverage under the statewide General Permit (PAG-2)) satisfies the requirements Subsection A.

- I. A copy of the Erosion and Sediment Control Plan and any required permit, as required by DEP regulations, shall be available at the project site at all times.

**Section 406. Water Quality Requirements After Regulated Earth Disturbance Activities Are Complete**

- A. No Regulated Earth Disturbance activities within the Municipality shall commence until approval by the Municipality of a plan which demonstrates compliance with State Water Quality Requirements after construction is complete.
- B. The BMPs must be designed, implemented and maintained to meet State Water Quality Requirements, and any other more stringent requirements as determined by the Municipality.
- C. To control post-construction stormwater impacts from Regulated Earth Disturbance activities, State Water Quality Requirements can be met by BMPs, including site design, which provide for replication of pre-construction stormwater infiltration and runoff conditions, so that post-construction stormwater discharges do not degrade the physical, chemical or biological characteristics of the receiving waters. As described in the DEP Comprehensive Stormwater Management Policy (#392-0300-002, September 28, 2002), this may be achieved by the following:
  - A. Infiltration: replication of pre-construction stormwater infiltration conditions;
  - B. Treatment: use of water quality treatment BMPs to ensure filtering out of the chemical and physical pollutants from the stormwater runoff; and
  - C. Streambank and Streambed Protection: management of volume and rate of post-construction stormwater discharges to prevent physical degradation of receiving waters (e.g., from scouring)
- D. DEP has regulations that require municipalities to ensure design, implementation and maintenance of Best Management Practices ("BMPs") that control runoff from new development and redevelopment after Regulated Earth Disturbance activities are complete. These requirements include the

need to implement post-construction stormwater BMPs with assurance of long-term operations and maintenance of those BMPs.

#### **Section 407. Stormwater Performance Standards**

- A. Applicants are encouraged to design conveyance systems that encourage infiltration and improve water quality wherever practicable.
- B. Wherever conveyance channels are necessary, drainage shall be maintained by an open channel with landscape banks designed to carry the 100-year, 24-hour stormwater runoff from upstream contributory areas. If the runoff from stormwater collection and conveyance facilities would drain over land to a stormwater detention facility, the 25-year frequency storm event may be used. All open channels shall be designed with one (1) foot of freeboard above the design energy gradeline of the design runoff condition.
- C. Flood relief channels shall be provided and designed to convey the runoff from the 100-year, 24-hour storm, such that this flow is conveyed to a natural drainage course with a defined bed and bank.
- D. The distance between manholes shall not exceed three hundred (300) feet apart for pipe sizes up to twenty-four (24) inches in diameter and not more than four hundred fifty (450) feet apart for larger pipe sizes. Inlet spacing shall not exceed 300 feet.
- E. Where drainage swales are used in lieu of or, in addition to, storm sewers, they shall be designed to carry the required runoff without erosion and in a manner not detrimental to the properties they cross. Drainage swales shall provide a minimum grade of one percent (1%) but shall not exceed a grade of nine percent (9%). Drainage swales used strictly for conveyance are not the same as Open Vegetated Channels.
- F. Use of grassed swales or open vegetated swales in lieu of curbing to convey, infiltrate and/or treat stormwater runoff from roadways is encouraged. Inlets shall be placed at the Ohio of the shoulder swale draining the street and shall be located no closer than four (4) feet from the edge of the cartway.

- G. Water Quality Inlets. Storm drainage systems that collect runoff from parking areas and/or loading areas exceeding 5,000 square feet of impervious coverage and discharge to stormwater management systems, including surface or subsurface infiltration systems, shall have a minimum of one (1) water quality inlet per each acre of drainage area. The purpose of water quality inlets is to remove oil, grease, and heavy particulates or total suspended solids, hydrocarbons and other floating substances from stormwater runoff. Methods other than water quality inlets may be permitted if the Applicant demonstrates to the Township's satisfaction that any such alternative will be as effective and as easily maintained. Periodic cleaning of these systems shall be addressed in the Operation and Maintenance Plan submitted to the Township.
- H. Suitable drainage structures, culverts, storm sewers, swales and related installations shall be provided along roads to insure removal of stormwater from all gutters, at all low points and at intervals elsewhere not exceeding 600-feet, such that the width of stormwater flow in any gutter does not exceed  $\frac{1}{4}$  of the total cartway width.
- I. No stormwater pipe (public or private) shall be less than 15-inches in diameter. All stormwater pipes shall be concrete unless otherwise approved by the Township. The minimum pipe slope shall be such that a minimum of 2 ft/sec velocity is maintained. Where a culvert or pipe is used to replace a stream, the cross-sectional area shall be at least as large as the original stream channel. All stormwater BMPs shall be constructed in accordance with the Township's "Standard Details". Minimum pipe cover shall conform to the Manufacturer's recommendations. Stormwater conveyance pipes utilized in BMPs shall have a pipe size of 4-inch diameter or larger.
- J. When requested by the Township the developers shall obtain or grant a minimum twenty (20) foot wide drainage easement over all storm sewers, drainage swales, channels, etc., that are a component of the stormwater management system when located within undedicated land. All permanent detention basins and/or other stormwater management facilities providing stormwater control for other than a single residential lot shall be located within a defined drainage easement that allows proper legal access and maintenance vehicle access.

- K. All stormwater collection and conveyance facilities (pipes, swales, and structures) shall be designed for a 100-year design storm event, unless the runoff would naturally drain overland to a stormwater detention facility, in which case a 25-year design storm event may be used. All drainage facilities shall be designed to contain the energy gradeline for the peak flow rate for the design storm within the structures a minimum of two (2) foot below surface elevation. The hydraulic grade line must be within the pipe. Swales and channels shall provide at least one foot of freeboard above the energy gradeline. Backwater effects of pipes discharging under surcharge conditions shall be included in the calculations.
- L. Where open watercourses for stormwater drainage are used the following standards shall apply:
- M. Artificial channels shall be of trapezoidal cross section, with the channel width at the bottom at least 10 times the maximum water depth which would be produced by the 100-year design storm and with rough, permeable and flexible sides and bottom. No artificial channel shall be used to replace a natural stream.
- N. At all points in the drainage system the velocity shall be less than the erosion threshold of the conveyance material, including at the outlet from the construction area or subdivision site.
- O. Provide a minimum of 1-foot of freeboard above the 25-year design storm event for drainage swales.
- P. All workmanship and materials shall conform to the latest edition of PennDOT Form 408 and be supplied by manufacturers of suppliers listed in PennDOT's Bulletin 15.
- Q. All connections to existing storm sewer pipes shall be made by construction of a suitable junction box (inlet or manhole) to provide access for cleanout. No blind connections shall be permitted.
- R. Manhole and inlet castings shall conform to the Pennsylvania Department of Transportation Form 408 and PennDOT Standards for Roadway Construction. Inlet grates shall be bicycle safe. Frames and grates shall be cast

iron or structural steel. Concrete frames shall not be permitted.

- S. All roof drains shall discharge to an on-lot sump, or to a storm sewer system which is controlled by a detention pond. Outlets from roof drain sumps shall not discharge directly to fill slopes. Outlets shall not discharge directly to the gutter line of any street. All pipes from roof drains shall be a minimum four-inch Schedule 40 ABS, PVC or SDR 26 pipe. Four-inch Schedule 40 PVC or ABS pipe is required for a distance of 10-feet from the foundation of the dwelling. No stormwater drainage system shall be permitted to be constructed through any curbing on any public street. Minimum pipe size for sump stormwater piping is four (4) inches.
- T. All bridges and culverts shall be designed to support expected loads and to carry expected flows and shall be designed to meet current standards of the Pennsylvania Department of Transportation. All bridges and culverts shall be subject to all permits required by the Pennsylvania Department of Environmental Protection, Bureau of Dams and Waterways.
- U. Evidence of any necessary permit (s) for Regulated Earth Disturbance activities from the appropriate DEP.
- V. Disposal of Stormwater from Roof and Driveway Drains:
- P. Unless otherwise approved by the Township, no stormwater from roofs or driveway drains shall be discharged to the street surface or curb underdrain.
- Q. Acceptable methods of disposal include properly designed dry sumps, grassed or other round surfaces with adequate consideration being given to erosion protection, storm sewers, or any other method approved by the Township
- R. BMP operations and maintenance requirements are described in Article V of this Ordinance.

**ARTICLE V - STORMWATER BMP OPERATIONS AND MAINTENANCE PLAN  
REQUIREMENTS**

**Section 501. General Requirements**

- A. No Regulated Earth Disturbance activities within the Municipality shall commence until approval by the Municipality of BMP Operations and Maintenance plan which describes how the permanent (e.g., post-construction) stormwater BMPs will be properly operated and maintained.
  
- B. The following items shall be included in the BMP Operations and Maintenance Plan:
  - 1. Map(s) of the project area, in a form that meets the requirements for recording at the offices of the Recorder of Deeds of Allegheny County, and shall be submitted on 24-inch x 36-inch or 30- inch x 42-inch sheets. The contents of the maps(s) shall include, but not be limited to:
    - a. Clear identification of the location and nature of permanent stormwater BMPs;
    - b. The location of the project site relative to highways, municipal boundaries or other identifiable landmarks;
    - c. Existing and final contours at intervals of two feet, or others as appropriate;
    - d. Existing streams, lakes, ponds or other bodies of water area; within the project site;
    - e. Other physical features including flood hazard boundaries, sinkholes, streams, existing drainage courses, and areas of natural vegetation to be preserved;
    - f. The locations of all existing and proposed utilities, sanitary sewers, and water lines within 50 feet of property lines of the project site;
    - g. Proposed final changes to the land surface and vegetative cover, including the type and amount of impervious area that would be added;

- h. Proposed final structures, roads, paved areas, and buildings;
- i. A twenty-foot wide access easement around all stormwater BMPs that would provide ingress to and egress from a public right-of-way;
- j. A description of how each permanent stormwater BMP will be operated and maintained, and identity of operations for the person(s) responsible for maintenance;
- k. The name of the project site, the name and address of the owner of the property, and the name of the individual or firm preparing the Plan; and
- l. A statement, signed by the landowner, that the acknowledging fixtures stormwater BMPs are can be altered that after or removed only by the Municipality approval.

**Section 502. Responsibilities for Operations and Maintenance of BMPs**

- A. The BMP Operations and Maintenance Plan for the project site shall establish responsibilities the permanent continuing operation and maintenance of all stormwater BMPs, as follows:
  1. If a Plan includes structures or lots which are to be separately owned and in which streets, sewers and other public improvements are to be dedicated to the Municipality, stormwater BMPs may also be dedicated to and maintained by the Municipality
  3. If a Plan includes operations and maintenance by a single ownership, or if sewers and other public improvements are to be privately owned and maintained, then the operation and maintenance of stormwater BMPs shall be the responsibility of the owner or private management entity, with all such maintenance to be carried out on such schedule and in such manner as the Township may direct by way of agreement or resolution.

- B. The Municipality shall make the final determination on the continuing operations and maintenance responsibilities. The Municipality reserves the right to accept or reject the operations and maintenance responsibility for any or all of the stormwater BMPs.

**Section 503. Municipality Review of BMP Operations and Maintenance Plan**

- A. The Municipality shall review the BMP Operations and Maintenance Plan for consistency with the purposes and requirements of this ordinance, and any permits issued by DEP.
- B. The Municipality shall notify the Applicant in writing whether the BMP Operations and Maintenance Plan is approved.
- C. The Municipality may require an "As-Built Survey" of all stormwater BMPs, and an explanation of any discrepancies with the Operations and Maintenance Plan.

**Section 504. Adherence to Approved BMP Operations and Maintenance Plan**

- A. It shall be unlawful to alter or remove any permanent stormwater BMP required by an approved BMP Operations and Maintenance Plan, or to allow the property to remain in a condition which does not conform to an approved BMP Operations and Maintenance Plan, unless an exception is granted in writing by the Municipality.

**Section 505. Operations and Maintenance Agreement for Privately Owned Stormwater BMPs**

- A. The property owner shall sign an operations and the maintenance agreement with Municipality covering all to be stormwater BMPs that are privately owned. The agreement shall be substantially the same as the agreement in Appendix 3 of this Ordinance.
- B. Other items may be included in the agreement where determined necessary to guarantee the satisfactory operation and maintenance of all permanent stormwater BMPs. The

agreement shall be subject to the review and approval of the Municipality.

#### **Section 506. Stormwater Management Easements**

- A. Stormwater management easements are required for all areas used for off-site stormwater control, unless a waiver is granted by the Municipal Engineer.
- B. Stormwater management easements shall be provided by the property owner if necessary for (1) access for inspections and maintenance, or (2) preservation of stormwater runoff conveyance, infiltration, and detention areas and other BMPs, by persons other than the property owner. The purpose of the easement shall be specified in any agreement under Section 405.

#### **Section 507. Recording of Approved BMP Operations and Maintenance Plan and Related Agreements**

- A. The owner of any land upon which permanent BMPs will be placed, constructed or implemented, as described in the BMP Operations and Maintenance Plan, shall record the following documents in the Office of the Recorder of Deeds for Allegheny County, within 15 days of approval of the BMP Operations Plan by the Municipality:
  - 1. The Operations and Maintenance Plan, or a summary thereof;
  - 2. Operations and Maintenance Agreements under Section 505; and
  - 3. Easements under Section 506.
- B. The Municipality may suspend or revoke any approvals granted for the project site upon discovery of the failure of the owner to comply with this Section.
- C. The owner shall provide a digital file, on state plain coordinate system, of the location of all BMP's constructed on the property.
- D. Prior to issuance of an Occupancy Permit or utilization of the proposed improvements the Applicant must provide the Township a copy of a recorded post-constructed stormwater

management plan and the proof of recording for any project containing stormwater management facilities including storm sewers and BMP's.

**Section 508. Municipal Stormwater BMP Operation and Maintenance Fund**

- A. If stormwater BMPs are accepted by the municipality for dedication, the Municipality may require persons installing stormwater BMPs to pay a specified amount to the Municipal Stormwater BMP Operation and Maintenance Fund, to help defray costs of operations and maintenance activities. The amount may be determined as follows :
  - 1. If the BMP is to be owned and maintained by the Municipality, the amount shall cover the estimated costs for operations and maintenance for ten (10) years, as determined by the Municipality; and
  - 2. The amount shall then be converted to present worth of the annual series values.
- B. If a BMP is proposed that also serves as a recreation facility (e.g. ball field, lake), the Municipality may adjust the amount due accordingly.
- C. All stormwater BMP's are to be inspected annually and during or immediately after the cessation of a 10-year or greater storm.

## **ARTICLE VI - INSPECTIONS AND RIGHT OF ENTRY**

### **Section 601. Inspections**

- A. DEP or its designees (e.g., County Conservation Districts) normally ensure compliance with any permits issued, including those for stormwater management. In addition to DEP compliance programs, the Municipality or its designee may inspect all phases of the construction, operations, maintenance and any other implementation of stormwater BMPs.
- B. During any stage of the Regulated Earth Disturbance activities, if the Municipality or its designee determines that any BMPs are not being implemented in accordance with this Ordinance, the Municipality may suspend or revoke any existing permits or other approvals until the deficiencies are corrected.

### **Section 602. Right of Entry**

- A. Upon presentation of proper credentials, duly authorized representatives of the Municipality may enter at reasonable times upon any property within the Municipality to inspect the implementation, condition, or operation and maintenance of the stormwater BMPs in regard to any aspect governed by this Ordinance.
- B. BMP owners and operators shall allow persons working on behalf of the Municipality ready access to all parts of the premises for the purposes of determining compliance with this Ordinance.
- C. Persons working on behalf of the Municipality shall have the right to temporarily locate on any BMP in the Municipality such devices as are necessary to conduct monitoring and/or sampling of the discharges from such BMP.
- D. Unreasonable delays in allowing the Municipality access to a BMP is a violation of this Article.

## **ARTICLE VII - FEES AND EXPENSES**

### **Section 701. General**

The Municipality may charge a reasonable fee for review of BMP Operations and Maintenance Plans to defray review costs incurred by the Municipality. The Applicant shall pay all such fees.

### **Section 702. Expenses Covered by Fees**

The fees required by this Ordinance may cover:

- A. Administrative/clerical Costs;
- B. The review of the BMP Operations and Maintenance Plan by the Municipal Engineer;
- C. The site inspections including, but not limited to, pre-construction meetings, inspections during construction of stormwater BMPs, and final inspection upon completion of the stormwater BMPs; and
- D. Any additional work required to monitor and enforce any provisions of this Ordinance, correct violations, and assure proper completion of stipulated remedial actions.

## ARTICLE VII - ENFORCEMENT AND PENALTIES

### Section 801. Public Nuisance

- A. The violation of any provision of this ordinance is hereby deemed a Public Nuisance.
- B. Each day that a violation continues shall constitute a separate violation.

### Section 802. Enforcement Generally

- A. Whenever the Municipality finds that a person has violated a prohibition or failed to meet a requirement of this Ordinance, the Municipality may order compliance by written notice to the responsible person. Such notice may require without limitation:
  - 1. The performance of monitoring, analyses, and reporting;
  - 2. The elimination of prohibited connections or discharges;
  - 3. Cessation of any violating discharges, practices, or operations;
  - 4. The abatement or remediation of storm water pollution or contamination hazards and the restoration of any affected property;
  - 5. Payment of a fine to cover administrative and remediation costs;
  - 6. The implementation of stormwater BMPs; and
  - 7. Operation and maintenance of stormwater BMPs.
- B. Such notification shall set forth the nature of the violation (s) and establish a time limit for correction of these violations (s). Said notice may further advise that, if applicable, should the violator fail to take the required action within the established deadline, the work will be done by the Municipality or designee and the expense thereof shall be charged to the violator.

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

**Section 803. Suspension and Revocation of Permits and Approvals**

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

1. Non-compliance with or failure to implement any provision of the permit;
2. A violation of any provision of this Ordinance; or
3. The creation of any condition or the commission of any act during construction or development which constitutes or creates a hazard or nuisance, pollution or which endangers the life or property of others.

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

1. The Municipal Engineer or designee has inspected and approved the corrections to the stormwater BMPs, or the elimination of the hazard or nuisance, and/or;
2. The Municipality is satisfied that the violation of the Ordinance, law, or rule and regulation has been corrected.

- C. A permit or approval which has been revoked by the Municipality cannot be reinstated. The applicant may apply for a new permit under the procedures outlined in this Ordinance.

**Section 804. Penalties**

- A. Any person violating the provisions of this ordinance shall be guilty of a misdemeanor, and upon conviction shall be subject to a fine of not more than \$1,000.00 for each violation, recoverable with costs, or imprisonment of not

more than 90 days, or both . Each day that the violation continues shall be a separate offense.

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

### **Section 805. Appeals**

Any person aggrieved by any action of the Municipality or its designee, relevant the provisions of this ordinance, may appeal to the relevant judicial or administrative body according to law, within the time period allowed.

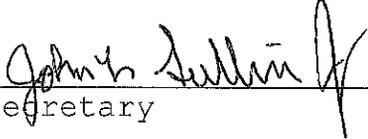
### **Section 806. References**

- A. Pennsylvania Department of Environmental Protection. No. 363-0300-002 (December 2006), as amended and updated. *Pennsylvania Stormwater Best Management Practices Manual*. Harrisburg, PA.
- B. Pennsylvania Department of Environmental Protection. No. 363-2134-008 (April 15, 2000), as amended and updated. *Erosion and Sediment Pollution Control Program Manual*. Harrisburg, PA.

ENACTED and ORDAINED at a regular meeting of the Board of Supervisors of the Township of Ohio on the 9th of September, 2015. This Ordinance shall take effect immediately.

ATTEST:

TOWNSHIP OF OHIO

  
Secretary

  
Chairman, Board of Supervisors

I hereby certify that the foregoing Ordinance was advertised in The Citizen on August 21<sup>st</sup> and 28<sup>th</sup>, 2015, a newspaper of general circulation in the municipality and was duly enacted and approved as set forth at a regular meeting of the municipality's governing body held on September 9<sup>th</sup>, 2015.

**Stormwater Management  
Appendix 1**

**Standard Schedule for Maintenance of  
Stormwater Management Facilities**

The Stormwater Management Plan developed for the Project is supplemented by this Maintenance Plan to help ensure continuing operations of all stormwater facilities.

The following is a list of items that shall be inspected and corrective action taken by the Owner:

Note: Owner refers to individual ultimately responsible for storm facility condition and function.

1. outlet conditions in Detention Facility.
2. storm sewer, swales, concrete gutters and other conveyance devices.
3. catch basins, manholes and other stormwater catchment/transition structures.
4. access for maintenance.

The following actions will be taken by the Owner to help ensure the facilities shown on the plan and identified above are in working order:

1. Replace or repair facilities so as to function as intended.
2. Remove silt debris and trash in catch basin/storm sewers.
3. Repair outlet structures.
4. Remove any silt, debris and trash in Detention Facility.
5. Disposal of collected silt, debris and trash in a manner which will not adversely affect the environment.
6. Replace eroded material and re-vegetate eroded areas. Seed and mulch disturbed areas.

The corrective actions to be taken are not limited to those listed above.

## **Stormwater Facilities Maintenance Plan**

The inspection shall be undertaken by a minimum of two (2) persons at least two (2) times per year on or before March 1<sup>st</sup> and October 1<sup>st</sup>. Additional inspections will be required if it becomes apparent facilities are not functioning properly. Corrective actions will then be taken within thirty (30) days of the discovery of the deficiencies as required to help ensure continuing operation of stormwater facilities. Any deficiencies noted in items inspected by the Owner shall be documented and corrective actions taken by the Owner. This recommended Maintenance Plan shall not be considered a guarantee as to the adequacy of the stormwater management facilities in the future.

Ohio Township may require other items to be included in the agreement where determined necessary to guarantee the satisfactory maintenance of all facilities. If stormwater facilities are not maintained by Ohio Township, the Owner shall maintain all facilities in accordance with the approved maintenance schedule and shall keep all facilities maintained in a safe and attractive manner. The Owner shall convey to Ohio Township easements and/or rights-of-way to assure access for periodic inspections by Ohio Township and maintenance if required. The Owner shall keep on file with Ohio Township the name, address and telephone number of the person or company responsible for maintenance activities and an as-built drawing of all stormwater facilities. In the event of a change, new information will be submitted to Ohio Township within ten (10) days of the change. The Owner shall establish any special maintenance funds or other financing sources, in accordance with the approved maintenance plan. If the Owner fails to maintain the stormwater control facilities, following due notice (30 days) by Ohio Township to correct deficiencies, Ohio Township shall perform the necessary maintenance or corrective work. The Owner shall reimburse Ohio Township for all costs associated with the required maintenance of the stormwater control facilities.

## APPENDIX 2

### LOW IMPACT DEVELOPMENT PRACTICES

#### ALTERNATIVE APPROACH FOR MANAGING STORMWATER RUNOFF

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

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

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

**Preserving Natural Drainage Features.** Protecting natural drainage features, particularly vegetated drainage swales and channels, is desirable because of their ability to infiltrate and attenuate flows and to filter pollutants. However, this objective is often not accomplished in land development. In fact, commonly held drainage philosophy encourages just the opposite pattern streets and adjacent storm sewers typically are located in the natural headwater valleys and swales, thereby replacing natural drainage functions with a completely impervious system. As a result, runoff and pollutants generated from impervious surfaces flow directly into storm sewers with no opportunity for

attenuation, infiltration, or filtration. Developments designed to fit site topography also minimizes the amount of grading on site.

- **Protecting Natural Depression Storage Areas.** Depressional storage areas have no surface outlet, or drain very slowly following a storm event. They can be commonly seen as ponded areas in farm fields during the wet season or after large runoff events. Traditional development practices eliminate these depressions by filling or draining, thereby obliterating their ability to reduce surface runoff volumes and trap pollutants. The volume and release-rate characteristics of depressions should be protected in the design of the development site. The depressions can be protected by simply avoiding the depression or by incorporating its storage as additional capacity in required detention facilities.
- **Avoiding introduction of impervious areas.** Careful site planning should consider reducing impervious coverage to the maximum extent possible. Building footprints, sidewalks, driveways and other features producing impervious surfaces should be evaluated to minimize impacts on runoff.
- **Reducing the Hydraulic Connectivity of Impervious Surfaces.** Impervious surfaces are significantly less of a problem if they are not directly connected to an impervious conveyance system (such as storm sewer). Two basic ways to reduce hydraulic connectivity are routing of roof runoff over lawns and reducing the use of storm sewers. Site grading should promote increasing travel time of stormwater runoff, and should help reduce concentration of runoff to a single point in the development.
- **Routing Roof Runoff Over Lawns.** Roof runoff can be easily routed over lawns in most site designs. The practice discourages direct connections of downspouts to storm sewers or parking lots. The practice also discourages sloping driveways and parking lots to the street, by routing roof drains and crowning the driveway to run off to the lawn, the lawn is essentially used as a filter strip.
- **Reducing the Use of Storm Sewers.** By reducing use of storm sewers for draining streets, parking lots, and back yards, the potential for accelerating runoff from the

development can be greatly reduced. The practice requires greater use of swales and may not be practical for some development sites, especially if there are concerns for areas that do not drain in a "reasonable" time. The practice requires educating local citizens and public works officials, who expect runoff to disappear shortly after a rainfall event.

- **Reducing Street Widths.** Street widths can be reduced by either eliminating on-street parking or by reducing roadway widths. Municipal planners and traffic designers should encourage narrower neighborhood streets which ultimately could lower maintenance.
- **Limiting Sidewalks to One Side of the Street.** A sidewalk on one side of the street may suffice in low-traffic neighborhoods. The lost sidewalk could be replaced with bicycle/recreational trails that follow back-of-lot lines. Where appropriate, backyard trails should be constructed using pervious materials.
- **Using Permeable Paving Materials.** These materials include permeable interlocking concrete paving blocks or porous bituminous concrete. Such materials should be considered as alternatives to conventional pavement surfaces, especially for low use surfaces such as driveways, overflow parking lots, and emergency access roads.
- **Reducing Building Setbacks.** Reducing setbacks reduces driveway and most entry walks and is along readily accomplished streets where traffic noise is low-traffic not a problem.
- **Construction Cluster Developments.** Cluster developments can also reduce the amount of impervious area for a given number of lots. The biggest savings is in street length, which also will reduce costs of the development. Cluster development clusters the construction activity onto less-sensitive areas without substantially affecting the gross density of development.

In summary, a careful consideration of the existing topography and implementation of a combination of the above mentioned techniques may avoid construction of costly stormwater control measures. Other benefits include reduced potential of downstream flooding, water quality degradation of receiving streams/water bodies and enhancement of aesthetics and reduction

of development costs. Beneficial results include more stable baseflows in receiving streams, improved groundwater recharge, reduced flood flows, reduced pollutant loads, and reduced costs for conveyance and storage.

**APPENDIX 3**

**STORMWATER BEST MANAGEMENT PRACTICES OPERATIONS AND MAINTENANCE AGREEMENT**

**THIS AGREEMENT**, made and entered into this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between \_\_\_\_\_, (hereinafter the "Landowner"), and \_\_\_\_\_ County, Pennsylvania, (hereinafter "Municipality");

**WITNESSETH**

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

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

**WHEREAS**, the SWM BMP Operation and Maintenance (O&M) Plan approved by the Municipality (hereinafter referred to as the "O&M Plan") for the property identified herein, which is attached hereto as Appendix A and made part hereof, as approved by the Municipality, provides for management of stormwater within the confines of the Property through the use of BMPs; and

**WHEREAS**, the Municipality, and the Landowner, his successors and assigns, agree that the health, safety, and welfare of the residents of the Municipality and the protection and maintenance of water quality require that on-site SWM BMPs be constructed and maintained on the Property; and

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

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

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

2. The Landowner shall operate and maintain the BMPs as shown on the SWM Plan in good working order in accordance with the specific operation and maintenance requirements noted on the approved O&M Plan.
3. The Landowner hereby grants permission to the Municipality, its authorized agents and employees, to enter upon the property, at reasonable times and upon presentation of proper credentials, to inspect the BMPs whenever necessary. Whenever possible, the Municipality shall notify the Landowner prior to entering the property.
4. In the event the Landowner fails to operate and maintain the BMPs per paragraph 2, the Municipality or its representatives may enter upon the Property and take whatever action is deemed necessary to maintain said BMP(s). It is expressly understood and agreed that the Municipality is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the Municipality.
5. In the event the Municipality, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Landowner shall reimburse the Municipality for all expenses (direct and indirect) incurred within 10 days of receipt of invoice from the Municipality.
6. The intent and purpose of this Agreement is to ensure the proper maintenance of the onsite BMPs by the Landowner; provided, however, that this Agreement shall not be deemed to create or affect any additional liability of any party for damage alleged to result from or be caused by stormwater runoff.
7. The Landowner, its executors, administrators, assigns, and other successors in interests, shall release the Municipality from all damages, accidents, casualties, occurrences, or claims which might arise or be asserted against said employees and representatives from the construction, presence, existence, or maintenance of the BMP(s) by the Landowner or Municipality.

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

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

ATTEST:

WITNESS the following signatures and seals:

(SEAL)

For the Municipality:

\_\_\_\_\_  
For the Landowner:

ATTEST:

\_\_\_\_\_ (City, Borough, Township)

County of \_\_\_\_\_, Pennsylvania

I, \_\_\_\_\_, a Notary Public in and for the county and state aforesaid, whose commission expires on the \_\_\_\_\_ day of \_\_\_\_\_, whose name(s) is/are signed to the foregoing Agreement bearing date of the \_\_\_\_\_ day \_\_\_\_\_, 20\_\_\_\_, has acknowledged the same before me in my said county and state.

**GIVEN UNDER MY HAND THIS** \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
NOTARY PUBLIC

(SEAL)

**Stormwater Management  
Appendix 4**

**Pollutant Loads from Specific Land Use**

<b>Worksheet 11 – BMPs for Pollution Prevention</b>		
<p>Does the site design incorporate the following BMPs to address nitrate pollution? A summary “yes” rating is achieved if at least 2 Primary BMPs are provided across the site. “Provided across the site” is taken to mean that the specifications for that BMP set forward in Chapters 5 and 6 are satisfied.</p>		
	<b>Yes</b>	<b>No</b>
<b>BMPs for Pollution Prevention:</b>	<input type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.4.1 – Protect Sensitive/Special Value Features	<input type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.4.2 – Protect/Conserve/Enhance Riparian Buffers	<input type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.4.3 – Protect/Utilize Natural Flow Pathways in Overall Stormwater Planning and Design	<input type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.5.1 – Cluster Uses at Each Site; Build on the Smallest Area Possible	<input type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.6.1 – Minimize Total Disturbed Area - Grading	<input type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.6.2 – Minimize Soil Compaction in Disturbed Areas	<input type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.6.3 – Re-Vegetate/Re-Forest Disturbed Areas (Native Species)	<input type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.7.1 – Reduce Street Imperviousness	<input type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.7.2 – Reduce Parking Imperviousness	<input type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.8.1 – Rooftop Disconnection	<input type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.8.2 – Disconnection from Storm Sewers	<input type="checkbox"/>	<input type="checkbox"/>
NS BMP 5.9.15 – Street Sweeping	<input type="checkbox"/>	<input type="checkbox"/>
Structural BMP 6.7.1 – Riparian Buffer Restoration	<input type="checkbox"/>	<input type="checkbox"/>
Structural BMP 6.7.2 – Landscape Restoration	<input type="checkbox"/>	<input type="checkbox"/>
Structural BMP 6.7.3 – Soils Amendment and Restoration	<input type="checkbox"/>	<input type="checkbox"/>

**Worksheet 12 – Water Quality Analysis of Pollutant Loading from All Disturbed Areas**

Total Site Area (AC)	
Total Disturbed Area (AC)	
Disturbed Area Controlled by BMPs (AC)	

**Total Disturbed Areas:**

	Land Cover Classification	Pollutant			Cover (Acres)	Runoff Volume (AF)	Pollutant Load		
		TSS EMC (mg/l)	TP EMC (mg/l)	Nitrate-Nitrite EMC (mg/l as N)			TSS** (LBS)	TP** (LBS)	NO <sub>3</sub> (LBS)
<b>Pervious Surfaces</b>	Forest	39	0.15	0.17					
	Meadow	47	0.19	0.3					
	Fertilized Planting Area	55	1.34	0.73					
	Native Planting Area	55	0.40	0.33					
	Lawn, Low-Input	180	0.40	0.44					
	Lawn, High-Input	180	2.22	1.46					
	Golf Course Fairway/Green	305	1.07	1.84					
	Grassed Athletic Field	200	1.07	1.01					
<b>Impervious Surfaces</b>	Rooftop	21	0.13	0.32					
	High Traffic Street/Highway	261	0.40	0.83					
	Medium Traffic Street	113	0.33	0.58					
	Low Traffic/Residential Street	86	0.36	0.47					
	Res. Driveway, Play Courts, etc.	60	0.46	0.47					
	High Traffic Parking Lot	120	0.39	0.60					
	Low Traffic Parking Lot	58	0.15	0.39					
<b>TOTAL LOAD</b>									
<b>REQUIRED REDUCTION (%)</b>							85%	85%	50%
<b>REQUIRED REDUCTION (LBS)</b>									

\*Pollutant Load = [EMC, mg/l] X [Volume, AF] X [2.7, Unit Conversion]

\*\*TSS and TP calculations only required for projects not meeting CG1/CG2 or not controlling less than 90% of the disturbed area

**Worksheet 13 – Pollutant Reduction Through BMP Applications\***

\*Fill this worksheet out for each BMP type with different pollutant removal efficiencies. Sum pollutant reduction achieved for all BMP types on final sheet.

BMP Type: \_\_\_\_\_

Disturbed Area Controlled by this BMPs  
(AC)

**Disturbed Area Controlled by this BMPs:**

	Land Cover Classification	Pollutant			Cover (Acres)	Runoff Volume (AF)	Pollutant Load**		
		TSS EMC (mg/l)	TP EMC (mg/l)	Nitrate-Nitrite EMC (mg/l as N)			TSS** (LBS)	TP** (LBS)	NO <sub>3</sub> (LBS)
Pervious Surfaces	Forest	39	0.15	0.17					
	Meadow	47	0.19	0.3					
	Fertilized Planting Area	55	1.34	0.73					
	Native Planting Area	55	0.40	0.33					
	Lawn, Low-Input	180	0.40	0.44					
	Lawn, High-Input	180	2.22	1.46					
	Golf Course Fairway/Green	305	1.07	1.84					
	Grassed Athletic Field	200	1.07	1.01					
Impervious Surfaces	Rooftop	21	0.13	0.32					
	High Traffic Street/Highway	261	0.40	0.83					
	Medium Traffic Street	113	0.33	0.58					
	Low Traffic/Residential Street	86	0.36	0.47					
	Res. Driveway, Play Courts, etc.	60	0.46	0.47					
	High Traffic Parking Lot	120	0.39	0.60					
	Low Traffic Parking Lot	58	0.15	0.39					
<b>TOTAL LOAD TO THIS BMP TYPE</b>									
<b>POLLUTANT REMOVAL EFFICIENCIES FROM APPENDIX A. STORMWATER MANUAL (%)</b>									
<b>POLLUTANT REDUCITON ACHIEVED BY THIS BMP TYPE (LBS)</b>									
<b>POLLUTANT REDUCTION ACHIEVED BY ALL BMP TYPES (LBS)</b>									
<b>REQUIRED REDUCTION from WS12 (LBS)</b>									

\*Pollutant Load = [EMC, mg/l] X [Volume, AF] X [2.7, Unit Conversion]

\*\*TSS and TP calculations only required for projects not meeting CG1/CG2 or not controlling less than 90% of the disturbed area

**APPENDIX 19-F**

**SMALL PROJECT STORMWATER MANAGEMENT PLAN APPLICATION**

**Small Project Stormwater Management Submission**

**Calculation of Impervious Area**

Per the Township Stormwater Management Ordinance, a stormwater management plan is required whenever more than 2,500 square feet of impervious surface is proposed. The calculations of proposed impervious area shall cumulatively include all new impervious area constructed within the last five years. The stormwater management plan must provide both volume controls and rate controls. An impervious surface is a surface that prevents the infiltration of water into the ground. Impervious surfaces (or areas) shall include, but not be limited to: roofs; additional indoor living spaces, patios, garages, storage sheds, driveways, porches, decks and similar structures; and any new streets or sidewalks.

Table 1: Calculation of Impervious Surfaces

Surface Type	Length	X	Width	=	Proposed Impervious Area
Building		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
Driveway		X		=	
		X		=	
		X		=	
Parking Areas		X		=	
		X		=	
		X		=	
Patios and Sidewalks		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
Other		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
<b>Total Impervious Surface Area to Manage</b>					

**If the Total Impervious Surface Area is LESS THAN 2,500 Square Feet, please read, acknowledge and sign below.**

**If the Total Impervious Surface Area EXCEEDS 2,500 Square Feet, complete the remainder of the Application.**

**If the Total Impervious Surface Area EXCEEDS 5,000 Square Feet, a complete stormwater management plan, prepared by a registered professional engineer must be submitted.**

Based Upon the information you have provided a *Stormwater Management Plan IS NOT required* for this regulated activity. Ohio Township may request additional information and/or SWM for any reason.

Property Owner Acknowledges that submission of inaccurate information may result in a stop work order or permit revocation. Acknowledgement of such is by signature below. I declare that I am the owner or owner's legal representative. I further acknowledge that the information provided is accurate and employees of Ohio Township are granted access to the above described property for review and inspection as may be required.

Property Owner \_\_\_\_\_

Date \_\_\_\_\_

**Volume Controls**

**Calculation of Required Capture Volume and Credit 1: Disconnection of Impervious Area**

When runoff from impervious areas is directed to a pervious area that allows for infiltration, filtration, and increased time of concentration (i.e. a vegetated filter strip), all or parts of the impervious areas may qualify as Disconnected Impervious Area (DIA). Using the criteria below, determine the portion of the impervious area that can be excluded from the calculation of total impervious area.

**Criteria:** An impervious area is considered to be completely or partially disconnected if it meets the requirements listed below:

1. Rooftop area draining to a downspout is less than 500 square feet.
2. Paved area draining to a discharge is less than 1000 square feet.
3. The flow path of the impervious area is not more than 75 feet.
4. The soil at the discharge area is not designated as hydrologic soil group "D".
5. The flow path at the discharge area has a positive slope of less than 5%.
6. A gravel strip or other spreading device is required at paved discharges.

Credit for disconnection of impervious areas shall be applied in accordance with the following table:

Table 2: DIA Credit Factors

Length of Pervious Flow Path from Discharge Point	DIA Credit Factor
---	-------------------

0-14	1
15-29	0.8
30-44	0.6
45-59	0.4
60-74	0.2
75 or more	0

Note: The flow plan cannot include impervious surfaces and must be at least 15 feet from any impervious surface.

Table 3: Calculation of Required Capture Volume

Surface Type	Impervious Area (from Table 1)	X	DIA Credit Factor	=	Impervious Area to be Managed	÷	6	=	Required Capture Volume
Building		X		=		÷	6	=	
		X		=		÷	6	=	
		X		=		÷	6	=	
		X		=		÷	6	=	
		X		=		÷	6	=	
Driveway		X		=		÷	6	=	
		X		=		÷	6	=	
		X		=		÷	6	=	
Parking Areas		X		=		÷	6	=	
		X		=		÷	6	=	
		X		=		÷	6	=	
Patios and Sidewalks		X		=		÷	6	=	
		X		=		÷	6	=	
		X		=		÷	6	=	
		X		=		÷	6	=	
		X		=		÷	6	=	
Other		X		=		÷	6	=	
		X		=		÷	6	=	
		X		=		÷	6	=	
		X		=		÷	6	=	
<b>Required Capture Volume</b>									

**Credit 2: Tree Planting**

Perhaps the best BMP is a tree as they intercept rainfall, increase evapotranspiration and increase time of concentration. A portion of the required capture volume can be reduced provided the criteria are met.

**Criteria**

To receive credit for planting trees, the following must be met:

1. Trees must be native species, minimum 2" caliper and 6 feet tall (min).
2. Trees shall be adequately protected during construction.
3. Trees shall be maintained until redevelopment occurs.
4. No more than 25% of the runoff volume can be mitigated through the use of trees.
5. Dead trees shall be replaced within 6 months.
6. Non-native species are not applicable.

**Credits**

Volume reduction credits may be applied as follows:

1. Deciduous Trees – 6 ft<sup>3</sup> per tree planted.
2. Evergreen Trees – 10 ft<sup>3</sup> per tree planted.

Table 4: Calculation of Tree Planting Credit

Type of Tree	Number of Trees	X	Reduction Factor	=	Tree Planting Credit
Deciduous Tree		x	6 ft <sup>3</sup>	=	
Evergreen Tree		x	10 ft <sup>3</sup>	=	
Tree Planting Credit (ft <sup>3</sup> )					

Table 5: Calculation of Total Capture Volume to be Managed

Total Required Capture Volume (Table 3)	-	Tree Planting Credit (Table 4)	=	Total Capture Volume to be Managed*
	-		=	

\*The Total Capture Volume to be Managed should inserted on the Small Project SWM Plan Worksheet.

## Small Project SWM Plan Worksheet

Based upon the information you have provided a **Stormwater Plan IS Required** for this development activity. The Township Stormwater Management Ordinance requires rate and volume controls be provided for developments resulting in the creation of greater than 2,500 square feet of impervious area.

Regulated activities shall be conducted only after the Township approves a stormwater management plan. The Township Stormwater Management Ordinance will assist you in preparing the necessary information and plans for the Township to review and approve. **This document will constitute an approved plan if all of the relevant details are to be installed in their entirety AND no part of the stormwater system adversely affects any other property, nor adversely affect any septic systems or drinking water wells on this, or any other, parcel.** If an alternative system is to be used a plan will need to be submitted to Ohio Township for approval. A design by a qualified professional may be required for more complex sites.

**PLEASE INITIAL BELOW TO INDICATE THE STORMWATER MANAGEMENT PLAN FOR THIS SITE**

Minimum Control #1: Erosion & Sediment Pollution Control  
 Minimum Control #2: Source Control of Pollution  
 Minimum Control #3: Preservation of Natural Drainage Systems and Outfalls

The relevant details from Township Stormwater Management Ordinance will be installed in their entirety AND the system will be located as not to adversely affect other property, nor any septic systems or drinking water wells on this, or any other, parcel.

To meet volume control requirements, the following will be installed and maintained:

Capture Volume to be Managed (ft3) (From Table 5)		X	Conversion	=	Surface Area of BMP (ft2)
	<b>Rain Garden</b> 6" Ponding, 2' Soil Depth	x	1.20	=	
	<b>Dry Well or Infiltration Trench</b> 2 1/2' Aggregate Depth	x	1.50	=	
	<b>Total</b>				

To meet rate control requirements, a gravel sump will be installed and maintained. The sump shall be sized per the following figure:

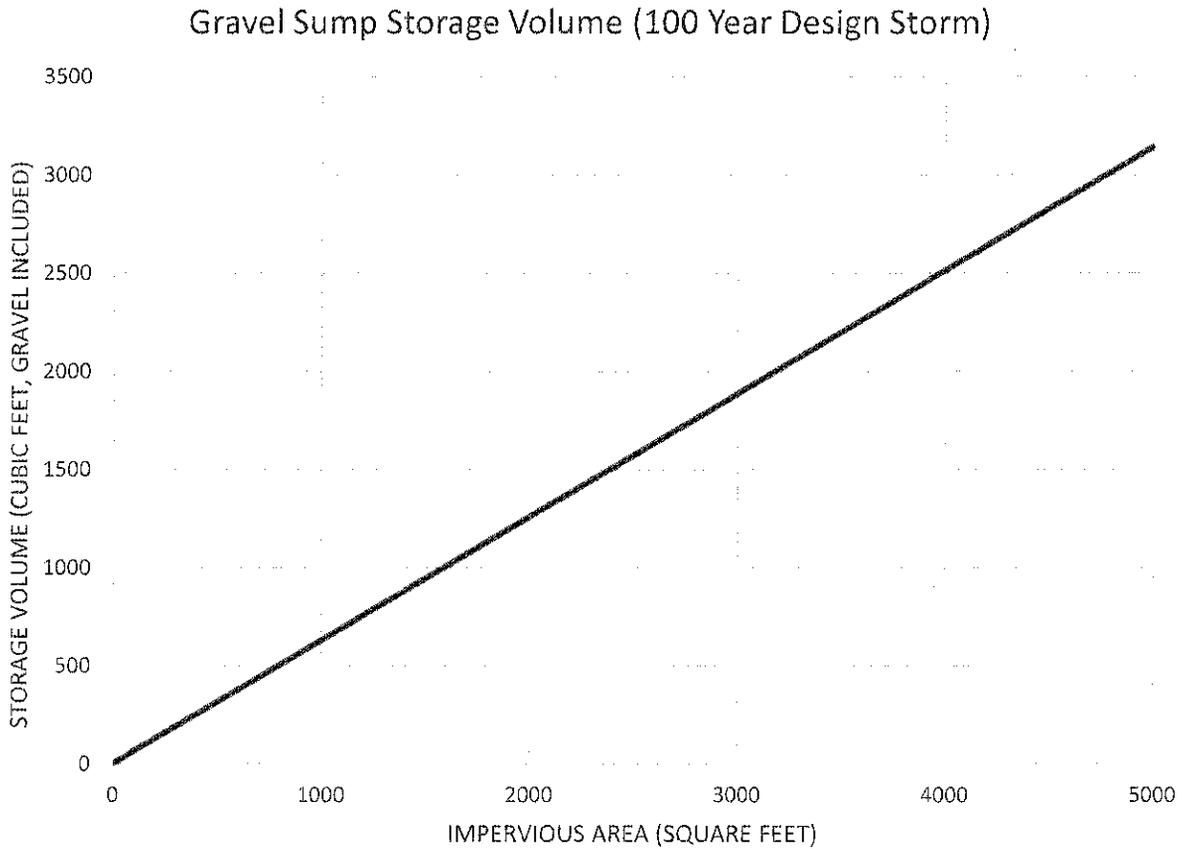


Figure 1: Gravel Sump Sizing Chart

Total Proposed ImperVIOUS Area: \_\_\_\_\_ square feet

Gravel Sump Storage Volume: \_\_\_\_\_ cubic feet



In lieu of meeting the above, an alternative and/or professional design is attached for approval AND the system will be location as not to adversely affect other property, any septic systems or drinking water wells on this, or any other, parcel.

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**Site Sketch Plan showing:**

- Property Lines with dimensions
  - Proposed buildings with dimensions
  - Proposed impervious surfaces with dimensions
  - Proposed sanitary sewer lateral or septic system, as applicable
  - Proposed water service or well site, as applicable
  - Proposed stormwater management system(s)
- 



**Operations and Maintenance Agreement**

- Execute and record a Stormwater Maintenance and Agreement (Refer to 19-D of the Township Stormwater Management Ordinance)
  - Payment has been made to the Township's Stormwater Facility Maintenance Fund. The initial deposit shall be in the amount of \$500 for developments proposing greater than 2,500 square feet. The minimum initial deposit when greater than 5,000 square feet is proposed is \$1,000.
- 

**Condition of approval** - The stormwater management plan must be fully implemented prior to a request for final inspection of the building or zoning permit.

**Acknowledgement** – By executing below, the Owner acknowledges the following:

- I declare I am the owner of the property.
- The information provided is accurate.
- I further acknowledge that municipal representatives are granted access to the above described property for review and inspection as may be required.

**Owner** \_\_\_\_\_

**Date** \_\_\_\_\_