SOUTH WHITEHALL TOWNSHIP

Wednesday, August 17, 2022
Board of Commissioners

Public Meeting Room, 7:00 p.m.
South Whitehall Township Building
4444 Walbert Avenue
Allentown, PA 18104

1. CALL TO ORDER

2. PLEDGE OF ALLEGIANCE

3. ANNOUNCEMENTS

A. All public sessions of the South Whitehall Township Board of Commissioners are electronically recorded, filed, and posted to the website for Public access.

B. Public/Virtual Meeting Rules

C. Board of Commissioners Met in Executive Session on the following date(s) to discuss Legal and/or Personnel Matters: Prior to this evening's August 17, 2022 Meeting

4. COURTESY OF THE FLOOR - Public Comment on Non-Agenda Items

5. MINUTES

A. August 3, 2022 - Board of Commissioners Meeting Minutes

6. PRESENTATIONS

7. ORDINANCES

A. For Discussion Only/Permission to Advertise - An Ordinance Reenacting, Amending and Restating Chapter 296 (Stormwater Management) of the Codified Ordinances of South Whitehall Township in its Entirety, Providing the Article shall be Known as the south Whitehall Township Stormwater Management Plan Ordinance and Further Providing for General Provisions; Definitions; Stormwater Management Standards; Drainage Plan Requirements; Inspections; Storm Water Management (SWM) Site Plan Requirements; Stormwater BMP Operations and Maintenance Plan General Requirements; Operations and Maintenance; Maintenance Responsibilities for Permanent Stormwater Runoff Controls; Fees and Expenses; Prohibitions; Enforcement and Penalties; References; Repealer; Severability; Failure to Enforce not a Waiver; Repealer; Effective Date

8. RESOLUTIONS

A. A Resolution to Adopt the "Sidewalk Deferral Call-In Policy" for South Whitehall Township

9. MOTIONS

A. Motion to Proceed with Finalizing the PennDOT Land Acquisition - 4298 Windsor Drive

B. Motion Requesting Permission to Advertise for Sanitary Sewer Relocation Project

C. Motion Requesting Permission to Execute One-Year Contract for Nixle-360 Program

D. Motion to Approve Recommendation for Jordan Creek Greenway Trail, Shared Road Section

E. Motion Requesting Permission to Award Bid for Wehr's Dam Project

F. Motion to Approve Budget Transfers within the 2022 Fire Budget

10. CORRESPONDENCE AND INFORMATION ITEMS

A. Boards and Commissions - Informational Items/Vacancies

11. OLD BUSINESS

A. Wehr's Dam

B. Comprehensive Plan Update - Explanation by Dave Manhardt, Director, Community Development Department

12. DIRECTION/DISCUSSION ITEMS

13. COURTESY OF THE FLOOR - Public Comment on Non-Agenda Items

14. MOTION TO AUTHORIZE PAYMENT OF INVOICES & DISBURSEMENTS

A. Invoices and Disbursements

15. EXECUTIVE SESSION

16. ADJOURNMENT

SOUTH WHITEHALL TOWNSHIP

BOARD OF COMMISSIONERS

PUBLIC MEETING **AGENDA-MINUTES** **August 3, 2022**

1. CALL TO ORDER: 7:00 p.m.

Attendees:

Commissioner Diane Kelly, President
Commissioner David M. Kennedy, Vice President **
Commissioner Monica Hodges, Assist. Twp. Secretary
Commissioner Michael Wolk **
Commissioner Brad Osborne
Joseph Zator, Solicitor, Zator Law
Anthony Tallarida, Twp. Engineer, The Pidcock Co.

Herb Bender, Interim Township Manager
Mike Elias, PW Utility & MS4 Coordinator
Mike Kukitz, Parks & Rec Manager
Scott Boehret, Director of Finance
Tricia Dickert, Assist. Director of Finance
Glen Dorney, Chief of Police
Dave Manhardt, Director, Community Development Dept.*
Chris Strohler, Long-Range Planner, CD Dept.
Gregg Adams, Planner, Community Development Dept.
Chris Kiskeravage, Twp. Fire Commissioner
John Frantz, Fire Marshal, Building Code Official
Tom Harper, Code Enforcement Program Manager
Rob Fehnel, IT Projects Manager
Tracy Fehnel, Exec. Assistant

Absent* **Attended Virtually ****

2. PLEDGE OF ALLEGIANCE

3. ANNOUNCEMENTS:

a. All Public sessions of the South Whitehall Township Board of Commissioners are electronically recorded, filed, and posted to the website for Public access.

b. Public/Virtual Meeting Rules

c. Board of Commissioners Met in Executive Session on the following date(s) to discuss Legal and/or Personnel Matters: Prior to this evening's August 3rd Meeting.

4. COURTESY OF THE FLOOR: Public Comment on Non-Agenda Items – None.

5. MINUTES:

a. July 20, 2022 – Board of Commissioners Minutes

A MOTION was made by Commissioner Hodges, which was seconded by Commissioner Kelly, to approve the July 20, 2022, BOC Minutes as presented (with one minor tweak). All in favor; none opposed. Vote was 5:0. Motion Carried.

6. PRESENTATIONS: None.

7. ORDINANCES: None.

8. RESOLUTIONS:

a. A Resolution of the Board of Commissioners of South Whitehall Township, Lehigh County, Pennsylvania, Appointing Thomas Petrucci as Township Manager

President Kelly explained that the Board conducted an extensive recruitment process for Township Manager, with the assistance of Lafayette College/Meyner Center, with numerous candidates being interviewed over several months. This Resolution before the board is a resolution to appoint Thomas Petrucci as Township Manager for SWT.

Mr. Petrucci holds a B.A. in Journalism from Temple University and a Master of Public Administration from Villanova, with an emphasis in Financial Management and Leadership Ethics. He served as the Township Manager for the Borough of Bath from 2012-2015. In his most recent position, Tom served as Plainfield Township Manager for the past seven years.

A MOTION was made by President Kelly, which was seconded by Commissioner Hodges, to approve resolution appointing Thomas Petrucci as Township Manager for SWT. All in favor; none opposed. Vote 5:0. Motion carried.

Township Manager Tom Petrucci's first day with SWT will be on Tuesday, September 6, 2022.

b. A Resolution Extending the Conditional Preliminary/Final Approval Granted to a Major Plan Entitled "Parkland Manor Phase 4 Senior Living"

Chris Strohler, Long-Range Planner, CD Dept., explained that an Application was submitted, to further develop the property at 4636 Crackersport Road, aka Parkland Manor. The Applicant is PA Venture Capital, Inc. BOC granted final approval to Phase 4 June 2020 with 2 waivers and 17 conditions of approval. Currently 10 of the 17 conditions have been satisfied. Out of remaining conditions, 2 of them are legal protections—1 is the requirements to record the plan, and therefore there are 4 conditions we are still working on with the developer. Applicant is requesting a retro-active 90-day extension on the P-F Approval to satisfy the remaining conditions. Resolution before Board this evening will amend original resolution granting Applicant the 90-day extension allowing them until September 28, 2022, to satisfy the remaining conditions. CD Dept. is working with Developer on these conditions and has no issues with this request before the Board this evening.

Attorney Joel Wiener and Bill Erdman, Keystone Consulting Engineers, were both in attendance this evening, on behalf of Applicant. Attorney Wiener explained the delay was due primarily to COVID, vacations, and a variety of other things in order to get the releases. All the items needed have been identified, and are at the final stages—the Township has the letter of credit in place, the plans have been confirmed by the engineers, and the general form of the easements that the Township is looking for have all been delivered.

A MOTION was made by Commissioner Osborne, which was seconded by Commissioner Kelly, to approve above resolution. All in favor; none opposed. Vote 5:0. Motion carried.

c. A Resolution Appointing Vincent Quinn as a Regular Member of the South Whitehall Township Civil Service Commission

Chief Glen Dorney explained they are requesting that Mr. Quinn be appointed as a regular member of the CSC—currently he is an alternate member. Mr. Quinn has done an excellent job the last two years as he served as alternate member of the CSC. A vacancy was created by Mr. Mike Bruckner, who was a regular member, and moved out of state.

A MOTION was made by Commissioner Wolk, which was seconded by Commissioner Osborne, appointing Mr. Quinn as a regular member to the CSC. All in favor; none opposed. Vote 5:0. Motion carried.

d. A Resolution Approving and Adopting the First Amendment to Contract for "Residential Municipal Solid Waste (MSW) Collection, Disposal and Recycling Services" to Provide for an Extension of One Year Through 2023

Interim Township Manager Herb Bender explained that SWT is requesting permission to extend the Residential Municipal Solid Waste (MSW) Collection, Disposal, and Recycling Services Contract. When the Township went out to bid in 2019, we gave bidders an option to bid a three and five-year contract. The Township chose to award a three-year contract with an option to extend the contract at the last contractual year price. Waste Management has agreed to hold their prices for another one-year term, which we feel with the economy and an unstable fuel market, would be in the best interest of the Township to extend this contract.

A MOTION was made by Commissioner Kelly, which was seconded by Commissioner Wolk, approving above resolution as explained by Mr. Bender. All in favor; none opposed. Vote 5:0. Motion carried.

9. MOTIONS: None.

10. CORRESPONDENCE AND INFORMATION ITEMS:

a. Boards and Commissions – Informational Items/Vacancies

CURRENT VACANCIES ON BOARDS/COMMISSIONS:

1. Civil Service Commission - 2 Alternate Vacancies
2. Green Advisory Council - 3 Vacancy
3. Landscape Shade Tree Commission - 2 Vacancies
4. Park & Recreation Board - 1 Vacancy
5. Environmental Advisory Council - 3 Vacancies

UPCOMING MEETINGS: Details posted on website.

- Tuesday, August 9th - Comprehensive Plan Workshop, 7P
- Wednesday, August 10th - Civil Service Commission, 1P
- Wednesday, August 10th - Building Code Appeals Board, 3:30P
- Wednesday, August 10th - BOC Workshop, 6P
- Friday, August 12th - Movie in the Park, Fernwood Park, 7:45P
- Monday, August 15th - Green Advisory Council, 6P

Applications continue to be accepted.

11. OLD BUSINESS

a. Wehr's Dam - Status

Interim Township Manager, Herb Bender explained, as mentioned, bids were rejected. Went back out and advertised July 15th & 29th. Prebid meeting held today 10A. Questions to be submitted by 4P today to PennBid. Bid opening on August 8th. Will be brought back to the BOC, hopefully to award, next time. We feel we will get competitive bids this time.

b. Comprehensive Plan Update - Explanation by Chris Strohler, Long-Range Planner, Community Development Department

Team has been working to synthesize the goals, strategies, and implementation for all the elements of the plan. Worked through resource protection, community utilities, housing, community facilities, and finalizing the transportation components at next workshop. Starting to dig into the land-use plan—have developed a final outline of the plan, and starting to put together a final draft. Will be conducting some public outreach this September in coordination with Parkland School District to get feedback on the final elements and to get the community excited about the plan. Draft plan to come in October, which will be the opening of the 45-day comment period. Looking at a proposed adoption in December 2022. All work up to this point has been posted to website.

Commissioner Wolk would like to have a written schedule/bar chart that shows the mid/high-level milestones, which would occur prior to our getting to the December end date, so that we know where we are in the process.

c. Creek Greenway, Phase 1 - River Road (Shared Pathway) - Explanation by Mike Kukitz, Parks & Recreation Manager

Mike Kukitz, Park & Recreation Manager, explained we are getting closer. SWT did receive the TASA funding to complete the construction of the trail through the park. We have approximately one year to get everything lined up before we go out to bid in order to stay on schedule. Options have been narrowed down from five to two potential options, with Michael Baker looking at a third option outside scope of original five. Staff's plan is to review those options and come to you with a recommendation at the next BOC meeting with something fiscally responsible and very safe for our residents, in order to stay on schedule and get the trail built by end of 2023/beginning 2024.

12. <u>DIRECTION/DISCUSSION ITEMS</u>:

a. Nixel 360 Platform

Interim Township Manager Herb Bender explained he and Jeff Kelly, Emergency Management Director for SWT, as well as Chief Glen Dorney have been working on the Nixel 360 Platform, and feel this would be very helpful to the Township to move forward with Nixel 360. Currently under contract with our other Reverse 911-Call System, which we cannot get out of until end of year—we do not have to renew EOY. Mr. Bender explained he'd like to run these side-by-side for the remainder of the year. Moving forward, we would like to move away from the Reverse 911-Call and continue forward with the Nixel 360. This would be a one-year contract with Nixel, with the option of two more additional, one-year contracts with them, which means we are not locking ourselves into a three-year contract. This works

well with the use of social media for PD, which can be run through Nixel 360. This can also be used to get messages out with regard to water-main breaks, paving, etc.—messages would go out only to those in that particular area. We get 1M messages a year under this contract. Cost of this contract would be $4,050.00 for the Nixel 360. Set up fee is $324 first year; 2nd & 3rd years would be $4,050.00/year. Will get a copy of the contract for the next meeting. Jeff Kelly explained this will also be introduced at the Community Preparedness Day event September 10th where residents will be able to sign up for it there, via their smart phones, which is already being done by a lot of communities. Also, Sergeant Grozier will no longer have to post to all the different media platforms, because Nixel will do that for him. This will come back to the Board at the August 17th meeting.

National Night Out Event - At this point in the meeting, President Kelly thanked the entire PD, along with Chief Dorney, and all who helped to make the National Night Out event a success—it was a great community event enjoyed by the residents. Chief also thanked Sergeant Grozier for the many hours invested into developing and making this event a big success.

13. COURTESY OF THE FLOOR: Public Comment on Non-Agenda Items – None.

14. MOTION TO AUTHORIZE PAYMENT OF INVOICES & DISBURSEMENTS:

a. Invoices and Disbursements

A MOTION was made by Commissioner Osborne, which was seconded by Commissioner Hodges, to approve the payment of all invoices. All in favor; none opposed. Motion carried. Vote 5:0.

15. EXECUTIVE SESSION: None.

16. ADJOURNMENT: At 7:38 p.m. a MOTION was made by Commissioner Hodges, which was seconded by Commissioner Kelly, to adjourn. All in favor; none opposed.

Light reception was held after meeting to welcome new Township Manager Tom Petrucci.

SOUTH WHITEHALL TOWNSHIP

MEMORANDUM FOR AGENDA ITEMS

TO:	Board of Commissioners
FROM:	Herb Bender
DATE:	August 12, 2022
SUBJECT:	Compliance Update to Storm Water Ordinance
COPY TO:	M. Elias

- **Background Information and/or Justification of Expense:**

  South Whitehall Township is required to adopt the 2022 DEP Model Storm Water Ordinance by September 30, 2022, in order to stay in compliance with our MS4 Permit. We consulted with our Township engineer, as well as Attorney Zator's office; everyone was in agreement with the changes.

- **Action Requested:**

  We are asking to move forward with advertising this update.

- **Budget Line Item (if applicable):**

TOWNSHIP OF SOUTH WHITEHALL
LEHIGH COUNTY, PENNSYLVANIA

ORDINANCE NO. _____
(Duly adopted _____, 2022)

AN ORDINANCE REENACTING, AMENDING AND RESTATING CHAPTER 296 (STORMWATER MANAGEMENT) OF THE CODIFIED ORDINANCES OF SOUTH WHITEHALL TOWNSHIP IN ITS ENTIRETY, PROVIDING THE ARTICLE SHALL BE KNOWN AS THE SOUTH WHITEHALL TOWNSHIP STORMWATER MANAGEMENT PLAN ORDINANCE AND FURTHER PROVIDING FOR GENERAL PROVISIONS; DEFINITIONS; STORMWATER MANAGEMENT STANDARDS; DRAINAGE PLAN REQUIREMENTS; INSPECTIONS; STORMWATER MANAGEMENT (SWM) SITE PLAN REQUIREMENTS; STORMWATER BMP OPERATIONS AND MAINTENANCE PLAN GENERAL REQUIREMENTS; OPERATIONS AND MAINTENANCE; MAINTENANCE RESPONSIBILITIES FOR PERMANENT STORMWATER RUNOFF CONTROLS; FEES AND EXPENSES; PROHIBITIONS; ENFORCEMENT AND PENALTIES; REFERENCES; REPEALER; SEVERABILITY; FAILURE TO ENFORCE NOT A WAIVER; REPEALER; EFFECTIVE DATE

WHEREAS, South Whitehall Township ("Township") is a political subdivision, municipal corporation, and First-Class Township of the Commonwealth of Pennsylvania, being a body corporate and politic, situated in Lehigh County, duly established and lawfully existing under and pursuant to the First-Class Township Code of the Commonwealth of Pennsylvania, 53 P.S. §§ 55101 et seq., as amended;

WHEREAS, the Pennsylvania Storm Water Management Act (Act 167), adopted by the General Assembly on October 4, 1978, as amended by Act 63 of May 24, 1984, imposed upon the County of Lehigh (the "County") a responsibility for promulgating watershed management plans for the Little Lehigh Creek, Coplay Creek, and Jordan Creek and the County's other watersheds; and,

WHEREAS, the Board of Commissioners of South Whitehall Township (the "Board") adopted Ordinance No. 724 on January 3, 2001, that implemented and adopted updates to the Little Lehigh Creek Watershed Stormwater Management Plan and coordinated those updates with the Jordan Creek and Coplay Creek Watershed Plans; and,

WHEREAS, the Board adopted Ordinance No. 855 on April 18, 2007, to incorporate the Pennsylvania Department of Environmental Protection water quality updates to the Little Lehigh Creek Watershed and the federal requirements under the National Pollutant Discharge Elimination System ("NPDES") program for communities covered by the Phase II permit process; and

WHEREAS, South Whitehall Township is required to adopt the Pennsylvania Department of

Environmental Protection water quality updates as part of the Lehigh County Act 167 Global Update Watershed Stormwater Management Plan; and,

WHEREAS, South Whitehall Township is required to adopt the requirements under the NPDES program for communities covered by the Phase II permit process.

NOW, THEREFORE, in order to comply with the state and federal requirements for water quality and the NPDES program, and to incorporate updates to the Lehigh County Act 167 Stormwater Management Plan, the Board does hereby ORDAIN the following changes to Chapter 296 of the Codified Ordinances:

SECTION 1. RESTATEMENT OF CHAPTER 296 (STORMWATER MANAGEMENT)

Chapter 296 "Stormwater Management" shall be restated in its entirety as follows:

ARTICLE I
GENERAL PROVISIONS

§ 296-1 Title

This chapter shall be known and may be cited as the "South Whitehall Township Stormwater Management Plan for portions of the Little Lehigh Creek Watershed, Coplay Creek Watershed and Jordan Creek Watershed located within South Whitehall Township."

§ 296-2 Statement of findings

The South Whitehall Township Commissioners find that:

A. Inadequate management of accelerated runoff of stormwater resulting from development throughout the watersheds of the Township increases runoff volumes, flood flows and velocities, contributes to erosion and sedimentation, changes the natural hydrologic patterns, destroys aquatic habitat, elevates aquatic pollutant concentrations and loadings, overtaxes the carrying capacity of streams and storm sewers, greatly increases the cost of public facilities to carry and control stormwater, undermines floodplain management and flood control efforts in downstream communities, reduces groundwater recharge and threatens public health and safety, and increases nonpoint source pollution of water resources.

B. A comprehensive program of stormwater management (SWM), including reasonable regulation of development and activities causing accelerated runoff and erosion and loss of natural infiltration, is fundamental to the public health, safety and welfare and the protection of the people of the Township and all the people of the Commonwealth, their resources, and the environment.

C. Stormwater is an important resource that provides groundwater recharge for water supplies

and supports the baseflow of streams, which also protects and maintains surface water quality.

D. The use of green infrastructure and low impact development (LID) are intended to address the root cause of water quality impairment by using systems and practices which use or mimic natural processes to:

1) infiltrate and recharge,
2) evapotranspire, and/or
3) harvest and use precipitation near where it falls to Earth.

Green infrastructure practices and LID contribute to the restoration or maintenance of pre-development hydrology.

E. 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) program.

F. Non stormwater discharges to Township separate storm water systems can contribute to pollution of waters of the Commonwealth by the Township.

G. Public education on the control of pollution from stormwater is an essential component in successfully addressing stormwater.

§ 296-3 Purpose.

The purpose of this chapter is to promote public health, safety and welfare within the Township and the Little Lehigh Creek, Coplay Creek and Jordan Creek Watersheds by minimizing the harms and maximizing the benefits described in § **296-2A** above, through provisions designed to:

A. Meet legal water quality requirements under state law, including regulations of 25 Pa. Code Chapter 93 to protect and maintain "existing uses" and the level of water quality to support those uses in all streams, to protect and maintain water quality in "special protection" streams, to reclaim, and restore the existing and designated uses of the waters of this Commonwealth.

B. Manage stormwater runoff impacts at their source by regulating activities which cause such problems.

C. Utilize and preserve the desirable existing natural drainage systems.

D. Encourage infiltration of stormwater, where appropriate, to maintain groundwater recharge,

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

E. Maintain the existing flows and quality of streams and water courses in the Township and the Commonwealth.

F. Preserve and restore the flood carrying capacity of streams.

G. Provide for proper maintenance of all permanent stormwater management BMPs that are implemented in the Township.

H. Provide review procedures and performance standards for stormwater planning, design, and management.

I. Manage stormwater impacts close to the runoff source which requires a minimum of structures and relies on natural processes.

J. Prevent scour and erosion of streambanks and streambeds.

K. Provide standards to meet the NPDES permit requirements.

L. Manage stormwater runoff close to the source, reduce runoff volumes and mimic predevelopment hydrology.

§ 296-4 Statutory authority

The Township of South Whitehall is empowered to regulate land use activities that affect runoff by the authority of the Act of July 31, 1068, P.L. 805, No. 247, the Pennsylvania Municipalities Planning Code as amended, and/or the Act of October 4, 1978, P.L. 864 (Act 167), 32 P.S. § 680.1 et seq., as amended, the Stormwater Management Act, the First Class Township Code, and the Township of South Whitehall, Chapter **312**, Subdivision and Land Development, and Chapter **350**, Zoning.

§ 296-5 Applicability

All regulated activities that may affect stormwater runoff, including land development and earth disturbance activity, are subject to regulation by this Chapter. Regulated activities include:

A. Although generally applicable to all drainage areas in the Township, the provisions of this Chapter, which make specific reference to the Little Lehigh Creek, Coplay Creek and Jordan Creek Watersheds or to the release rate maps contained in the plan, shall only apply to those areas of the Township which are located within the Little Lehigh Creek, Coplay

Creek and Jordan Creek drainage basins as delineated on an official map available for inspection at the Township office. Maps of the Little Lehigh Creek, Coplay Creek and Jordan Creek Watersheds at a reduced scale are included in Appendix A of this Chapter for general reference.

B. This chapter shall only apply to permanent stormwater management facilities constructed as part of any of the activities listed in this section. Stormwater management and erosion and sedimentation control during construction involved with any of these activities are specifically not regulated by this Chapter but shall continue to be regulated under existing laws and ordinances.

C. This chapter contains only those stormwater runoff control criteria and standards which are necessary or desirable from a total watershed perspective. Additional stormwater management design criteria (i.e., inlet spacing, inlet type, collection system details, etc.), which represent sound engineering practice, may be regulated either by separate stormwater ordinance provisions or as part of the general responsibilities of the Township Engineer.

D. The following activities are defined as regulated activities and shall be regulated by this Chapter, except those which meet the waiver specifications presented thereafter:

1. Land development.

2. Subdivision.

3. Construction of new or additional impervious surfaces (driveways, parking lots, etc.).

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

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

6. Installation of stormwater systems or appurtenances thereto.

7. Regulated earth disturbance activities.

8. Other than what is included in **§296-5 D (1)** through **D(7)**, any earth disturbance activities or any activities that include the alteration or development of land in a manner that may affect stormwater runoff onto adjacent property.

E. Any proposed regulated activity, except those defined in Subsection **D (5)** and **(6)**, above, which would create 10,000 square feet or less of additional impervious cover would be exempt from meeting the provisions of this Chapter. Development plans qualifying for this

waiver would still be required to manage the quantity, velocity and direction of resulting storm runoff as is reasonably necessary to prevent injury to health, safety or other property.

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

G. Additional impervious cover shall include, but not be limited to, any roof, parking or driveway areas and any new streets and sidewalks constructed as part of or for the proposed regulated activity. Any areas which may be designed to initially be semipervious (e.g., gravel, crushed stone, porous pavement, etc.) shall be considered impervious areas for the purpose of the waiver provisions of § **296-20**, hereof.

H. The hardship waiver provisions found in § **296-25** shall not be available for regulated activities as defined in Subsection **D (5)** and **(6)**, above.

§ 296-6 Compatibility with Other Requirements.

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

§ 296-7 Erroneous Permit

Any permit or authorization issued or approved based on false, misleading, or erroneous information provided by an applicant is void without the necessity of any proceedings for revocation. Any work undertaken or use established pursuant to such permit or other authorization is unlawful. No action may be taken by a board, agency or employee of the Township purporting to validate such a violation.

§296-8 Waivers

A. If the Township determines that any requirement under this Chapter cannot be achieved for a particular regulated activity, the Township may, after an evaluation of alternatives, approve measures other than those in this Chapter, subject to **§296-8**, paragraphs B and C.

B. Waivers or modifications of the requirements of this Chapter may be approved by the Township if enforcement will exact undue hardship because of peculiar conditions pertaining to the land in question, provided that the modifications will not be contrary to the public interest and that the purpose of the Chapter is preserved. Cost or financial burden shall not be considered a hardship. Modification may be considered if an alternative standard or approach will provide equal or better achievement of the purpose of the Chapter. A request for modifications shall be in writing and accompany the Stormwater Management Site Plan submission. The request shall provide the facts on which the request is based, the provision(s) of the Chapter involved and the proposed modification.

C. No waiver or modification of any regulated stormwater activity involving earth disturbance greater than or equal to one acre may be granted by the Township unless that action is approved in advance by the Department of Environmental Protection (DEP) or the delegated county conservation district.

§ 296-9 Duty of persons engaged in the development of land

Notwithstanding any provisions of this Chapter, including waiver provisions, 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 or other property. Such measures shall include such actions as are required to manage the rate, volume and direction of resulting stormwater runoff in a manner which otherwise adequately protects health and property from possible injury.

Article II
Definitions

§ 296-10 Definitions of terms and phrases

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

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

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

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

D. Any word, term or phase used in this Chapter, but not specially defined herein, shall be given its normal and customary meaning.

These definitions do not necessarily reflect the definitions contained in pertinent regulations or statutes and are intended for this Chapter only.

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

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.

Agricultural Plowing or Tilling Activity – (1) Earth disturbance activity involving the preparation and maintenance of soil for the production of agricultural crops. (2) The term includes no-till cropping methods, the practice of planting crops with minimal mechanical tillage.

Applicant – A landowner, developer, person, partnership, association, corporation or other entity or other responsible person therein or agent thereof, who has filed an application to the Township for approval to engage in any regulated activity at a project site in the Township.

Best Management Practice (BMP) – Activities, facilities, designs, measures, or procedures used to manage stormwater quantity and quality impacts from regulated activities listed in **§296-5** to meet State Water Quality requirements, to promote groundwater recharge, and to otherwise meet the purposes of this Chapter. Stormwater BMPs are commonly grouped into one of two broad categories or measures: "structural" or "non-structural." In this Chapter, non-structural BMPs or measures refer to operational and/or behavior-related practices that attempt to minimize the contact of pollutants with stormwater runoff, whereas structural BMPs or measures are those that consist of a physical device or practice that is installed to capture and treat stormwater runoff. Structural BMPs include, but are not limited to, a wide variety of practices and devices, from large-scale retention ponds and constructed wetlands to small-scale underground treatment systems, infiltration facilities, filter strips, low impact design, bioretention, wet ponds, permeable paving, grassed swales, riparian or forested buffers, sand filters, detention basins, and manufactured devices. Structural stormwater BMPs are permanent appurtenances to the project site.

Best Management Practice Operations and Maintenance Plan - Documentation, included as part of a drainage plan, detailing the proposed BMPs, how they will be operated and maintained and who will be responsible.

Bioretention - Densely vegetated, depressed features that store stormwater and filter it through vegetation, mulch, planting soil, etc. Ultimately stormwater is evapotranspirated, infiltrated or discharged. Optimal bioretention areas mimic natural forest ecosystems in terms of species diversity, density, distribution, use of native plants, etc.

Buffer

(1) Streamside buffer. A zone of variable width located along a stream that is vegetated and is designed to filer pollutants from runoff.

(2) Special geologic feature buffer. A required isolation distance from a special geologic feature to a proposed BMP needed to reduce the risk of sinkhole formation due to stormwater management activities.

Capture/Reuse - Stormwater management techniques, such as cisterns and rain barrels which direct runoff into storage devices, surface or subsurface for later reuse, such as irrigation of

gardens and other planted areas.

Carbonate Bedrock - Rock consisting chiefly of carbonate minerals, such as limestone and dolomite; specifically, a sedimentary rock composed of more than 50% by weight of carbonate minerals that underlies soil or other unconsolidated superficial material.

Cistern - An underground reservoir or tank for storing rainwater.

Closed Depression - In a karst area, a distinctive bowl-shaped depression in the land surface. It is characterized by internal drainage, varying magnitude, and an unbroken ground surface.

Concentrated Drainage Discharge – Stormwater runoff leaving a property via a point source.

Conservation District - The Lehigh County Conservation District, as applicable.

Constructed Wetlands - Constructed wetlands are similar to wet ponds (see below) and consist of a basin which provides for necessary stormwater storage as well as a permanent pool or water level, planted with wetland vegetation. To be successful, constructed wetlands must have adequate natural hydrology (both runoff inputs as well as soils and water table which allow for maintenance of a permanent pool of water). In these cases, the permanent pool must be designed carefully, usually with shallow edge benches, so that water levels are appropriate to support carefully selected wetland vegetation.

Culvert - A pipe, conduit or similar structure including appurtenant works which carries surface water.

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

DEP - The Pennsylvania Department of Environmental Protection

Design Storm - The depth and time distribution of precipitation from a storm event measured in probability of occurrence (e.g., 100-year storm) and duration (e.g., 24 hours), used in the design and evaluation of stormwater management control systems.

Detention Basin - A basin designed to retard stormwater runoff by temporarily storing the runoff and releasing it at a predetermined rate.

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

Developer - See"Applicant"

Development Site - See "Project Site"

Diffused Drainage - See "Sheet Flow."

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

Direct Recharge/Subsurface BMP – A BMP designed to direct runoff to groundwater recharge without providing for vegetative uptake. Examples include infiltration trenches, seepage beds, drywells, and stormwater drainage wells such that nearly all runoff becomes recharge to groundwater.

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

Drainage Plan - The documentation of the proposed stormwater quantity and quality management controls, if any, to be used for a given development site, including a BMP operations and maintenance plan, the contents of which are established in § **296-21**.

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

Erosion - The natural process by which the surface of the land is worn away by water, wind, ice, chemical action or other geological agents.

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

Existing Uses - Those uses actual attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards. (25 Pa. Code Chapter 93.1)

FEMA – Federal Emergency Management Agency

Fill - Man-made deposits of natural soils or rock products and waste materials.

Filter Strips - See "Vegetated Buffers."

Freeboard - The incremental depth in a stormwater management structure, provided as a safety factor of design, above that required to convey the design runoff event.

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

Floodway – The channel of the watercourse and those portions of the adjoining floodplains that are reasonably required to carry and discharge the 100-year flood. Unless otherwise

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

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

Green Infrastructure – Systems and practices that use or mimic natural processes to infiltrate, evapotranspire, or reuse stormwater on the site where it is generated.

Groundwater Recharge - Replenishment of existing natural underground water supplies.

Hardship Waiver Request - A written request for a waiver alleging that the provisions of this Chapter inflict unnecessary hardship upon the applicant. Hardship waiver does not apply to and is not available from the water quality provisions of this Chapter shall not be granted.

Hot Spot Land Uses - A land use or activity that generates higher concentrations of hydrocarbons, trace metals or other toxic substances than typically found in stormwater runoff. These land uses are listed in § **296-15P.**

Hydrologic Soil Group (HSG) - Infiltration rates of soils vary widely and are affected by subsurface permeability as well as surface intake rates. Soils are classified into four HSGs (A, B, C and D) to indicate the minimum infiltration rates, which are obtained for bare soil after prolonged wetting. The Natural Resources Conservation Service (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 previous as the HSG varies from A to D (NRCS[1,2]).

Impervious Surface (Impervious Cover) - A surface which prevents the percolation of water into the ground. Impervious surfaces (or areas) shall include, but not be limited to: roofs; additional indoor living spaces, swimming pools, patios, garages, storage sheds and similar structures; and any new streets or sidewalks. Decks, parking areas, and driveway areas are not counted as impervious areas if they do not prevent infiltration.

Infiltration Practice - A practice designed to allow direct runoff an opportunity to infiltrate into the ground, (e.g., French drain, seepage pit, seepage trench or bioretention area).

Infiltration Structure - A structure designed to direct runoff into the ground, (e.g., French drain, seepage pit or seepage trench).

Karst - A type of topography or landscape characterized by surface depressions, sinkholes, rock pinnacles/uneven bedrock surface, underground drainage and caves. Karst is usually formed on

carbonate rocks, such as limestones or dolomites.

Land Development – Inclusive of any or all of the following meanings:

1. The improvement of one lot or two or more contiguous lots, tracts or parcels of land for any purpose involving:

    a. A group of two or more 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,

    b. The division or allocation of land or space, between or among two or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups or other features.

    c. A subdivision of land.

    d. Development in accordance with Section 503 (1.1) of the Pennsylvania Municipalities Planning Code.

Loading Rate - The ratio of the land area draining to the system, as modified by the weighting factors in § **296-18B** compared to the base area of the infiltration system.

Local Runoff Conveyance Facilities - Any natural channel or man-made conveyance system which has the purpose of transporting runoff from the site to the mainstem.

Low Impact Development (LID) - Site design approaches and small-scale stormwater management practices that promote the use of natural systems for infiltration, evapotranspiration, and reuse of rainwater. LID can be applied to new development, urban retrofits, and revitalization projects. LID utilizes design techniques that infiltrate, filter, evaporate, and store runoff close to its source. Rather than rely on costly large-scale conveyance and treatment systems, LID addresses stormwater through a variety of small, cost-effective landscape features located on-site.

Mainstem (Main Channel) - Any stream segment or other conveyance used as a reach in the Little Lehigh Creek and Jordan Creek hydrologic models. In the Coplay Creek watershed, any stream segment or other conveyance in a dual release rate or conditional no detention I subarea used as a reach in the hydrologic model. In conditional no detention II subareas the main channel is the Lehigh River.

Manning Equation (Manning Formula) - A method for calculation of velocity of flow (e.g., feet per second) and flow rate (e.g., cubic feet per second) in open channels based upon channel shape, roughness, depth of flow and slope. "Open channels" may include closed conduits so long

as the flow is not under pressure.

Maryland Stormwater Design Manual - A stormwater design manual written by the Maryland Department of the Environment and the Center for Watershed Protection. The manual can be obtained through the following web site: www.mde.state.md.us.

Minimum Disturbance/Minimum Maintenance Practices (MD/MM) - A site design practice in which careful limits are placed on site clearance prior to development allowing for maximum retention of existing vegetation (woodlands and other), minimum disturbance and compaction of existing soil mantle and minimum site application of chemicals post-development. Typically, MD/MM includes disturbance setback criteria from buildings as well as related site improvements such as walkways, driveways, roadways and any other improvements. These criteria may vary by community context as well as by type of development being proposed. Additionally, MD/MM also shall include provisions (e.g., deed restrictions, conservation easements) to protect these areas from future disturbance and from application of fertilizers, pesticides and herbicides.

No Harm Runoff Quantity Option - The option of using a less restrictive runoff quantity control if it can be shown that adequate and safe runoff conveyance exists and that the less restrictive control would not adversely affect health, safety and property.

NPDES Regulations - National Pollutant Discharge Elimination System regulations.

NRCS - USDA Natural Resource Conservation Service (formerly the Soil Conservation Service).

Oil/Water Separator - A structural mechanism designed to remove free oil and grease (and possibly solids) from stormwater runoff.

Outfall - "Point source" as described in 40 CFR § 122.2 at the point where the Township's storm sewer system discharges to waters of the Commonwealth.

Owner - One with an interest in and often dominion over a property.

Peak Discharge - The maximum rate of flow of stormwater runoff at a given location and time resulting from a specific storm event.

Penn State Runoff Model (PSRM) - The computer-based hydrologic modeling technique adapted to each watershed for the Act 167 Plans. The model was calibrated to reflect actual flow values by adjusting key model input parameters.

Person - An individual, partnership, public or private association or corporation, or a governmental unit, public utility or other for or not for profit statutory entity or other legal entity whatsoever which is recognized by law as the subject of rights and duties.

Pervious Area – Any area not defined as impervious.

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.

Preliminary Site Investigation - The determination of the depth to bedrock, the depth to the seasonal high-water table and the soil permeability for a possible infiltration location on a site through the use of published data and on-site surveys. In carbonate bedrock areas, the location of special geologic features must also be determined along with the associated buffer distance to the possible infiltration area.

Pre-Treatment – Measures implemented for Hot Spot Land Uses designed to reduce concentration of hydrocarbons, trace metals, and other toxic substances to levels typically found in stormwater runoff.

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

Public Water Supplier - A person who owns or operates a public water system.

Public Water System - A system which provides water to the public for human consumption which has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. (see 25 Pa. Code Chapter 109)

Qualified Geotechnical Professional -A licensed professional engineer or geologist who has a background or expertise in geology, hydrogeology or geotechnical engineering.

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

Rational Method - A method of peak runoff calculation using a standardized runoff coefficient (rational 'c'), acreage of tract and rainfall intensity determined by return period and by the time necessary for the entire tract to contribute runoff. The rational formula is stated as follows: Q = ciA, where "Q" is the calculated peak flow rate in cubic feet per second, "c" is the dimensionless runoff coefficient (see Appendix C), "i" is the rainfall intensity in inches per hour, and "A" is the area of the tract in acres. The Rational method formula for runoff volume calculation is as follows: V= cPA/12 where "c" and "A" are as noted above , "P" is the total depth of precipitation for the design event in inches, and "V" is the total runoff volume in acre-feet.

Reach - Any of the natural or man-made runoff conveyance channels used for watershed modeling purposes to connect the subareas and transport flows downstream.

Recharge Volume (REv) - The portion of the water quality volume (WQv) used to maintain groundwater recharge rates at development sites. (See § **296-15J**)

Regulated Activities - Any earth disturbance activities or any activities that involve the alteration or development of land in a manner that may affect stormwater runoff and which are governed by this chapter as specified in § **296-5D**.

Regulated Earth Disturbance Activity - Activity involving earth disturbance, other than agricultural plowing or tilling, subject to regulation under 25 Pa. Code 92, 25 Pa. Code 102, or the Clean Streams Law. Earth disturbance activity other than agricultural plowing or tilling of one acre or more with a point source discharge to surface waters or to the Township's storm sewer system or earth disturbance activity of 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.

Release Rate - The percentage of the pre-development peak rate of runoff for a development site to which the post-development peak rate of runoff must be controlled to avoid peak flow increases throughout the watershed.

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

Riparian Buffer – A permanent area of trees and shrubs located adjacent to streams, lakes, ponds and wetlands.

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 which flows over the land.

Runoff BMP – A BMP designed for essentially the full volume of runoff entering the BMP to be discharged off-site.

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

Sediment Traps/ Catch Basin Sumps - A chamber which provides storage below the outlet in a storm inlet to collect sediment, debris and associated pollutants, typically requiring periodic clean out.

Seepage Pit/Seepage Trench - An area of excavated earth filled with loose stone or similar material and into which surface water is directed for infiltration into the ground.

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.

Sheet Flow - Stormwater runoff flowing in a thin layer over the ground surface.

Soil-Cover-Complex Method - A method of runoff computation developed by NRCS which is based upon relating soil type and land use/cover to a runoff parameter called a curve number.

Special Geologic Features - Carbonate bedrock features including, but not limited to, closed depressions, existing sinkholes, fracture traces, lineaments, joints, faults, caves and pinnacles, which may exist and must be identified on a site when stormwater management BMPs are being considered.

Spill Prevention and Response Program - A program that identifies procedures for preventing and, as needed, cleaning up potential spills and makes such procedures known and the necessary equipment available to appropriate personnel.

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

1. Each stream segment in Pennsylvania has a "designated use," such as "cold water fishes" or "potable water supply," which are listed in Chapter 93. These uses must be protected and maintained, under state regulations.

2. "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.

3. 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 increased 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.

Storage Indication Method - A method of routing or moving an inflow hydrograph through a reservoir or detention structure. The method solves the mass conservation equation to determine an outflow hydrograph as it leaves the storage facility.

Storm Drainage Problem Areas - Areas which lack adequate stormwater collection and/or conveyance facilities and which present a hazard to persons or property. These areas are either documented in Appendix B of this chapter or identified by the Township or Township Engineer.

Storm Sewer - A system of pipes or other conduits which carries intercepted surface runoff,

street water and other wash waters or drainage, but excludes domestic sewage and industrial wastes.

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

Stormwater Drainage Wells – Wells for injection of stormwater to the surface that are regulated by the U.S. Environmental Protection Agency to protect underground sources of drinking water.

Stormwater Filters - Any number of structural mechanisms such as multi-chamber catch basins, sand/peat filers, sand filters and so forth, which are installed to intercept stormwater flow and remove pollutants prior to discharge. Typically, these systems require periodic maintenance and clean out.

Stormwater Management Facility – Any structure, natural or man-made, that, due to its condition, design, or construction, conveys, stores, or otherwise affects stormwater runoff. Typical stormwater management facilities include but are limited to: detention and retention basins; open channels; storm sewers; pipes; and infiltration facilities.

Stormwater management Plan - The plan for managing stormwater runoff adopted by Lehigh County for the Little Lehigh Creek, Jordan Creek, and Coplay Creek Watersheds as required by the Act of October 4, 1978, P.L. 864, (Act 167), as amended, and known as the "Stormwater 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 Chapter. **Stormwater Management Site Plan** will be designated as **SWM Site Plan** throughout this Chapter.

Stream - A watercourse.

Subarea - The smallest unit of watershed breakdown for hydrologic modeling purposes for which the runoff control criteria have been established in the Stormwater Management Plan.

Subdivision - As defined in the Pennsylvania Municipalities Planning Code, Act of July 31, 1968, P.L. 805, No. 247. The division or redivision of a lot, tract or parcel of land by any means into two or more lots, tracts, parcels or other divisions of land including changes in existing lot lines for the purpose, whether immediate or future, of lease, partition by the court for distribution to heirs or devisees, transfer or ownership or building or lot development: Provided, however, that the subdivision by lease of land for agricultural purposes into parcels of more than 10 acres, not involving any new street or easement of access or any residential dwelling, shall be exempted.

Surface Waters - Perennial and intermittent streams, rivers, lakes, reservoirs, ponds, wetlands, springs, natural seeps, and estuaries, excluding water at facilities approved for wastewater treatment such as wastewater treatment impoundments, cooling water ponds and constructed wetlands used as part of a wastewater process.

Swale - A low-lying stretch of land which gathers or carries surface water runoff. See also "vegetated swale."

Technical Best Management Practice Manual and Infiltration Feasibility Report, November 2002 - The report written by Cahill Associates that addresses the feasibility of infiltration in carbonate bedrock areas in the Little Lehigh Creek Watershed. The report is available at the Lehigh Valley Planning Commission offices.

Timber Harvesting Activities – Earth disturbance activities, including the construction of skid trails, logging roads, landing areas and other similar logging or silvicultural practices.

Township – South Whitehall Township, Lehigh County, Pennsylvania.

Trash/Debris Collectors - Racks, screens or other similar devices installed in a storm drainage system to capture coarse pollutants (trash, leaves, etc.).

USDA – United States Department of Agriculture.

Vegetated Buffers - Gently sloping areas that convey stormwater as sheet flow over a broad, densely vegetated earthen area, possibly coupled with the use of level spreading devices. A water quality BMPs, vegetated buffers serve to filter pollutants from runoff and promote infiltration. Vegetated buffers should be situated on minimally disturbed soils, have low-flow velocities and extended residence times. Vegetated buffers may be, but are not restricted to, use in riparian (streamside) conditions.

Vegetated Roofs - Vegetated systems installed on roofs that generally consist of a waterproof layer, a root-barrier, drainage layer (optional), growth media and suitable vegetation. Vegetated roofs store and eventually evapotranspirate the collected rooftop rainfall; overflows may be provided for larger storms.

Vegetated Swales -

1. Vegetated earthen channels designed to convey and possibly treat stormwater. These swales are not considered to be water quality BMPs.

2. Broad, shallow, densely vegetated, earthen channels designed to treat stormwater while slowly infiltrating, evapotranspirating, and conveying it. Swales should be gently sloping with low flow velocities to prevent erosion. Check dams may be added to enhance performance.

Vegetated/Surface BMP – A BMP designed to provide vegetative uptake and soil renovation or

surface infiltration of runoff. Capture/reuse BMPs are included if the captured runoff is applied to vegetated areas. Examples include bioretention and surface infiltration basins.

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

Water Quality Inserts - Any number of commercially available devices that are inserted into storm inlets to capture sediment, oil, grease, metals, trash, debris, etc.

Water Quality Volume (WQv) - The increase in runoff volume on a development site associated with a 2-year, 24-hour storm event. (See § **296-15B)**

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

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

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

Wet Detention Ponds - A basin that provides for necessary stormwater storage as well as a permanent pool of water. To be successful, wet ponds must have adequate natural hydrology (both runoff inputs as well as oils and water table which allow for maintenance of a permanent pool of water) and must be able to support a healthy aquatic community so as to avoid creation of mosquito and other health and nuisance problems.

Article III
Stormwater Management Standards

§296-11 General Requirements

A. For all regulated activities, unless preparation of an SWM Site Plan is specifically exempted in Section **§296-12**:

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

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

B. SWM Site Plans approved by the Township, in accordance with **§296-34**, shall be on site throughout the duration of the regulated activity.

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

D. For all regulated earth disturbance activities, erosion, and sediment control BMPs shall be designed, implemented, operated, and maintained during the regulated earth disturbance activities (e.g., during construction) to meet the purposes and requirements of this Chapter and to meet all requirements under Title 25 of the Pennsylvania Code and the Clean Streams Law. Various BMPs and their design standards are listed in the *Erosion and Sediment Pollution Control Program Manual* (E&S Manual[3]), No. 363-2134-008, as amended and updated.

E. 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 Chapter.

3. For projects that add impervious area to a parcel, the total impervious area on the parcel is subject to the requirements of this Chapter; except that the volume controls in **§296-27** and the peak rate controls of **§296-28** do not need to be retrofitted to existing impervious areas that are not being altered by the proposed regulated activity.

F. Stormwater flows onto adjacent property shall not be created, increased, or otherwise altered without written notification to the adjacent property owner(s). Such stormwater flows shall be subject to the requirements of this Chapter. Areas of existing diffused drainage discharge onto adjacent property shall be managed such that, at minimum, the peak diffused flow does not increase in the general direction of discharge, except as otherwise provided in this Chapter. If diffused flow is proposed to be concentrated and discharged onto adjacent property (including flows from detention basin emergency spillways), the developer's engineer must document and certify that there are adequate downstream conveyance facilities to safely transport the concentrated discharge to the point of predevelopment flow concentration, to the stream reach, or otherwise prove that no harm will result from the concentrated discharge. It is recommended the developer obtain written permission from the downstream property owner(s) for the proposed discharges. Areas of existing diffused drainage discharge shall be subject to any applicable release rate criteria in the general direction of existing discharge where they are proposed to be concentrated or maintained as diffused drainage areas.

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

1. Protect health, safety, and property.

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

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

   b. Maintain or extend riparian buffers.

   c. Avoid erosive flow conditions in natural flow pathways.

   d. Minimize thermal impacts to waters of this Commonwealth.

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

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

I. 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 Chapter.

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

K. The design storm volumes to be used in the analysis of peak rates of discharge should be obtained from the latest version of the Precipitation-Frequency Atlas of the United States, National Oceanic and Atmospheric Administration (NOAA), National Weather Service, Hydrometeorological Design Studies Center, Silver Spring, Maryland.

   NOAA's Atlas 14[5] can be accessed at: http://hdsc.nws.noaa.gov/hdsc/pfds/.

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

M. Various BMPs and their design standards are listed in the BMP Manual[4].

N. Storm drainage system shall be designed to preserve natural watercourses except as modified by stormwater detention facilities, recharge facilities, water quality facilities, pipe systems or open channels consistent with this Chapter.

O. Where a site is traversed by watercourses, swales, ditches, etc., there shall be provided drainage easements conforming substantially with the line of such watercourses, swales, ditches, etc. The width of any easement shall be adequate to provide for unimpeded flow of post-development storm runoff based on either calculations completed by the developer in

conformance with § **296-18** for the one-hundred-year return period runoff, the Little Lehigh Creek, Coplay Creek or Jordan Creek Act 167 one-hundred year return period flows, or Federal Emergency Management Agency (FEMA) one-hundred-year frequency flood flows and to provide a freeboard allowance of 0.5 foot above the design water surface level. In all areas, the flow rate to be utilized shall be the maximum rate identified through either developer's calculations, the Little Lehigh Creek, Coplay Creek or Jordan Creek Act 167 or (if applicable) FEMA study flows. In areas where the Act 167 flow rate is the maximum rate, this rate shall be used unless a reduced flow rate is determined by the Lehigh Valley Planning Commission to take precedence over the Act 167 flow rate. This maximum flow rate shall be used to determine the one-hundred-year water surface elevations based on HEC-RAS modeling (or other modeling method as approved by the Township). The terms of the easement shall prohibit excavation, the placing of fill or structures, and any alterations which may adversely affect the flow of stormwater within any portion of the easement in the post-development condition. Also, periodic maintenance of the easement to ensure proper runoff conveyance shall be required. Watercourses for which the one-hundred-year floodplain is formally defined by FEMA studies are subject to the applicable municipal floodplain regulations. All proposed buildings within or adjacent to a floodplain as defined by FEMA studies shall have first floor elevations at least 1.5 feet above the one-hundred-year frequency flood elevation. The one-hundred-year flood elevation to be used to establish the first-floor elevation shall be determined using the greater of the maximum flow rate referenced in FEMA study flows, Act 167 flows, or calculated flows as set forth above.

P. Any drainage facilities or structures required by this Chapter that are located on state highway rights-of-way shall be subject to approval by the Pennsylvania Department of Transportation and the Township.

Q. When it can be shown that, due to topographic conditions, natural drainage swales on the site cannot adequately provide for drainage, open channels may be constructed conforming substantially to the line and grade of such natural drainage swales. Capacities of open channels shall be calculated using the Manning Equation.

R. Storm drainage facilities and appurtenances shall be so designed and provided as to minimize erosion in watercourse channels and at all points of discharge.

S. Consideration should be given to the design and use of volume controls for stormwater management, where geology and soils permit. Areas of suitable geology for volume controls shall be determined by the Township. Documentation of the suitability of the soil for volume controls shall be provided by the applicant. Volume controls shall be acceptable in areas of suitable geology where the soils are designated as well drained in the County Soil Survey. Other soils may be acceptable for use of volume controls based on site-specific soils evaluations provided by the applicant.

T. Within areas containing soils identified by the Soils Conservation Service to be sinkhole prone, detention basins shall be lined with a material which, after installation, attains a permeability rate of less than or equal to 1×10^{-7} cm/sec.

U. Parking lot ponding depth may not exceed two inches in areas of anticipated pedestrian traffic and six inches in all areas for a twenty-five-year frequency storm.

V. Post-construction BMPs shall be designed, installed, operated, and maintained to meet the requirements of the Clean Streams Law and implementing regulations, including the established practices in 25 Pa. Code Chapter 102 and the specifications of this Chapter as to prevent accelerated erosion in watercourse channels and at all points of discharge.

W. No earth disturbance activities associated with any regulated activities shall commence until approval by the Township of a plan which demonstrates compliance with the requirements of this Chapter.

X. Techniques described in Appendix F (Low Impact Development) of this Chapter are encouraged because they reduce the costs of complying with the requirements of this Chapter and the State Water Quality Requirements.

Y. Infiltration for stormwater management is encouraged where soils and geology permit, consistent with the provisions of this Chapter and, where appropriate, the Recommendation Chart for Infiltration Stormwater Management BMPs in Carbonate Bedrock in Appendix D.[2] Infiltration is encouraged for capturing and treating the Water Quality Volume (as calculated in **§ 296-15**), any part of the Water Quality volume or for otherwise meeting the purposes of this chapter.

§296-12 Exemptions

A. Regulated activities that result in cumulative earth disturbances less than one acre are exempt from the requirements in **§296-27, §296-28**, and Article VI of this Chapter.

B. Agricultural activity is exempt from the SWM Site Plan preparation requirements of this Chapter provided the activities are performed according to the requirements of 25 Pa. Code Chapter 102.

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

D. Exemptions from any provisions of this Chapter shall not relieve the applicant from the requirements in **§296-5 (D)(5)** through **§296-5 (D)(7)**.

E. The Township may deny or revoke any exemption pursuant to this Section at any time for any project that the Township believes may pose a threat to public health and safety or the environment.

§ 296-13 Permit requirements by other government entities

The following permit requirements apply to certain regulated and earth disturbance activities and must be met prior to commencement of regulated and earth disturbance activities, as applicable:

A. All regulated and earth disturbance activities subject to permit requirements by DEP under regulations at 25 Pa. Code Chapter 102.

B. Work within natural drainageways subject to permit by DEP under 25 Pa. Code Chapter 102.

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).

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.

§ 296-14 Erosion and sediment control during regulated earth disturbance activities

A. No regulated earth disturbance activities within the Township shall commence until approval by the Township of an erosion and sediment control plan for construction activities. Written approval by DEP or a delegated County Conservation District shall satisfy this requirement.

B. An erosion and sediment control plan is required by DEP regulations for any earth disturbance activity of 5,000 square feet or more under Pa. Code § 102.4(b) and must be approved by the Conservation District per memo of understanding.

C. A DEP NPDES Stormwater Discharges Associated with Construction Activities Permit is required for regulated earth disturbance activities under Pa. Code Chapter **92**.

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 Township before the commencement of earth disturbance activity.

E. A copy of the erosion and sediment control plan and any permit, as required by DEP regulations, shall be available at the project site at all times.

§ 296-15 Postconstruction water quality criteria

A. No regulated earth disturbance activities within the Township shall commence until approval by the Township of a drainage plan which demonstrates compliance with this

Chapter. This Chapter provides standards to meet NPDES permit requirements associated with construction activities and MS4 permit requirements.

B. The water quality volume (WQv) shall be captured and treated. The WQv shall be calculated two ways.

1. First, WQv shall be calculated using the following formula:

$$WQv = \frac{(c)(P)(A)}{12}$$

Where:

WQv	=	Water quality volume in acre-feet
c	=	Rational Method post-development runoff coefficient for the two-year storm
P	=	1.25 inches
A	=	Area in acres of proposed regulated activity

2. Second, the WQv shall be calculated as the difference in runoff volume from predevelopment to post-development for the two-year return period storm. The effect of closed depressions on the site shall be considered in this calculation. The larger of these two calculated volumes shall be used as the WQv to be captured and treated. This standard does not limit the volume of infiltration an applicant may propose for purposes of water quantity/peak rate control.

C. The WQv shall be calculated for each post-development drainage direction on a site for sizing BMPs. Site areas having no impervious cover and no proposed disturbance during development may be excluded from the WQv calculations and do not require treatment.

D. If an applicant is proposing to use a dry extended detention basin, wet pond, constructed wetland or other BMP that ponds water on the land surface and may receive direct sunlight, the discharge from that BMP must be treated by infiltration, a vegetated buffer, filter strip, bioretention, vegetated swale or other BMP that provides a thermal benefit to protect the high-quality waters of the Little Lehigh Creek from thermal impacts.

E. The WQv for a site as a result of the regulated activities must either be treated with infiltration or two acceptable BMPs such as those listed in Subsection **O**, except for minor areas on the periphery of the site that cannot reasonably be drained to an infiltration facility or other BMP.

F. Infiltration BMPs shall not be constructed on fill unless the applicant demonstrates that the

fill is stable and otherwise meets the infiltration BMP standards of this Chapter.

G. The applicant shall document the bedrock type(s) present on the site from published sources. Any apparent boundaries between carbonate and noncarbonate bedrock shall be verified through more detailed site evaluations by a qualified geotechnical professional.

H. For each proposed regulated activity in the watershed where an applicant intends to use infiltration BMP's, the applicant shall conduct a preliminary site investigation, including gathering data from published sources, a field inspection of the site, a minimum of one test pit and a minimum of two percolation tests, as outlined in Appendix G. This investigation will determine depth to bedrock, depth to the seasonal high-water table, soil permeability and location of special geologic features, if applicable. This investigation may be done by a certified Sewage Enforcement Officer (SEO) except that the location(s) of special geologic features shall be verified by a qualified geotechnical professional. Additionally, the Township Geotechnical Consultant or its authorized representative shall be notified of the soil testing in order to observe any such testing as determined to be necessary.

I. Sites where applicants intend to use infiltration BMPs must meet the following criteria:

1. Depth to bedrock below the invert of the BMP greater than or equal to two feet.

2. Depth to seasonal high-water table below the invert of the BMP greater than or equal to three feet; except for infiltration of residential roof runoff where the seasonal high-water table must be below the invert of the BMP. (If the depth to bedrock is between two and three feet and the evidence of the seasonal high-water table is not found in the soil, no further testing to locate the depth to seasonal high-water table is required.)

3. Soil permeability (as measured by the adapted 25 PA Code § 73.15. percolation test in Appendix G) greater than or equal to 0.5 inches/hour and less than or equal to 12 inches per hour.

4. Setback distances or buffers as follows:

   a. One hundred feet from water supply wells.

   b. Fifteen feet down gradient or 100 feet upgradient from building foundations; except for residential development where the required setback is 15 feet downgradient or 40 feet upgradient from building foundations.

   c. Fifty feet from septic system drainfields; except for residential development where the required setback is 25 feet from septic system

drainfields.

d. Fifty feet from a geologic contact with carbonate bedrock unless a preliminary site investigation is done in the carbonate bedrock to show the absence of special geologic features within 50 feet of the proposed infiltration area.

e. One hundred feet from the property line unless documentation is provided to show that all setbacks from existing or potential future wells, foundations and drainfields on neighboring properties will be met; except for one- and two-family residential dwellings where the required setback is 40 feet unless documentation is provided to show that all setbacks from existing or potential future wells, foundations and drainfields on neighboring properties will be met.

J. For entirely noncarbonate sites, the recharge volume (REv) shall be infiltrated unless the applicant demonstrates that it is infeasible to infiltrate the REv for reasons of seasonal high-water table, permeability rate, soil depth or setback distances; or except as provided in Subsection **U**.

1. The REv shall be calculated as follows:

REv = (0.25)*(I)/12
Where:

REv	=	Recharge volume in acre-feet
I	=	Impervious area in acres

2. The preliminary site investigation described in Subsection **H** is required and shall continue on different areas of the site until a potentially suitable infiltration location is found or the entire site is determined to be infeasible for infiltration. For infiltration areas that appear to be feasible based on the preliminary site investigation, the additional site investigation and testing as outlined in Appendix G shall be completed.

3. If an applicant proposes infiltration, the Township may determine infiltration to be infeasible if there are known existing conditions or problems that may be worsened by the use of infiltration.

4. The site must meet the conditions listed in Subsection **I**.

5. If it is not feasible to infiltrate the full REv, the applicant shall infiltrate that portion of the REv that is feasible based on the site characteristics. If none of the

REv can be infiltrated, REv shall be considered as part of the WQv and shall be captured and treated as described in Subsection **O**.

6. If REv is infiltrated, it may be subtracted from the WQv required to be captured and treated.

K. In entirely carbonate areas, where the applicant intends to us infiltration BMPs, the preliminary site investigation described in Subsection **H** shall be conducted. For infiltration areas that appear feasible based on the preliminary site investigation, the applicant shall conduct the additional site investigation and testing as outlined in Appendix G. The soil depth, percolation rate and proposed loading rate, each weighted as described in § **296-18**, along with the buffer from special geologic features shall be compared to the Recommendation Chart for Infiltration Stormwater Management BMPs in Carbonate Bedrock in Appendix D to determine if the site is recommended for infiltration. In addition to the recommendation from Appendix D, the conditions listed in Subsection **I** are required for infiltration in carbonate areas. Applicants are encouraged to infiltrate the REv, as calculated in Subsection **J**, but are not required to use infiltration BMPs on a carbonate site even if the site falls in the "Recommended" range on the chart in Appendix D. Any amount of volume infiltrated can be subtracted from the WQv to be treated by non-infiltration BMPs. If infiltration is not proposed, the full WQv shall be treated by two acceptable BMPs, as specified in Subsection **O**.

L. If a site has both carbonate and noncarbonate areas, the applicant shall investigate the ability of the noncarbonate portion of the site to fully meet this Chapter to meet the requirements for REv for the whole site through infiltration. If that proves infeasible, infiltration in the carbonate area as described in Subsection **K** or two other non-infiltration BMPs as described in Subsection **O** must be used. No infiltration structure in the noncarbonate area shall be located within 50 feet of a boundary with carbonate bedrock, except when a preliminary site investigation has been done showing the absence of special geologic features within 50 feet of the proposed infiltration area.

M. If infiltration BMPs are proposed in carbonate areas, the post-development two-year runoff volume leaving the site shall be 80% or more of the predevelopment runoff volume for the carbonate portion of the site to prevent infiltration of volumes far in excess of the predevelopment infiltration volume unless otherwise approved by Township Geotechnical Consultant and the Township Engineer.

N. Site areas proposed for infiltration shall be protected from disturbance and compaction except as necessary for construction of infiltration BMPs.

O. If infiltration of the entire WQv is not proposed, the remainder of the WQv shall be treated

by two acceptable BMPs in series for each discharge location. Sheet flow draining across a pervious area can be considered as one BMP. Sheet flow across impervious areas and concentrated flow shall flow through two BMPs. If sheet flow from an impervious area is to be drained across a pervious area as one BMP, the length of the pervious area must be equal to or greater than the length of impervious area. In no case may the same BMP be employed consecutively to meet the requirement of this section. Acceptable BMPs are listed below along with the recommended reference for design.

Best Management Practice	**Design Reference Number[C]**
Bioretention[A]	4, 5, 11, 16
Capture/reuse[B]	4, 14
Constructed wetlands	4, 5, 8, 10, 16
Dry extended detention ponds	4, 5, 8, 12, 18
Minimum disturbance/minimum maintenance practices	1, 9
Significant reduction of existing impervious cover	N/A
Stormwater filters[A] (sand, peat, compost, etc.)	4, 5, 10, 16
Vegetated buffers/filter strips	2, 3, 5, 11, 16, 17
Vegetated roofs	4, 13
Vegetated swales[A]	2, 3, 5, 11, 16, 17
Water quality inlets[D]	4, 7, 15, 16, 19
Wet detention ponds	4, 5, 6, 8

NOTES:

A This BMP could be designed with or without an infiltration component. If infiltration is proposed, the site and BMP will be subject to the testing and other infiltration requirements in this chapter.

B If this BMP is used to treat the entire WQv, then it is the only BMP required because of this BMPs superior water quality performance.

C See table below.

D Water quality inlets include such BMPs as oil/water separators, sediment traps/catch basin sumps, and trash/debris collectors in catch basins.

Design Reference Title

1 "Conservation Design For Stormwater Management — A Design Approach to Reduce Stormwater Impacts From Land Development and Achieve Multiple Objectives Related to Land Use," Delaware Department of Natural Resources and Environmental Control, The Environmental Management Center of the Brandywine Conservancy, September 1997.

Best Management Practice	Design Reference Number[C]
2	"A Current Assessment of Urban Best Management Practices: Techniques for Reducing Nonpoint Source Pollution in the Coastal Zone," Schueler, T. R., Kumble, P. and Heraty, M., Metropolitan Washington Council of Governments, 1992.
3	"Design of Roadside Channels with Flexible Linings," Federal Highway Administration, Chen, Y. H. and Cotton, G. K., Hydraulic Engineering Circular 15, FHWA-IP-87-7, McLean Virginia, 1988.
4	"Draft Stormwater Best Management Practices Manual," Pennsylvania Department of Environmental Protection, January 2005.
5	"Evaluation and Management of Highway Runoff Water Quality," Federal Highway Administration, FHWA-PD-96-032, Washington, D.C., 1996.
6	"Evaporation Maps of the United States," U.S. Weather Bureau (now NOAA/National Weather Service) Technical Paper 37, Published by Department of Commerce, Washington D.C., 1959.
7	"Georgia Stormwater Manual," AMEC Earth and Environmental, Center for Watershed Protection, Debo and Associates, Jordan Jones and Goulding, Atlanta Regional Commission, Atlanta, Georgia, 2001.
8	"Hydraulic Design of Highway Culverts," Federal Highway Administration, FHWA HDS 5, Washington, D.C., 1985 (revised May 2005).
9	"Low Impact Development Design Strategies An Integrated Design Approach," Prince Georges County, Maryland Department of Environmental Resources, June 1999.
10	"Maryland Stormwater Design Manual," Maryland Department of the Environment, Baltimore, Maryland, 2000.
11	"Pennsylvania Handbook of Best Management Practices for Developing Areas," Pennsylvania Department of Environmental Protection, 1998.
12	"Recommended Procedures for Act 167 Drainage Plan Design," LVPC, Revised 1997.
13	"Roof Gardens History, Design, and Construction," Osmundson, Theodore. New York: W.W. Norton and Company, 1999.
14	"The Texas Manual on Rainwater Harvesting," Texas Water Development Board, Austin, Texas, Third Edition, 2005.
15	"VDOT Manual of Practice for Stormwater Management," Virginia Transportation Research Council, Charlottesville, Virginia, 2004.
16	"Virginia Stormwater Management Handbook," Virginia Department of Conservation and Recreation, Richmond, Virginia, 1999.
17	"Water Resources Engineering," Mays, L. W., John Wiley and Sons, Inc., 2005.
18	"Urban Hydrology for Small Watersheds," Technical Report 55, US Department of Agriculture, Natural Resources Conservation Service, 1986.

Best Management Practice	Design Reference Number[C]
19	US EPA, Region 1 New England web site (as of August 2005) http://www.epa.gov/NE/assistance/ceitts/stormwater/techs/html.

P. Stormwater runoff from hot spot land uses shall be pretreated. In no case may the same BMP be employed consecutively to meet this requirement and the requirement in Subsection **O**. Acceptable methods of pretreatment are listed below.

Hot Spot Land Use	Pretreatment Method(s)
Vehicle maintenance and repair facilities, including auto parts stores	Water quality inlets
	Use of drip pans and/or dry sweep material under vehicles/equipment
	Use of absorbent devices to reduce liquid releases
	Spill prevention and response program
Vehicle fueling stations	Water quality inlets
	Spill prevention and response program
Storage areas for public works	Water quality inlets
	Use of drip pans and/or dry sweep material under vehicles/equipment
	Use of absorbent devices to reduce liquid releases
	Spill prevention and response program
	Diversion of stormwater away from potential contamination areas
Outdoor storage of liquids	Spill prevention and response program
Commercial nursery operations	Vegetated swales/filter strips
	Constructed wetlands
	Stormwater collection and reuse
Salvage yards and recycling facilities*	BMPs that are a part of a stormwater pollution

Hot Spot Land Use	Pretreatment Method(s)
	prevention plan under an NPDES permit
Fleet storage yards and vehicle cleaning facilities*	BMPs that are a part of a stormwater pollution prevention plan under an NPDES permit
Facilities that store or generate regulated substances*	BMPs that are a part of a stormwater pollution prevention plan under an NPDES permit
Marinas*	BMPs that are a part of a stormwater pollution prevention plan under an NPDES permit
Certain industrial uses (listed under NPDES)*	BMPs that are a part of a stormwater pollution prevention plan under an NPDES permit

NOTES:

* Regulated under the NPDES Stormwater Program

Design references for the pretreatment methods, as necessary, are listed below. If the applicant can demonstrate to the satisfaction of the municipality that the proposed land use is not a hot spot, then the pretreatment requirement would not apply.

Pretreatment Method	Design Reference[A]
Constructed wetlands	4, 5, 8, 10, 16
Diversion of stormwater away from potential contamination areas	4, 11
Stormwater collection and reuse (especially for irrigation)	4, 14
Stormwater filters (sand, peat, compost, etc.)	4, 5, 10, 16
Vegetated swales	2, 3, 5, 11, 16, 17
Water quality inlets	4, 7, 15, 16, 19

NOTES:

A These numbers refer to the Design Reference Title Chart in Subsection **O**, above.

Q. The use of infiltration BMPs is prohibited on hot spot land use areas unless otherwise approved by Township Geotechnical Consultant and the Township Engineer.

R. Stormwater infiltration BMPs shall not be placed in or on a special geologic feature(s). Additionally, stormwater runoff shall not be discharged into existing on-site sinkholes.

S. Applicants shall request, in writing, public water suppliers to provide the Zone I Wellhead Protection radius, as calculated by the method outlined in the Pennsylvania Department of Environmental Protection Wellhead Protection regulations, for any public water supply well within 400 feet of the site. In addition to the setback distances specified in Subsection **I**, infiltration is prohibited in the Zone I radius as defined and substantiated by the public water supplier in writing. If the applicant does not receive a response from the public water supplier, the Zone I radius is assumed to be 100 feet.

T. The volume and rate of the net increase in stormwater runoff from the regulated activities must be managed to prevent the physical degradation of receiving waters from such effects as scour and stream bank destabilization, to satisfy state water quality requirements, by controlling the two-year post-development runoff to a 30% release rate.

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

§ 296-16 Stormwater management districts

A. Mapping of Stormwater management districts. To implement the provisions of the Little Lehigh Creek Watershed, Coplay Creek Watershed and Jordan Creek Watershed stormwater management plan, the Township is hereby divided into stormwater management districts consistent with the Little Lehigh Creek, Coplay Creek and Jordan Creek release rate maps presented in the plan. The boundaries of the stormwater management districts are shown on an official map which is available for inspection at the Township Community Development Department office. A copy of the official map at a reduced scale is included in Appendix A for general reference.

B. Description of stormwater management districts. Two types of stormwater management districts may be applicable to the Township, namely conditional/provisional no detention districts and dual release rate districts as described below:

1. Conditional/provisional no detention districts. Within these districts, the capacity of the "local" runoff conveyance facilities (as defined in Article **II**) must be calculated to determine if adequate capacity exists. For this determination, the developer must calculate peak flows assuming that the site is developed as proposed and that the remainder of the local watershed is in the existing condition. The developer must also calculate peak flows assuming that the entire local watershed is developed per current zoning and that all new development would use the runoff controls specified by this Chapter. The larger of the two peak flows calculated will be used in determining if adequate capacity exists. If adequate capacity exists to safely transport runoff from the site to the main channel these watershed areas may discharge post-development peak runoff without detention facilities. If the capacity calculations show that the local runoff conveyance facilities lack adequate capacity, the developer shall either use a 100% release rate control or provide increased capacity of downstream elements to convey increased peak flows consistent with § **296-17P**. Any capacity improvements must be designed to convey runoff from development of all areas tributary to the improvement consistent with the capacity criteria specified in § **296-17D**. By

definition, a storm drainage problem area associated with the local runoff conveyance facilities indicates that adequate capacity does not exist. Sites in these districts are still required to meet all of the water quality requirements in § **296-15**.

2. Dual release rate districts. Within these districts, the two-year post-development peak discharge must be controlled to 30% of the predevelopment two-year runoff peak. Further, the ten-year-, twenty-five-year- and one-hundred-year post-development peak runoff must be controlled to the stated percentage of the predevelopment peak. Release rates associated with the ten- through one-hundred-year events vary from 50% to 100% depending upon location in the watershed.

§ 296-17 Stormwater management district implementation provisions

A. Applicants shall provide a comparative pre- and post-construction stormwater management hydrograph analysis for each direction of discharge and for the site overall to demonstrate compliance with the provisions of this Chapter.

B. Any stormwater management controls required by this Chapter and subject to a dual release rate criteria shall meet the applicable release rate criteria for each of the two- , ten- , twenty-five- and one-hundred-year return period runoff events consistent with the calculation methodology specified in § **296-18**.

C. The exact location of the stormwater management district boundaries as they apply to a given development site shall be determined by mapping the boundaries using the two-foot topographic contours provided as part of the drainage plan. The district boundaries as originally drawn coincide with topographic divides or, in certain instances, are drawn from the intersection of the watercourse and a physical feature such as the confluence with another watercourse or a potential flow obstruction (e.g., road, culvert, bridge, etc.). The physical feature is the downstream limit of the subarea and the subarea boundary is drawn from that point up slope to each topographic divide along the path perpendicular to the contour lines.

D. Any downstream capacity analysis conducted in accordance with this Chapter shall use the following criteria for determining adequacy for accepting increased peak flow rates:

1. Natural or man-made channels or swales must be able to convey the increased runoff associated with a two-year return period event within their banks at velocities consistent with protection of the channels from erosion.

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

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

E. For a proposed development site located within one release rate category subarea, the total runoff from the site shall meet the applicable release rate criteria. For development sites with multiple directions of runoff discharge, individual drainage directions may be designed for up to a 100% release rate so long as the total runoff from the site is controlled to the applicable release rate.

F. For a proposed development site located within two or more release category subareas, the peak discharge rate from any subarea shall be the predevelopment peak discharge for that subarea multiplied by the applicable release rate. The calculated peak discharges shall apply regardless of whether the grading plan changes the drainage area by subarea. An exception to the above may be granted if discharges from multiple subareas recombine in proximity to the site. In this case, peak discharge in any direction may be a 100% release rate provided that the overall site discharge meets the weighted average release rate.

G. For a proposed development site located partially within a release rate category subarea and partially within a conditional/provisional no detention subarea, the size of the predevelopment drainage area on a site may not be changed post-development to create potentially adverse conditions on downstream properties except as part of a no harm or hardship waiver procedure.

H. No portion of a site may be regraded to redirect runoff onto adjacent property except as part of a no harm or hardship waiver procedure, or unless runoff peak flow rate and volume controls are proposed and implemented which limit post-development peak flow rate and volume discharges to predevelopment levels, or all affected downstream property owners have granted express permission in the form of recorded easements.

I. Within a release rate category area, for a proposed development site which has areas which drain to a closed depression(s), the design release from the site will be the lesser of (1) the applicable release rate flow assuming no closed depression(s) or (2) the existing peak flow actually leaving the site. In cases where (2) would result in an unreasonably small design release, the design discharge of less than or equal to the release rate will be determined by the available downstream conveyance capacity to the main channel calculated using Subsection **D** and the minimum orifice criteria.

J. Off-site areas which drain through a proposed development site are not subject to release rate criteria when determining allowable peak runoff rates. However, on-site drainage

facilities shall be designed to safely convey off-site flows through the development site using the capacity criteria in Subsection **D** and the detention criteria in § **296-18**.

K. For development sites proposed to take place in phases, all detention ponds shall be designed to meet the applicable release rate(s) applied to all site areas tributary to the proposed pond discharge direction. All site tributary areas will be assumed as developed, regardless of whether all site tributary acres are proposed for development at that time. An exception shall be sites with multiple detention ponds in series where only the downstream pond must be designed to the stated release rate.

L. Where the site area to be impacted by a proposed development activity differs significantly from the total site area, only the proposed impact area shall be subject to the release rate criteria. The impact area includes any proposed cover or grading changes.

M. Development proposals which, through groundwater recharge or other means, do not increase either the rate or volume of runoff discharged from the site compared to predevelopment are not subject to the release rate provisions of this Chapter.

N. "No harm" water quantity option. For any proposed development site not located in a conditional/provisional no detention district, the developer has the option of using a less restrictive runoff control (including no detention) if the developer can prove that special circumstances exist for the proposed development site and that no harm would be caused by discharging at a higher runoff rate than that specified by the plan. Special circumstances are defined as any hydrologic or hydraulic aspects of the development itself not specifically considered in the development of the plan runoff control strategy. Proof of no harm would have to be shown from the development site through the remainder of the downstream drainage network to the confluence of the creek with the Delaware or Lehigh River. Proof of no harm must be shown using the capacity criteria specified in Subsection **D** if downstream capacity analysis is a part of the no harm justification. Attempts to prove no harm based upon downstream peak flow versus capacity analysis shall be governed by the following provisions:

1. The peak flow values to be used for downstream areas for the design return period storms (two-, ten-, twenty-five- and one-hundred-year) shall be the values from the calibrated PSRM Model for the Little Lehigh Creek, Coplay Creek or Jordan Creek or as calculated by an applicant using an alternate method acceptable to the municipality. The flow values from the PSRM Model would be supplied to the developer by the Lehigh Valley Planning Commission upon request.

2. Any available capacity in the downstream conveyance system as documented by a developer may be used by the developer only in proportion to his development

site acreage relative to the total upstream undeveloped acreage from the identified capacity (i.e., if his site is 10% of the upstream undeveloped acreage, he may use up to 10% of the documented downstream available capacity).

3. Developer-proposed runoff controls which would generate increased peak flow rates at storm drainage problem areas would, by definition, be precluded from successful attempts to prove no harm, except in conjunction with proposed capacity improvements for the problem areas consistent with Subsection **P**.

Any no harm justifications shall be submitted by the developer as part of the drainage plan submission per Article **IV**. Developers submitting no harm justifications must still meet all of the water quality requirements in § **296-15**.

O. Regional detention alternatives. For certain areas within the study area, it may be more cost-effective to provide one control facility for more than one development site than to provide an individual control facility for each development site. The initiative and funding for any regional runoff control alternatives are the responsibility of prospective developers. The design of any regional control basins must incorporate reasonable development of the entire upstream watershed. The peak outflow of a regional basin would be determined based on the required release rate at the point of discharge.

P. Capacity improvements. In certain instances, primarily within the conditional/provisional no detention areas, local drainage conditions may dictate more stringent levels of runoff control than those based upon protection of the entire watershed. In these instances, if the developer could prove that it would be feasible to provide capacity improvements to relieve the capacity deficiency in the local drainage network, then the capacity improvements could be provided by the developer in lieu of runoff controls on the development site. Peak flow calculations shall be done assuming that the local watershed is in the existing condition and then assuming that the local watershed is developed per current zoning and using the specified runoff controls. Any capacity improvements would be designed using the larger of the above peak flows and the capacity criteria specified in Subsection **D**. All new development in the entire subarea(s) within which the proposed development site is located shall be assumed to implement the developer's proposed discharge control, if any. Capacity improvements may also be provided as necessary to implement any regional detention alternatives or to implement a modified no harm option which proposes specific capacity improvements to provide that a less stringent discharge control would not create any harm downstream.

Q. Compatibility with NPDES requirements. Any proposed regulated activity for which a permanent stormwater quality control detention basin is required under the NPDES regulations shall use the more stringent runoff control criteria between this Chapter and the

NPDES requirements.

R. In any stormwater management district, the Township reserves the right to require a more stringent design release rate for a development site or other amendments to a drainage plan to address problems in the local runoff conveyance system downstream of the site. Such problems include existing flooding and erosion problems, inadequate conveyance capacity, poorly defined or poorly stabilized downstream conveyance systems or other factors; or for other good cause shown; and supported by engineering data of the kind and type commonly accepted by the civil engineering profession in the evaluation and management of stormwater runoff.

S. In any stormwater management district, storm sewer piping, swales and inlet systems shall be designed for a twenty-five-year return period storm, or a one-hundred-year return period storm where the system is designed to convey one-hundred-year storm flows to a detention facility. Bridges and culverts along roadways shall be designed to convey the one-hundred-year return period storm. Flows from off-site upstream areas shall be determined in accordance with the procedure identified in § **296-11O**.

§ **296-18 Calculation methodology**

A. Stormwater runoff from all development sites shall be calculated using either the Rational Method or the Soil-Cover-Complex methodology.

B. Infiltration BMP loading rate percentages in the Recommendation Chart for Infiltration Stormwater Management BMPs in Carbonate Bedrock in Appendix D shall be calculated as follows:

$$\frac{\textbf{Area Tributary to infiltration BMP}}{\text{Base area of infiltration BMP}} \textbf{*100\%}$$

The area tributary to the infiltration BMP shall be weighted as follows:

All disturbed areas to be made impervious:	weight at 100%
All disturbed areas to be made pervious:	weight at 50%
All undisturbed pervious areas:	weight at 0%
All existing impervious areas:	weight at 100%

C. Soil thickness is to be measured from the bottom of any proposed infiltration system. The effective soil thickness in the Recommendation Chart for Infiltration Stormwater Management BMPs in Carbonate Bedrock in Appendix D is the measured soil thickness multiplied by the thickness factor based on soil permeability (as measured by the adapted 25 PA Code § 73.15 percolation test in Appendix G), as follows:

Permeability Range*	Thickness Factor
6.0 to 12.0 inches/hour	0.8
2.0 to 6.0 inches/hour	1.0
1.0 to 2.0 inches/hour	1.4
0.75 to 1.0 inches/hour	1.2
0.5 to 0.75 inches/hour	1.0

NOTES:

* If the permeability rate (as measured by the adapted 25 PA Code § 73.15 percolation test in Appendix G) falls on a break between two thickness factors, the smaller thickness factor shall be used.

Sites with soil permeability greater than 12.0 in/hr or less than 0.5 in/hr, as measured by the adapted 25 PA Code § 73.15 percolation test in Appendix G, are not recommended for infiltration.

D. The design of any detention basin intended to meet the requirements of this Chapter shall be verified by routing the design storm hydrograph through the proposed basin using the storage indication method or other methodology demonstrated to be more appropriate. For basins designed using the Rational Method technique, the design hydrograph for routing shall be the Universal Rational Hydrograph unless another methodology is approved by the Township.

E. BMPs designed to store or infiltrate runoff and discharge to surface runoff or pipe flow shall be routed using the storage indication method.

F. BMPs designed to store or infiltrate runoff and discharge to surface runoff or pipe flow shall provide storage volume for the full WQv below the lowest outlet invert.

G. Wet detention ponds designed to have a permanent pool for the WQv shall assume that the permanent pool volume below the primary outlet is full at the beginning of design event routing for the purposes of evaluating peak outflows. All wet detention ponds shall be subject to review by the Township Geotechnical Consultant.

H. All stormwater detention facilities shall provide a minimum 1.0-foot freeboard above the maximum pool elevation associated with the two- through twenty-five-year runoff events. A 0.5-foot freeboard shall be provided above the maximum pool elevation of the one-hundred-year runoff event. The freeboard shall be measured from the maximum pool elevation to the invert of the emergency spillway. The two through one-hundred-year storm events shall be controlled by the primary outlet structure. An emergency spillway for each basin shall be designed to pass the one-hundred-year return frequency storm peak basin inflow rate with a minim 0.5 feet freeboard measured to the top of basin. The freeboard criteria shall be met considering any off-site areas tributary to the basin as developed, as applicable. If this

detention facility is considered to be a dam as per DEP Chapter 105, the design of the facility must be consistent with the Chapter 105 regulations and may be required to pass a storm greater than the one-hundred-year event.

I. The minimum circular orifice diameter for controlling discharge rates from detention facilities shall be three inches. Designs where a lesser size orifice would be required to fully meet release rates shall be acceptable provided that as much of the site runoff as practical is directed to the detention facilities.

J. Runoff calculations using the Soil-Cover-Complex Method shall use the Natural Resources Conservation Service Type II twenty-four-hour rainfall distribution. The twenty-four-hour rainfall depths for the various return periods to be used consistent with this chapter may be taken from the latest version of the field manual for Pennsylvania Design Rainfall Intensity Charts from NOAA Atlas 14.

Return Period	**24 Hour Rainfall Depth**
1 year	2.40 inches
2 year	3.00 inches
5 year	3.60 inches
10 year	4.56 inches
25 year	5.52 inches
50 year	6.48 inches
100 year	7.44 inches

NOTES:

A graphical and tabular presentation of the Type II 24 hour distribution is included in Appendix C.

K. Runoff calculations using the Rational Method shall use rainfall intensities consistent with appropriate times of concentration and return periods and NOAA Atlas 14 and the Atlas of the United States Precipitation and Precipitation Frequency Charts, current version.

L. Runoff Curve Numbers (CN's) to be used in the soil-cover-complex method shall be based upon the matrix presented in Appendix C.

M. Runoff coefficients for use in the Rational Method shall be based upon the table presented in Appendix C.

N. All time of concentration calculations shall use a segmental approach which may include on or all of the flow types below:

1. Sheet Flow (overland flow) calculations shall use either the NRCS average

velocity chart (Figure 3-1, Technical Release-55, 1975) or the modified kinematic wave travel time equation (equation 3-3, NRCS TR-55, June 1986). If using the modified kinematic wave travel time equation, the sheet flow length shall be limited to 50 feet for designs using the Rational Method and limited to 150 feet for designs using the Soil-Cover-Complex method.

2. Shallow concentrated flow travel times shall be determined from the watercourse slope, type of surface and the velocity from Figure 3-1 of TR-55, June 1986.

3. Open channel flow travel times shall be determined from velocities calculated by the Manning Equation. Bankfull flows shall be used for determining velocities. Manning 'n' values shall be based on the table presented in Appendix C.

4. Pipe flow travel times shall be determined from velocities calculated using the Manning Equation assuming full flow and the Manning 'n' values from Appendix C.

O. If using the Rational Method, all predevelopment calculations for a given discharge direction shall be based on a common time of concentration considering both on-site and off-site drainage areas. All post-development calculations for a given discharge direction shall be based on a common time of concentration considering both on-site and any off-site drainage areas.

P. The Manning Equation shall be used to calculate the capacity of watercourses. Manning 'n' values used in the calculations shall be consistent with the table presented in Appendix C or other appropriate standard engineering 'n' value resources. Pipe capacities shall be determined by methods acceptable to the Township Engineer.

Q. The Pennsylvania DEP, Chapter 105, Rules and Regulations, applies to the construction, modification, operation or maintenance of both existing and proposed dams, water obstructions and encroachments throughout the watershed. Criteria for design and construction of stormwater management facilities according to this Chapter may differ from the criteria that are used in the permitting of dams under the Dam Safety Program.

R. Storm Drainage

1. General Requirements. Stormwater management facilities shall be provided where necessary to adequately control storm runoff in accordance with all applicable state and local laws and to protect the general public and prevent undue damage to public and private property. To the extent that the provisions of this section conflict with any Stormwater Management Plan adopted by the Township, the more stringent criteria

shall prevail.

a. Any proposed storm drainage plans which affect the drainage basin of any river or stream shall be approved by the Pennsylvania Department of Environmental Protection if the drainage basin so affected has an area of at least one-half (0.5) square mile.

b. Storm sewers, culverts, and related installations shall be provided to permit the unimpeded flow of natural watercourses, to ensure the drainage of all low points on the reasonably related to the extent and grade of the area drained. The system shall also be designed in accordance with **§ 296-17S**.

    i. Developers shall dedicate easements, pipe collection systems and structures for storm drainage to the Township.

c. No storm water run-off or natural drainage water shall be so diverted as to overload existing drainage systems or create flooding or the need for additional drainage structures on other private or public lands, without proper and approved provisions being made for taking care of these conditions.

    i. The Township Board of Commissioners with the advice of the Township Engineer shall decide what provisions, including but not limited to suitable detention basins shall be made to implement Section 312-39(a)(3). Where stormwater management facilities are permitted, adequate assurances of maintenance, indemnification, liability insurance and security shall be provided by agreement with the Township, which agreement shall be approved by the Township Solicitor.

d. In areas in which street curbs are not required by the Township Board of Commissioners or Township Engineer, drainage may be accomplished by natural or artificial swales and culverts. Special structures such as check dams, drop-outlets, permanent detention basins or other energy dissipating structures or riprap may be required to prevent scour or erosion in locations with large run-off quantities or high velocities.

    i. Developers shall dedicate easements and/or structures for storm drainage to the Township pursuant to Section 312-39(a)(4) where swales and/or culverts traverse or enter onto private property.

    ii. The Township Board of Commissioners may require a fixed pipe collection system with catch basins.

e. A subsurface collection system with catch basins shall be used in all areas

in which street curbs and gutters are required.

i. Underdrain pipe systems shall be required where soil conditions warrant their installation.

f. Developer shall grade and install all necessary drainage facilities to ensure the drainage of all low points on subdivided lots or within the subdivision.

g. Designs Of Storm Drainage Systems.

i. Designs shall be prepared, signed, and sealed by a licensed professional engineer.

ii. Complete detailed calculations shall be submitted to the Township Engineer for his approval.

iii. All designs must be reviewed and approved by the Township Engineer.

2. Collection System. The collection system shall be designed by the Rational Method of Design in accordance with American Society of Civil Engineers Manual No. 37 except as noted using the formula Q=CiA, as amplified by the following sections.

a. "Q" is the required capacity in cubic feet per second for the collection system at the point of design.

b. "C" is the run-off coefficient applicable to the entire drainage area. It shall be based on consideration of soil conditions, average slope of the drainage area and the ultimate development of the entire drainage area according to comprehensive plans. For various types of ultimate development, the run-off coefficient shall be within the ranges specified in accordance with Section 296-18M.

c. "i" is the rainfall intensity in inches per hour and shall be determined from a calculated time of concentration and specified. storm frequency. Time of concentration shall be computed in accordance with the requirements contained in Section 296-18K. Design storm frequencies shall be 25-year for residential and all other developments. Rainfall intensities shall be in accordance with Section 296-18K. Any conveyance system designed to transport runoff from a tributary area of greater than 100 acres shall be designed for the 100-year frequency design storm.

d. "A" is the drainage area, in acres, tributary to the point of design, and shall include tributary from outside sources as well as from within the subdivision itself. All calculations shall be accompanied by a drainage area map showing all areas tributary to each structure or discharge point.

e. Pipes and conduits shall be designed on the basis of Manning's formula and the Continuity Equation.

$v = 1.486/n*r^{2/3}*s^{1/2}$

"v" is the mean velocity of flow in feet per second.

"n" is the coefficient of roughness.

n equals 0.013 for concrete pipe.

n equals 0.021 for asphalt coated corrugated metal pipe, 25 percent (25%) paved.

"r" is the hydraulic radius in feet.

"s" is the slope of the energy grade line.

"Q" equals VA where "A" equals cross-sectional area in square feet.

$Q = V * A$

f. Culverts shall be designed on the basis of inlet or outlet control as appropriate, except where a more detailed backwater analysis is deemed warranted by the Township Engineer.

g. Manholes shall be spaced at intervals not exceeding four hundred (400) feet and shall be located wherever branches are connected or sizes are changed and wherever there is a change in alignment or grade.

h. For sewer lines of at least thirty-six (36) inches diameter, manholes may be spaced at intervals greater than four hundred (400) feet with the approval of the Township Engineer.

i. Sewer lines shall be located between the centerline of the street and the curb line and shall parallel the centerline of the street as far as practical. Sufficient number of structures shall be provided such that unnecessary crossings of other utility lines and passage beneath curbs are eliminated.

j. Culvert and/or hydraulic grade analysis, and inlet grate capacity calculations, shall be provided with storm sewerage system design calculations.

3. Swales. Swales used for outlets shall be designed on the basis of Manning's formula with the following considerations:

a. The roughness coefficient shall be:
0.040 for earth swales, and 0.015 for paved swales.

b. Design velocity in earth swales shall not exceed four (4) feet per second.

c. A swale right-of-way of sufficient minimum width to include a ten (10) foot access strip in addition to the width of the swale from bank top, shall

be offered for dedication to the Township for drainage purposes. The Township Engineer may, under unusual conditions, require a wider swale right-of-way.

d. Side or rear yard swales upstream or downstream of pipe culverts will be permitted only under the following conditions. If any one of these conditions cannot be met the stormwater shall be piped in an underground system.

i. The diameter of the pipe culvert does not exceed 18 inches and the depth of flow in the swale for a 25 year frequency storm is less than 1 foot;

ii. The side slopes of the swale are not steeper than 4 horizontal to 1 vertical (4:1). An easement of sufficient width to encompasses the design full flow cross section plus 1 foot of freeboard at the design cross slope shall be offered for dedication to the Township;

iii. A note shall be added to the plan to be recorded that the ground surface elevations in any such drainage easements may not be altered by the property owner without the express, advance, written permission of the Township Board of Commissioners;

iv. Flared end sections shall be provided on the open pipe ends in lieu of headwalls. The pipe shall be extended as far as is necessary to achieve a maximum 4:1 slope on the roadway embankment commencing at the edge of right-of-way in the case of a curbed roadway or at the edge of shoulder in the case of a non-curbed roadway.

4. Detention Basins.

a. Permanent detention basins may be required by the Township Engineer or Township Board of Commissioners as part of a Storm Water Drainage Plan when the rate of runoff after development will exceed the pre-development condition.

b. Detention basins shall be designed to drain completely after every storm in order to avoid problems associated with stagnant water unless as otherwise approved by the Board of Commissioners upon recommendation of the Township Geotechnical Consultant. Basins located in residential areas should have very flat slopes (less than 4 horizontal to 1 vertical) and shallow water depths (less than 30"). A minimum longitudinal slope of two percent shall be provided across the basin floor. Detention Basin designs shall be in accordance with Township Standard Construction Documents (latest revision).

c. Fencing shall be required around detention basins in the following cases:

i. The maximum depth of water in the basin for a 10 year or a storm of greater intensity design storm is greater than 30";

ii. The side slopes of the basin are steeper than four (4) horizontal to one (1) vertical;

iii. The time to empty the basin is longer than 3 hours;

iv. The detention basin is to be dedicated to South Whitehall Township, and fencing is requested by the Township; or

v. The Board of Commissioners determines that the public safety would be endangered if the basin is not fenced.

d. Fencing and associated warning signs shall be in accordance with the Township Standard Construction Documents (latest revision).

e. Outflow pipes shall be provided with child-proof screening.

f. Detention basin design shall be based upon the general design requirements of Township Stormwater Management Plan which provides for stormwater management.

g. The rate of outflow from the basin shall be restricted in accordance with the current provisions of the Act 167 Stormwater Management Regulations.

h. A minimum 12-foot wide ramp at a maximum 10 percent slope shall be constructed near the basin access fence to permit access to the bottom of basins for maintenance.

i. Anti-seep collars shall be provided along basin discharge pipes.

j. In sinkhole prone soils, detention basins shall be lined with a material in accordance with Section 296-11T.

5. Soil Erosion and Sedimentation Control.

a. No changes shall be made in the contour of the land, no grading, excavation, removal or destruction of the topsoil, trees, or other vegetative cover of the land shall be commenced until such time that a plan for minimizing erosion and sedimentation has been reviewed and approved by the representative for the Lehigh County Conservation District, South

Whitehall Township and the Board of Commissioners.

b. No subdivision plan shall be approved unless (1) there has been a plan approved by the representative for the Lehigh County Conservation District and the South Whitehall Township Board of Commissioners that provides in the opinion of the South Whitehall Township Board of Commissioners for minimizing erosion and sedimentation and acceptable securities are deposited with the Township in the form of an escrow guarantee which will ensure installation and completion of the required improvements; or (2) there has been a determination by the representative for the Lehigh County Conservation District and the South Whitehall Township Board of Commissioners that a plan for minimizing erosion and sedimentation is not necessary.

c. Measures used to control erosion and reduce sedimentation shall comply with the standards and specifications of the Lehigh County Conservation District and receive the approval of the District. Once the subdivision plans have been finally approved, the District shall ensure compliance with the appropriate specifications and plans.

d. Whenever sedimentation is caused by stripping vegetation, regrading, or other development, it shall be the responsibility of the person, corporation, or other entity causing such sedimentation to remove it from all adjoining surfaces, drainage systems, watercourses, roads, and rights-of-way, and to repair any damage at this expense within twenty-four (24) hours of the occurrence.

e. Each person, corporation or other entity which makes any surface changes shall be required to:

   i. Collect on-site surface runoff and dispose of it to the point of discharge into the common natural watercourse of the drainage area.

   ii. Handle existing and potential off-site runoff through his development by designing to adequately handle storm runoff from a fully developed area upstream.

   iii. Provide and install at his expense, in accordance with Township requirement, all drainage and erosion control improvements (temporary and permanent) as required by the Erosion and Sediment Control Plan.

f. SMP Section 296-11 also contains requirements associated with Soil Erosion and Sedimentation Control Plans.

6. General Design Standards.

   a. Curb inlets shall be located at curb tangents on the uphill side of street intersections. The Township Engineer shall approve design and location of curb inlets.

   b. Drainage structures that are located on State Highway rights-of-way shall be approved by the Pennsylvania Department of Transportation, and a letter from that office indicating such approval shall be directed to the Township Planning Commission.

   c. The design of the storm sewerage system shall be in accordance with the Township Standard Construction Documents (latest revision).

7. Construction Specifications. Township Standard Construction Documents (latest revision) as adopted by the Township will govern. Copies are available at the Township Building upon request and payment of cost of reproduction.

8. The following statements shall be provided on the plans to be recorded:

   "Notwithstanding any provisions of the Township Storm Water Management Plan, including exemption and waiver provisions, any landowner and any person engaged in the alteration or development of land which may affect storm water runoff characteristics shall implement such measures as are reasonably necessary to prevent injury to health, safety or other property. Such measures shall include such actions as are required to manage the rate volume, direction and quality of resulting storm water runoff in a manner which otherwise adequately protects health and property from injury and damage."

   "Township review and approval of the drainage plan or the subsequent observation and approval of storm water management facilities, shall not constitute land development on behalf of or by the Township or otherwise cause the Township to be engaged in the alteration or development of land. By submitting an application under the Township Storm Water Management Plan, the Developer hereby agrees to indemnify, defend, and hold harmless the Township and all its representatives, servants, employees, officials and consultants of and from any and all claims demands, causes of action or suits which arise out of or relate to the review, approval, construction or observation of the Developer's drainage plan and storm water management facilities."

Article IV
Drainage Plan Requirements

§ 296-19 General requirements

For any of the regulated activities of this Chapter, prior to the final approval of subdivision and/or land development plans, or the issuance of any permit, or the commencement of any land

disturbance activity, the owner, subdivider, developer or his agent shall submit a drainage plan for approval.

§ 296-20 Drain Plan Exemptions

A. Impervious cover. Any proposed regulated activity, except those defined in **§ 296-5D (5)** and **(6)**, which would create 10,000 square feet or less of additional impervious cover is exempt from the drainage plan preparation provisions of this Chapter. All of the impervious cover added incrementally to a site above the initial 10,000 square feet shall be subject to the drainage plan preparation provisions of this Chapter. If a site has previously received an exemption and is proposing additional development such that the total impervious cover on the site exceeds 10,000 square feet, the total impervious cover on the site proposed since the original ordinance date must meet the provisions of this Chapter.

1. The date of the Township ordinance adoption of the original Act 167 Stormwater Management Ordinance shall be the starting point from which to consider tracts as "parent tracts" in which future subdivisions and respective impervious area computations shall be cumulatively considered. Predevelopment impervious cover is that which is in place as of May 18, 1989, within the Little Lehigh Creek Watershed, March 17, 1993, within the Jordan Creek Watershed, and March 1, 1995, within the Coplay Creek Watershed. These dates reflect the original ordinance adoption date in each watershed.

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

3. Additional impervious cover shall include, but not be limited to, additional indoor living spaces, decks, patios, garages, driveways, storage sheds and similar structures, any roof, parking or driveway areas and any new streets and sidewalks constructed as part of or for the proposed regulated activity.

4. Any additional areas proposed to initially be gravel, crushed stone, porous pavement, etc., shall be assumed to be impervious for the purposes of comparison to the exemption criteria. Any existing gravel, crushed stone or hard packed soil areas on a site shall be considered as previous cover for the purpose of exemption evaluation.

B. Prior drainage plan approval. Any regulated activity for which a drainage plan was previously prepared as part of a subdivision or land development proposal that received preliminary plan approval from the Township prior to the effective date of this Chapter is exempt from the drainage plan preparation provisions of this Chapter, except as cited in Subsection **C**, provided that the approved drainage plan included design of stormwater facilities to control runoff from the site currently proposed for regulated activities consistent

with ordinance provisions in effect at the time of approval and the approval has not lapsed under the Municipalities Planning Code. If significant revisions are made to the drainage plan after both the preliminary plan approval and the effective date of this Chapter, preparation of a new drainage plan, subject to the provisions of this Chapter, shall be required. Significant revisions would include a change in control methods or techniques, relocation or redesign of control measures or changes necessary because soil or other conditions are not as stated on the original drainage plan.

C. These exemptions shall not relieve the applicant from implementing such measures as are necessary to protect health, safety, property, and state water quality requirements. These measures include adequate and safe conveyance of stormwater on the site and as it leaves the site. These exemptions do not relieve the applicant from the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act, or ordinance.

D. No exemptions shall be provided for regulated activities as defined in § **296-5D (5)** and **(6)**.

§ 296-21 Drainage plan contents

The following items shall be included in the drainage plan:

A. General.

1. General description of project.

2. General description of proposed permanent stormwater controls.

3. The name and address of the project site, the name and address of the owner of the property and the name of the individual or firm preparing the drainage plan.

B. Map(s) of the project area showing:

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

2. Existing contours at intervals of two feet. In areas of steep slopes (greater than 15%), five-foot contour intervals may be used. Off-site drainage areas impacting the project including topographic detail.

3. Streams, lakes, ponds or other bodies of water within the project area.

4. Other features, including flood hazard boundaries, existing drainage swales, wetlands, closed depressions, sinkholes and areas of natural vegetation to be

preserved.

5. Locations of proposed underground utilities, sewers and water lines. The locations of all existing and proposed utilities, sanitary sewers and water lines within 50 feet of property lines of the project site.

6. An overlay showing soil types and boundaries based on the Lehigh County Soil Survey, as applicable, latest edition. Any hydric soils present on the site should be identified as such.

7. Proposed changes to land surface and vegetative cover.

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

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

10. Stormwater management district boundaries applicable to the site.

11. A schematic showing all tributaries contributing flow to the site and all existing man-made features beyond the property boundary that would be affected by the project.

12. Clear identification of the location and nature of permanent stormwater BMPs.

13. An adequate access easement around all stormwater BMPs that would provide Township ingress to and egress from a public right-of-way.

14. The location of all public water supply wells within 400 feet of the project and all private water supply wells within 100 feet of the project.

15. An overlay showing geologic types, boundaries and any special geologic features present on the site.

C. Stormwater management controls and BMPs.

1. All stormwater management controls must be shown on a map and described, including:

a. Groundwater recharge methods such as seepage pits, beds or trenches. When these structures are used, the locations of septic tank infiltration areas and wells must be shown.

b. Other control devices or methods such as rooftop storage, semipervious paving materials, grass swales, parking lot ponding, vegetated strips, detention or retention ponds, storm sewers, etc.

2. All calculations, assumptions and criteria used in the design of the control device or method must be shown.

3. A chart describing the maximum allowable impervious cover per lot based upon the stormwater management calculations.

4. All site testing data used to determine the feasibility of infiltration on a site.

5. All details and specifications for the construction of the stormwater management controls and BMPs.

D. The BMP operations and management plan, as required in Article **VII**, describing how each permanent stormwater BMP will be operated and maintained and the identity of the person(s) responsible for operations and maintenance. A statement must be included, signed by the landowner, acknowledging that the stormwater BMPs are fixtures that cannot be altered or removed without approval by the Township.

E. An environmental resources site design assessment that describes the following:

1. The extent to which the proposed grading and impervious cover avoid disturbance of significant environmental resources and preserve existing site hydrology.

2. An assessment of whether alternative grading and impervious cover site design could lessen the disturbance of significant environmental resources and/or make better use of the site hydrologic resources.

3. A description of how the proposed stormwater management controls and BMPs serve to mitigate any adverse impacts on environmental resources on the site.

Significant environmental resources considered in the site design assessment include, but are not limited to, steep slopes, ponds, lakes, streams, wetlands, hydric soils, floodplains, riparian vegetation, native vegetation and special geologic features.

§ 296-22 Plan submission

A. For regulated activities specified in § **296-5D (1)** and **(2)**:

1. The drainage plan shall be submitted by the developer to the Township as part of

the preliminary plan submission for the subdivision or land development.

2. Five copies of the drainage plan shall be submitted.

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

   (a) One copy to the Township of South Whitehall Planning Commission.

   (b) Two copies to the Township Engineer.

   (c) Two copies to the Lehigh Valley Planning Commission, except for drainage plans involving less than 10,000 square feet of additional impervious cover.

4. Drainage plans involving more than 10,000 square feet of additional impervious cover shall be submitted by the developer (possibly through the Township) to the Lehigh Valley Planning Commission as part of the preliminary plan submission. The Lehigh Valley Planning Commission will conduct an advisory review of the drainage plan for consistency with the Little Lehigh Creek Watershed, Coplay Creek Watershed or the Jordan Creek Watershed Stormwater Management Plan. The LVPC will not review details of the erosion and sedimentation plan or the BMP operations and maintenance plan.

   a. Two copies of the drainage plan shall be submitted.

   b. The Lehigh Valley Planning Commission will provide written comments to the developer and the Township, within a time frame consistent with established procedures under the Municipalities Planning Code, as to whether the drainage plan has been found to be consistent with the stormwater management plan.

B. For regulated activities specified in § **296-5D (3)** and **(4)**, the drainage plan shall be submitted by the developer to the Township Director of Community Development, or his designee, as part of the building permit application.

C. For regulated activities specified in § **296-5D (5)**, **(6)**, and **(7)**:

   1. The drainage plan shall be submitted by the developer to the Lehigh Valley Planning Commission for coordination with the DEP permit application process under Chapter 105 (Dam Safety and Waterway Management) or Chapter 106 (Floodplain Management) of DEP's rules and regulations.

2. One copy of the drainage plan shall be submitted.

D. Earthmoving for all regulated activities under § **296-5D** shall be conducted in accordance with the current federal and state regulations relative to the NPDES and DEP Chapter 102 regulations.

§ 296-23 Drainage plan review

A. The Township Engineer shall review the drainage plan, including the BMP operations and maintenance plan, for consistency with the adopted stormwater management plan as embodied by this Chapter and with any permits issued by DEP. The Township Engineer shall also review the drainage plan against any additional storm drainage provisions contained in the Township Subdivision and Land Development, Chapter **312** or Chapter **350**, Zoning, as applicable.

B. The Township shall not approve any subdivision or land development [regulated activities § **296-5D (1)** and **(2)**] or building permit application [regulated activities § **296-5D (3)** and **(4)**] if the drainage plan has been found to be inconsistent with the stormwater management plan as determined by the Township Engineer.

C. The Township shall notify the applicant in writing whether the drainage plan, including the BMP operations and maintenance plan, is approved.

D. The Township may require an as-built survey of all stormwater BMPs and an explanation of any discrepancies with the drainage plan.

§ 296-24 Modifications of plans

A modification to a submitted drainage plan for a proposed development site which involves a change in control methods or techniques, or which involves the relocation or redesign of control measures, or which is necessary because soil or other conditions are not as stated on the drainage plan (as determined by the Township Engineer) shall require a resubmission of the modified drainage plan consistent with § **296-22** subject to review per § **296-23** of this chapter.

§ 296-25 Hardship waiver procedure

A. The Township may hear requests for waivers where it is alleged that the provisions of this Chapter inflict unnecessary hardship upon the applicant. The waiver request shall be in writing and accompanied by the requisite fee based upon a fee schedule adopted by the Township Board of Commissioners. A copy of the waiver request shall be provided to each of the following: Township Manager, Township Zoning Hearing Board, Township

Engineer, Director of Community Development, Township Solicitor and Lehigh Valley Planning Commission. The request shall fully document the nature of the alleged hardship.

B. The Township may grant a waiver, provided, that all of the following findings are made in a given case:

1. That there are unique physical circumstances or conditions, including irregularity of lot size or shape, or exceptional topographical or other physical conditions peculiar to the particular property, and that the unnecessary hardship is due to such conditions, and not the circumstances or conditions generally created by the provisions of this Chapter in the stormwater management district in which the property is located;

2. That because of such physical circumstances or conditions there is no possibility that the property can be developed in strict conformity with the provisions of this Chapter, including the no harm provision, and that the authorization of a waiver is therefore necessary to enable the reasonable use of the property;

3. That such unnecessary hardship has not been created by the applicant; and

4. That the waiver, if authorized, will represent the minimum waiver that will afford relief and will represent the least modification possible of the regulation in issue;

5. That financial hardship is not the criteria for granting of a hardship waiver.

C. In granting any waiver, the Township Board of Commissioners or Zoning Hearing Board may attach such reasonable conditions and safeguards as it may deem necessary to implement the purposes of article. Such conditions may include, but not be limited to (if recommended by the Township Engineer), a requirement that comparable detention be located by the applicant on lands other than those on which the waiver has been requested, to assure that the overall detention capability of a given subarea is not diminished and that the overall rate of runoff is not increased as a result of the waiver. If a hardship waiver is granted, the applicant must still manage the quantity, velocity quality and direction of resulting storm runoff as is reasonably necessary to prevent injury to health, safety or other property.

1. For regulated activities described in § **296-5D (1)** and **(2)**, the Township Board of Commissioners shall hear requests for and decide on hardship waiver requests on behalf of the Township.

2. For regulated activities in § **296-5D (3)**, **(4)**, **(5)** and **(6)**, the Zoning Hearing Board shall hear requests for and decide on hardship waiver requests on behalf of

the Township.

3. The Township shall not waive the water quality provisions of this Chapter.

Article V
INSPECTIONS

§ 296-26 Schedule of inspections

A. For each phase of development, the developer shall provide notification to the Township Engineer and the Township a minimum three days prior to the installation of the permanent stormwater control facilities so that general observation of the work can be scheduled. The developer shall furnish to the Township record drawings of the subject facilities (including detention basin grades) which are certified by a registered land surveyor. Full acceptance and approval of the stormwater management facilities will not occur until installation is observed to be acceptable and record plans are approved.

B. If at any stage of the work the Township Engineer determines that the permanent stormwater control facilities are not being installed in accordance with the approved development plan, the Township shall revoke any existing permits until a revised development plan is submitted and approved as required by § **296-~~21~~ 24**.

C. DEP or its designees (e.g., County Conservation District) normally ensure compliance with any permits issued, including those for stormwater management. In addition to DEP compliance programs, the Township or its designee may inspect all phases of the construction, operations, maintenance, and any other implementation of stormwater BMPs.

D. During any stage of the regulated earth disturbance activities, if the Township or its designee determines that any BMPs are not being implemented in accordance with this chapter, the Township may suspend or revoke any existing permits or other approvals issued by the Township until the deficiencies are corrected.

§296-27 Volume Controls

The green infrastructure and low impact development practices provided in the BMP Manual[4] shall be utilized for all regulated activities wherever possible. 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 one acre that do not require hydrologic routing to design the stormwater facilities, this Chapter establishes no preference for either methodology; therefore, the applicant may select either methodology on the basis of economic considerations, the intrinsic limitations on applicability of the analytical procedures associated with each methodology and other factors.

A. The *Design Storm Method* (CG-1 in the BMP Manual[4]) is applicable to any size of regulated activity. This method requires detailed modeling based on site conditions.

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

2. For modeling purposes:

   a. Existing (predevelopment) non-forested pervious areas must be considered meadow in good condition.

   b. (Enter a percentage no less than 20%, up to 100%.) of existing impervious area, when present, shall be considered meadow in good condition in the model for existing conditions.

B. The *Simplified Method* (CG-2 in the BMP Manual[4]) 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 one acre or for projects that require design of stormwater storage facilities. For new impervious surfaces:

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

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

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

4. This method is exempt from the requirements of **§296-28, Rate Controls.**

§296-28 Rate Controls

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

Post-development discharge rates shall not exceed the pre-development discharge rates for the 1-, 2-, 5-, 10-, 25-, 50-, and 100-year, 24-hour storm events. 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 pre-development 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.

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

For the 1-, 2-, 5-, 10-, 25-, 50-, and 100-year, 24-hour storm events, the post-development peak discharge rates will follow the applicable approved release rate maps. For any areas not shown on the release rate maps, the post-development discharge rates shall not exceed the pre-development discharge rates.

§296-29 Riparian Buffers

A. In order to protect and improve water quality, a Riparian Buffer Easement shall be created and recorded as of any subdivision or land development that encompasses a Riparian Buffer.

B. Except as required by Chapter 102, the Riparian Buffer Easement shall be measured to be the greater of the 100-year floodplain or a minimum of 35 feet from the top of the streambank (on each side).

C. Minimum Management Requirements for Riparian Buffers.

1. Existing native vegetation shall be protected and maintained within the Riparian Buffer Easement.

2. Whenever practicable invasive vegetation shall be actively removed, and the Riparian Buffer Easement shall be planted with native trees, shrubs, and other vegetation to create a diverse native plant community appropriate to the intended ecological context of the site.

D. The riparian buffer easement shall be enforceable by the Township and shall be recorded in the appropriate County Recorder of Deeds Office, so that it shall run with the land and shall limit the use of the property located therein. The easement shall allow for the continued private ownership and shall count toward the minimum lot area required by Zoning, unless otherwise specified in the Township Zoning Ordinance.

E. Any permitted use within the riparian buffer easement shall be conducted in a manner that will maintain the extent of the existing 100-year floodplain, improve or maintain the stream stability, and preserve and protect the ecological function of the floodplain.

F. The following conditions shall apply when public and/or private recreation trails are permitted within riparian buffers:

1. Trails shall be for nonmotorized use only.

2. Trails shall be designed to have the least impact on native plant species and other sensitive environmental features.

G. Septic drainfields and sewage disposal systems shall not be permitted within the riparian buffer easement and shall comply with setback requirements established under 25 Pa. Code Chapter 73

ARTICLE VI
STORMWATER MANAGEMENT (SWM) SITE PLAN REQUIREMENTS

§296-30 Plan Requirements

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

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

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

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

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

1. The overall stormwater management concept for the project.

2. A determination of site conditions in accordance with the BMP Manual[4]. A detailed site evaluation shall be completed for projects proposed in areas of carbonate geology or karst topography, and other environmentally sensitive areas, such as brownfields.

3. Stormwater runoff design computations and documentation as specified in this Chapter, or as otherwise necessary to demonstrate that the maximum practicable measures have been taken to meet the requirements of this Chapter, including the recommendations and general requirements in **§ 296-11**.

4. Expected project time schedule.

5. A soil erosion and sediment control plan, where applicable, as prepared for and submitted to the approval authority.

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

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

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

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

10. A Justification must be included in the SWM Site Plan if BMPs other than green infrastructure methods and LID practices are proposed to achieve the volume, rate, and water quality controls required under this Chapter, the Township will not approve the SWM Site Plan unless it determines that green infrastructure and LID practices are not practicable.

§296-31 Plan Submission

A. The SWM Site Plan shall be submitted by the developer to the Township as part of the preliminary plan submission for the subdivision or land development.

B. Five copies of the SWM Site Plan shall be submitted as follows for regulated activities specified in **§296-5D (1) and (2):**

1. One copy to the Township of South Whitehall Planning Commission.

2. Two copies to the Township engineer (when applicable).

3. One copy to the Lehigh County Conservation District.

4. Two copies to the Lehigh County Planning Commission, except for SWM Site Plans involving less than 10,000 square feet of additional impervious cover.

C. SWM Site Plans involving more than 10,000 square feet of additional impervious cover shall be submitted by the developer (possibly through the Township) to the Lehigh Valley Planning Commission as part of the preliminary plan submission. The Lehigh Valley Planning Commission will conduct an advisory review of the SWM Site Plan for consistency with the Little Lehigh Creek Watershed, Coplay Creek Watershed, or the Jordan Creek Watershed Stormwater Management Plan. The LVPC will not review details of the erosion and sedimentation plan or the BMP operations and maintenance plan.

1. Two copies of SWM Site Plan shall be submitted.

2. The Lehigh Valley Planning Commission will provide written comments to the developer and the Township, within a time frame consistent with established procedures under the Municipalities Planning Code, as to whether the SWM Site Plan has been found to be consistent with the stormwater management plan.

D. For regulated activities specified in §296-5D (3) and (4), the SWM Site Plan shall be submitted by the developer to the Township as part of the building permit process.

E. For regulated activities specified in §296-5D (5), (6), and (7):

1. The SWM Site Plan shall be submitted by the developer to the Lehigh Valley Planning Commission for coordination with the DEP permit application process under Chapter 105 (Dam Safety and Waterway Management) or Chapter 106 (Floodplain Management) of DEP's rules and regulations.

2. One copy of SWM Site Plan shall be submitted.

F. Earthmoving for all regulated activities under **§296-5D** shall be conducted in accordance with the current Federal and State regulations relative to the NPDES and DEP Chapter 102 regulations.

§296-32 Plan Review

A. SWM Site Plans, including the BMP operations and maintenance plans shall be reviewed by the Township Engineer for consistency with the provisions of this Chapter and any permits issued by DEP. The Township Engineer shall also review the SWM Site Plan against any additional storm drainage provisions contained in the Township Subdivision and Land Development, Chapter 312 and Chapter 350, Zoning, as applicable.

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

C. For any SWM Site Plan that proposes to use any BMPs other than the green infrastructure and LID practices to achieve the volume and rate controls required under this Chapter, The Township will not approve the Site Plan unless it determines that green infrastructure and LID practices are not required.

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

E. The Township may require an as-built survey of all stormwater BMPs and an explanation of any discrepancies with the drainage plan.

§296-33 Modification of Plans

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

§296-34 Resubmission of Disapproved SWM Site Plans

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

§296-35 Authorization to Construct and Term of Validity

The Township's approval of an SWM Site Plan authorizes the regulated activities contained in the SWM Site Plan for a maximum term of validity of 5 years following the date of approval. The Township may specify a term of validity shorter than 5 years in the approval for any specific SWM Site Plan. Terms of validity shall commence on the date the Township signs the approval for an SWM Site Plan. If an approved SWM Site Plan is not completed according to **§296-35** within the term of validity, then the Township may consider the SWM Site Plan disapproved and may revoke any and all permits. SWM Site Plans that are considered disapproved by the Municipality shall be resubmitted in accordance with **§296-34** of this Chapter.

§296-36 As-Built Plans, Completion Certificate, and Final Inspection

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

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

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

Article VII
STORMWATER BMP OPERATIONS AND MAINTENANCE PLAN GENERAL REQUIREMENTS

§ 296-37 General requirements

No regulated earth disturbance activities within the Township shall commence until approval by the Township of the BMP operations and maintenance plan which describes how the permanent (e.g., post-construction) stormwater BMPs will be properly operated and maintained.

§ 296-38 Responsibilities for operations and maintenance of BMPs

A. BMP operations and maintenance plan for the project site shall establish responsibilities for the continuing operation and maintenance of all permanent 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 Township, stormwater BMPs may also be dedicated to and maintained by the Township.

   2. 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.

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

§ 296-39 Adherence to approved BMP operations and maintenance plan

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 Township.

§ 296-40 Operations and maintenance agreement for privately owned stormwater BMPs

A. The property owner shall sign an operations and maintenance agreement with the Township covering all stormwater BMPs that are to be privately owned. The agreement shall include the terms of the format agreement referenced in Appendix E of this Chapter.

B. Other terms may be included in the agreement where determined by the Township to be reasonable or 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 Township.

§ 296-41 Stormwater management easements

Stormwater management easements shall be provided by the property owner if necessary for access for inspections and maintenance or for preservation of stormwater conveyance, infiltration, detention areas and other BMPs by persons other than the property owner. The purpose of the easement shall be specified in any agreement under § **296-~~30~~ 40**.

§ 296-42 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 implements, as descried in the BMP operations and maintenance plan, shall record the following documents in the Office of the Recorder of Deeds for Lehigh County, within 90 days of approval of the BMP operations plan by the Township:

   1. Operations and maintenance plan or a summary thereof.

   2. Operations and Maintenance Agreements under § **296-40**.

   3. Easements under § **296-41**.

B. The Township may suspend or revoke any approvals granted for the project site upon discovery of the failure of the owner to comply with this section.

§ 296-43 Township stormwater BMP Operation and Maintenance Fund

A. If stormwater BMPs are accepted by the Township for dedication, the Township may require persons installing stormwater BMPs to pay a specified amount to the Township 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 Township, the amount shall cover the estimated costs for operation and maintenance in perpetuity, as determined by the Township.

   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 Township may adjust the amount due accordingly.

ARTICLE VIII
OPERATIONS and MAINTENANCE

§296-44 Responsibilities of Developers and Landowners

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

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

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

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

§296-45 Operation and Maintenance Agreements

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

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

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

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 shall be submitted by the owner to the Township within ten (10) working days of the change.

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

§296-46 Performance Guarantee

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

§296-47 Performance Inspections

The landowner or the owner's designee (including the Township for dedicated and owned facilities) shall inspect SWM BMPs, facilities and/or structures installed under this Chapter according to the following frequencies, at a minimum, to ensure the BMPs, facilities and/or structures continue to function as intended:

1. Annually for the first 5 years.

2. Once every 3 years thereafter.

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

Inspections should be conducted during or immediately following precipitation events. A written inspection report shall be created to document each inspection. The inspection report shall contain the date and time of the inspection, the individual(s) who completed the inspection, the location of the BMP, facility or structure inspected, observations on performance, and recommendations for improving performance, if applicable. Inspection reports shall be submitted to the Township within 30 days following completion of the inspection.

Article IX
MAINTENANCE RESPONSIBILITIES FOR PERMANENT STORMWATER RUNOFF CONTROLS

§ 296-48 Maintenance responsibilities

The maintenance responsibilities for permanent stormwater runoff control facilities shall be determined based upon the type of ownership of the property which is controlled by the facilities.

A. Single entity ownership. In all cases where the permanent stormwater runoff control facilities are designed to manage runoff from property in a single entity ownership as defined below, the maintenance responsibility for the stormwater control facilities shall be with the single entity owner. The single entity owner shall enter into an agreement with the Township which specifies that the owner will properly maintain the facilities consistent with accepted practice as determined by the Township Engineer. The agreement shall provide for regular inspections by the Township, shall contain such provisions as are necessary to ensure timely correction of any maintenance deficiencies by the single entity owner, and shall be recorded in the miscellaneous docket in the Office of the Recorder of Deeds of Lehigh County, Pennsylvania. For the purposes of this chapter, the term "single entity" shall be defined as an individual, association, public or private corporation, partnership firm, trust, estate or any other legal entity empowered to own real estate.

B. Multiple ownership. In cases where the property controlled by the permanent stormwater control facilities shall be in multiple ownership (i.e., many individual owners of various portions of the property), the developer shall dedicate the permanent stormwater control facilities to the Township for maintenance unless, in the opinion of the Board of

Commissioners, another ownership and maintenance alternative, as permitted in Subsection **C**, below, will better serve the public interest. The developer shall pay a fee to the Township corresponding to the present worth of maintenance of the facilities in perpetuity. The estimated annual maintenance cost for the facilities shall be based on a fee schedule provided by the Township Engineer and adopted by the Township Board of Commissioners. The fee schedule must be reasonable.

C. In certain multiple ownership situations, the public may benefit should the Township require that maintenance responsibilities be borne by an individual or other legal entity. In these instances, the Township and the responsible individual or entity shall, at the Township's opinion, enter into a formal agreement regarding such maintenance obligation.

Article X
Fees and Expenses

§ 296-49 General

A fee shall be established by the Township Board of Commissioners to defray all Township costs incurred in the review fee charged to an applicant. The review fee may include, but not limited to, costs for the following:

1. Administrative/clerical processing costs.
2. Review of the drainage plan and the SWM operations and maintenance plan by the Township Engineer.
3. Attendance at meetings.
4. The site inspection
5. The inspection of required controls and improvements during construction.
6. The final inspection upon completion of the controls and improvements required by the plan.
7. Any additional work required to enforce any permit provisions regulated by this Chapter, correct violations and assure the completion of stipulated remedial actions.

Article XI
Prohibitions

§ 296-50 Prohibited discharges and connections

A. Any drain or conveyance, whether on the surface or subsurface, that allows any non-stormwater discharge including sewage, process wastewater, and wash water to enter a regulated small MS4 or to enter the surface waters of this Commonwealth is prohibited.

B. No person shall allow, or cause to allow, discharges into a regulated small MS4, or discharges into waters of this Commonwealth, which are not composed entirely of stormwater, except (1) as provided in paragraph C below and (2) discharges authorized under a state or federal permit.

C. The following discharges are authorized unless they are determined to be significant contributors to pollution of a regulated small MS4 or to the waters of this Commonwealth:

1. Discharges or flows from firefighting activities.

2. Discharges from potable water sources including water line flushing, and fire hydrant flushing, if such discharges do not contain detectable concentrations of Total Residual Chlorine (TRC).

3. Non-contaminated irrigation water, water from lawn maintenance, landscape drainage and flows from riparian habitats and wetlands.

4. Diverted stream flows and springs.

5. Non-contaminated pumped ground water and water from foundation and footing drains and crawl space pumps.

6. Non-contaminated HVAC condensation and water from geothermal systems.

7. Residential (i.e., not commercial) vehicle wash water where cleaning agents are not utilized.

8. Non-contaminated hydrostatic test water discharges if such discharges do not contain detectable concentrations of TRC.

9. Routine external building wash down which does not use detergents or other compounds.

10. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spill material has been removed) and where detergents are not used.

11. Dechlorinated swimming pool discharges.

D. In the event that the Township or DEP determines that any of the discharges identified in Subsection **C** significantly contribute Pollutants to a regulated small MS4 or to the waters of this Commonwealth, the Township or DEP will notify the responsible person(s) to cease discharge.

E. Upon notice provided by the Township under Subsection D, the discharger will have a reasonable time, as determined by the Township, to cease the discharge consistent with the degree of pollution caused by the discharge.

F. Nothing in this section shall affect a discharger's responsibilities under State law.

G. The following notes should be added to each plan to be recorded:

Township MS4 Permit

1. In consultation with Township staff and the Lehigh County Conservation District regarding requirements related to BMP monitoring and the Township's MS4 permit, we request the following BMP Maintenance Responsibility statements be provided on the plans to be recorded above a comprehensive list of all BMPs by location required as part of the project's NPDES Permit:

   a. Upon construction of BMP(s), the contractor should provide as-built survey information to the Township;

   b. An annual report shall be submitted by the NPDES Permittee to the Township Public Works Department each March 1ST stating that the operation and maintenance have been performed for each BMP listed below upon its installation;

   c. The PCSM Plan, BMP inspection reports, and BMP monitoring records shall be made available by the NPDES Permittee for review by PADEP, LCCD, and the Township upon request;

   d. The NPDES Permittee is responsible for the operation and maintenance, annual report to the Township, record keeping of monitoring the listed BMPs until NPDES Permit termination; and

   e. Access to the site via Agreement and/or Easements satisfactory to the Township shall be provided for municipal stormwater inspection and maintenance.

§ 296-51 Prohibited connections

The following connections are prohibited, except as provided in § **296-50C** above:

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

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

§ 296-52 Roof drains and sump pumps

A. Roof drains and sump pumps shall discharge to infiltration area or vegetative BMPs to

the maximum extent wherever feasible.

B. Roof drains shall not be connected to streets, sanitary or storm sewers or roadside ditches, except as provide in Subsection **C.**

C. When it is more advantageous to connect directly to streets or storm sewers, connections of roof drains to streets or roadside ditches may be permitted by the Township.

§ 296-53 Alteration of SWM BMPs

A. No person shall modify, remove, fill, landscape or alter any SWM BMP, facilities, areas, or structures that were installed as a requirement of this Chapter without the written approval of the Township, unless it is part of an approved maintenance program.

B. No person shall place any structure, fill, landscaping, or vegetation into a stormwater SWM BMP or within a drainage easement, which would limit or alter the functioning of the BMP, without the written approval of the Township.

Article XII
ENFORCEMENT AND PENALTIES

§ 296-54 Right-of-entry

A. Upon presentation of proper credentials, the Township, or its designated agent with the consent of the landowner, may enter at reasonable times upon any property within the Township to inspect the implementation, condition or operation and maintenance of the stormwater structures and facilities or to investigate or ascertain the condition of the subject property in regard to any aspect regulated by this Chapter.

B. In the event that the landowner refuses admission to the property, duly authorized representatives of the Township may seek an administrative search warrant issued by a Magisterial District Judge to gain access to the property.

§ 296-55 Notification

A. Whenever the Township finds that a person has violated a prohibition or failed to meet a requirement of this Chapter, the Township may order compliance by written notice to the responsible person. Such notice may require without limitation:

1. The name of the owner of record and any other person against whom the Township intends to take action.

2. The location of the property in violation.

3. The performance of monitoring, analyses, and reporting.

4. The elimination of prohibited connections or discharges.

5. Cessation of any violating discharges, practices or operations.

6. The abatement or remediation of stormwater pollution or contamination hazards and the restoration of any affected property.

7. Payment of a fine to cover administrative and remediation costs.

8. The implementation of stormwater BMPs.

9. 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 the violation(s). Said notice may further advise that should the violator fail to take the required action within the established deadline, the work will be done by the Township or designee and the expense thereof, together with all related lien and enforcement fees, charges, and expenses, shall be charged to the violator.

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

§ 296-56 Public nuisance

A. The violation of any provision of this Chapter is hereby deemed a Public Nuisance.

B. Each day that an offense continues shall constitute a separate violation.

§ 296-57 Enforcement

A. It shall be unlawful for a person to undertake any regulated activity except as provided in an approved SWM Site Plan, unless specifically exempted in **§296-12.**

B. It shall be unlawful to violate **§296-53** of this Chapter.

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

§ 296-58 Suspension and revocation of permits and approvals

A. Any approval or permit issued by the Township pursuant to this Chapter may be suspended

or revoked for:

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

2. A violation of any provision of this Chapter or any other applicable law, ordinance, rule, or regulation related to Regulated Activity.

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

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

1. The Township or designee has inspected and approved the corrections to the violations that caused the suspension.

2. The Township is satisfied that the violation of the ordinance, law or rule and regulations has been corrected.

3. Payment of all Township fees, costs and expenses related to or arising from the violation have been satisfied.

C. A permit or approval that has been revoked by the Township cannot be reinstated. The applicant may apply for a new permit or approval under the provisions of this Chapter.

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

§ 296-59 Penalties

A. Any person, partnership or corporation violating the provisions of this Chapter shall be guilty of a summary offense, and upon conviction shall be subject to a fine of not more than $1,000 for each violation, recoverable with costs, or imprisonment of not more than 30 days, or both. Each day that a violation continues shall be a separate offense and penalties shall be cumulative.

B. In addition, the Township may institute injunctive, mandamus, or any other appropriate

action or proceeding at law or in equity for the enforcement of this Chapter. Any court of competent jurisdiction shall have the right to issue restraining orders, temporary or permanent injunctions, mandamus, or other appropriate forms of remedy or relief.

§ 296-60 Appeals

A. Any person aggrieved by any action of the Township or its designee, relevant to the provisions of this Chapter, may appeal to the Township within 30 days of that action by using the appeal procedures established in the Pennsylvania Municipalities Planning Code.

B. Any person aggrieved by any decision of the Township, relevant to the provisions of this Chapter, may appeal to the Lehigh County Court of Common Pleas within 30 days of the Township's decision.

ARTICLE XIII
REFERENCES

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

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

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

4. Pennsylvania Department of Environmental Protection. No. 363-2134-008 (March 31, 2012), as amended and updated. *Erosion and Sediment Pollution Control Program Manual.* Harrisburg, PA.

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

SECTION 2. SEVERABILITY

If any sentence, clause, section, term, phrase or part of this Ordinance is for any reason found to be unconstitutional, illegal or invalid, such unconstitutionality, illegality or invalidity shall not affect or impair any of the remaining provisions, sentences, clauses, sections, terms, provisions, or parts of this Ordinance. It is hereby declared the intent of the Board of Commissioners of

South Whitehall Township that this Ordinance would have been adopted had such an unconstitutional, illegal, or invalid sentence, clause, section, or part thereof not been included herein.

SECTION 3. FAILURE TO ENFORCE NOT A WAIVER

The failure of the Township to enforce any provision of this Ordinance shall not constitute a waiver by the Township of its rights of future enforcement hereunder.

SECTION 4. REPEALER

Any ordinance, resolution and/or other regulation of the Township, or any parts of ordinances, resolutions and/or other regulations of the Township, including but not limited to all prior zoning ordinances and amendments or parts of prior zoning ordinances and amendments, including prior zoning maps, which are inconsistent herewith are hereby repealed. All other provisions of the ordinances, resolutions and/or other regulations of the Township of South Whitehall, Lehigh County, Pennsylvania shall remain in full force and effect.

SECTION 5. EFFECTIVE DATE

This Ordinance shall become effective immediately following the date of adoption by the Board of Commissioners.

DULY ENACTED AND ORDAINED as an Ordinance this _____ day of _____, 2022 by a majority of the Board of Commissioners of South Whitehall Township, Lehigh County, Pennsylvania, at a duly advertised meeting of the Board of Commissioners at which a quorum was present. As part of this Ordinance, the Board of Commissioners has directed that the President, or Vice-President in the absence of the President, execute this Ordinance on behalf of the Board.

TOWNSHIP OF SOUTH WHITEHALL
BOARD OF COMMISSIONERS

_____
Diane Kelly, President

ATTEST:

_____
Scott Boehret, Secretary

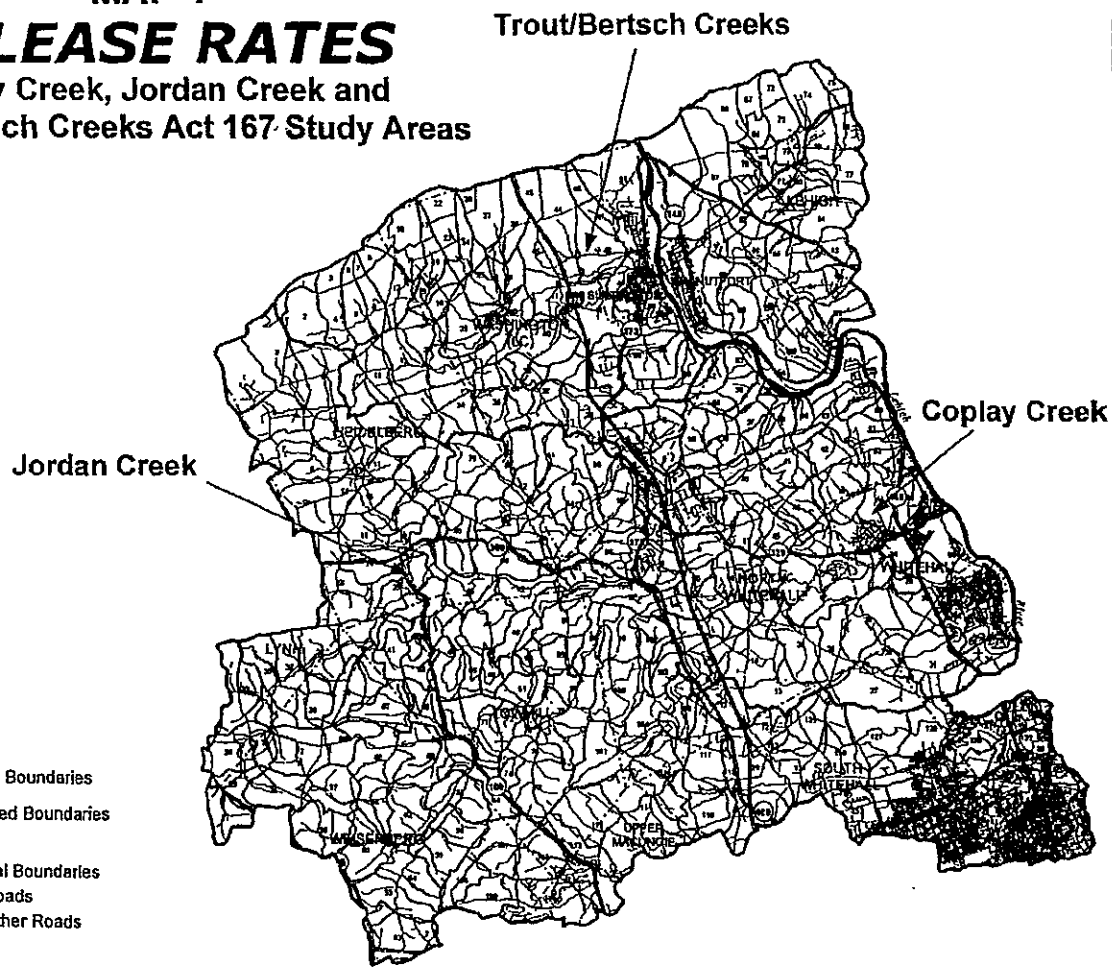
APPENDIX A

Maps of Jordan Creek, Coplay Creek and Little Lehigh Creek Watersheds

MAP 4

RELEASE RATES

Coplay Creek, Jordan Creek and Trout/Bertsch Creeks Act 167 Study Areas



23 Subarea Boundaries

Watershed Boundaries

Municipal Boundaries

Major Roads

Minor/Other Roads

River

Streams

RELEASE RATE SUMMARY TABLES

Dual Release Rate Categories (30/–) define a 30% Release Rate for the 2-Year storm and the indicated Release Rate for the 10-, 25- and 100-Year storms.

COPLAY CREEK STUDY AREA

Subarea	Release Rate (%)	Subarea	Release Rate (%)
1 - 11	30/100	35	30/100
12 - 15	30/50	36 – 38	30/CND I*
16 - 19	30/100	39 – 40	30/100
20 - 21	30/90	41 – 44	30/CND I*
22	30/100	45	30/100
23 - 26	30/CND I*	46 – 50	30/CND I*
27	30/100	51 – 53	30/CND II*
28	30/90	54	30/100
29	30/100	55	30/CND I*
30 - 34	30/CND I*	56 – 85	30/CND II*

JORDAN CREEK STUDY AREA

Subarea	Release Rate (%)	Subarea	Release Rate (%)
1 - 85	30/100	118	30/100
86	30/PND*	119 - 120	30/PND*
87	30/100	121 - 122	30/100
88 - 101	30/PND*	123 - 131	30/PND*
102	30/100	132	30/100
103 - 105	30/PND*	133	30/PND*
106 - 113	30/100	134 - 135	30/100
114 - 115	30/PND*	136	30/PND*
116	30/100	137 - 138	30/100
117	30/PND*	139 - 145	30/PND*

TROUT/BERTSCH CREEKS STUDY AREA

Subarea	Release Rate (%)	Subarea	Release Rate (%)
1 - 20	30/100	53	30/100
21	30/CND I*	54 - 55	30/CND I*
22 - 29	30/100	56 - 58	30/CND II*
30 - 32	30/CND I*	59 - 60	30/100
33 - 37	30/100	61 - 62	30/CND II*
38 - 42	30/CND I*	63 - 84	30/100
43 - 44	30/100	85	30/CND I*
45	30/90	86 - 81	30/100
46 - 48	30/100	82	30/CND I*
49 - 50	30/CND I*	83 - 84	30/100
51 - 52	30/CND II*	85 - 89	30/CND I*

*Conditional/Provisional No Detention Areas do not need detention controls for the 10-, 25- or 100-Year storms, provided that adequate downstream capacity can be shown for increased peak flows. (See Plan Update for additional details.)

N

0 10,000 20,000 Feet

1" = 10,000'

Source: Lehigh Valley Planning Commission

LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9368
(610) 264-4544

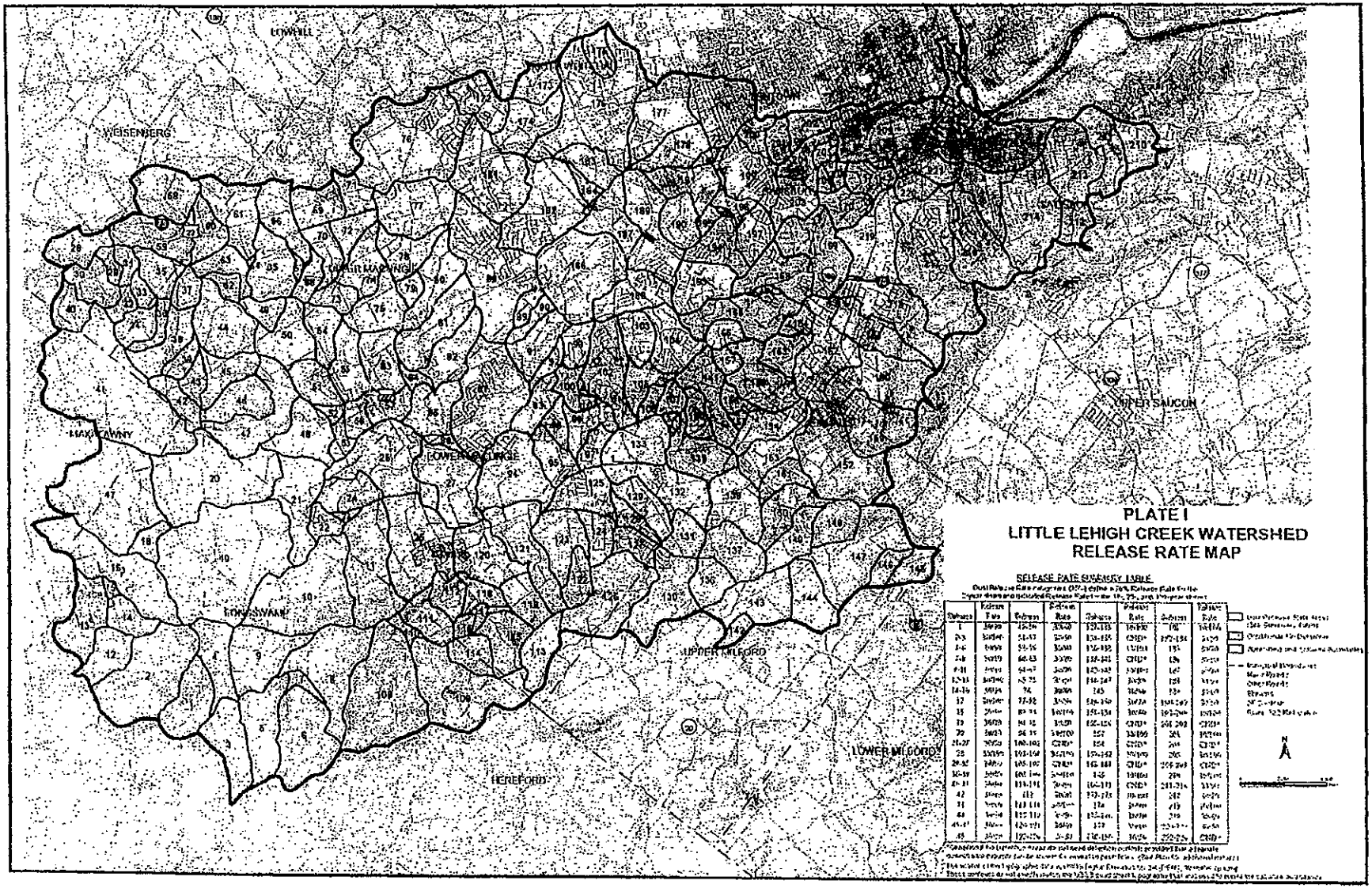


PLATE I
LITTLE LEHIGH CREEK WATERSHED
RELEASE RATE MAP

RELEASE RATE SUMMARY TABLE

APPENDIX B

B-1 Maps and Descriptions of Storm Drainage Problem Areas for Coplay Creek

B-2 Maps and Descriptions of Storm Drainage Problem Areas for Jordan Creek

B-3 Maps and Descriptions of Storm Drainage Problem Areas for Little Lehigh Creek

CHAPTER V. COPLAY CREEK STUDY AREA EXISTING STORM DRAINAGE PROBLEM AREAS AND SIGNIFICANT OBSTRUCTIONS

A. Existing Storm Drainage Problem Areas

An important goal of Act 167 is to prevent any existing storm drainage problem areas from getting worse. The first step toward that goal is to identify the existing problem areas. Each municipality in the Coplay Creek Study Area was provided with an opportunity to document the existing drainage problems within its borders. The starting point for the drainage problem inventory was the JPC Regional Storm Drainage Plan (RSDP) which documented no problems throughout the study area based on a municipal survey conducted prior to 1975. This process resulted in the documentation of twenty-one (21) existing drainage problems in the study area. The type of problem identified was typically street and/or property flooding. Figure 8 is a map of the Coplay Creek Study Area indicating the storm drainage problem areas as identified as part of the Storm Water Management Plan. The problem areas on Figure 8 are number coded and keyed to the problem area descriptions presented in Table 11. The "Subarea" and "Reach No." columns in Table 11 refer to the location of the problem areas relative to the study area breakdown for modeling purposes. A subarea is the finest unit of breakdown of a watershed for which runoff values have been calculated. A reach is the swale, channel or stream segment which drains a particular subarea. Note that eleven (11) of the drainage problems are on an identified reach indicating that peak runoff values are readily available from the modeling process for this problem area. This runoff value could be used as input for design of remedial measures.

The final column in Table 11 lists generalized proposed solutions to the identified storm drainage problem areas. These generalized solutions have been provided by municipal representatives whether as part of the original problem area documentation or subsequent discussions. Proposed solutions listed include specific proposals based upon municipal studies of the problem areas, where available, and solutions which are readily apparent to the municipal representatives for the less complicated problem areas. For certain other problem areas, the solutions are not quite so apparent and may require detailed engineering evaluations to determine the most cost-effective solution. No solutions to these problem areas are available and are listed as "None proposed" in Table 11.

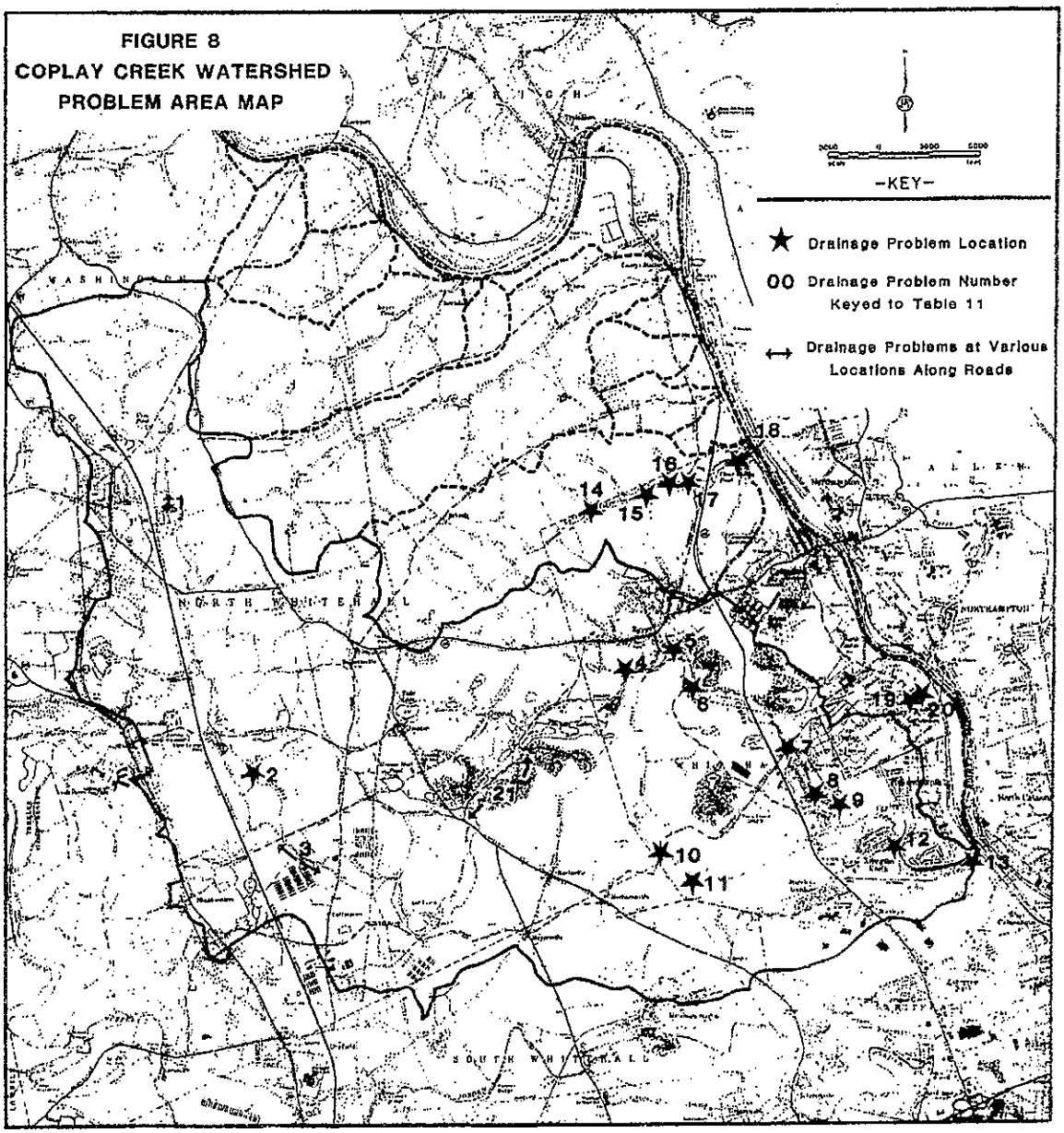


FIGURE 8
COPLAY CREEK WATERSHED
PROBLEM AREA MAP
-KEY-
Drainage Problem Location
00 Drainage Problem Number Keyed to Table 11
Drainage Problems at Various Locations Along Roads
NORTH WHITEHALL
SOUTH WHITEHALL
1
2
3
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21

V-2

TABLE 11

COPLAY CREEK STUDY AREA
STORM DRAINAGE PROBLEM AREAS

No.	Location	Municipality	Problem Description	Subarea No.	Reach No.	Proposed Solution
1	Neffs Valley Park	North Whitehall Twp.	Stream and property flooding	7	6	None proposed
2	Wood Street	North Whitehall Twp.	Street flooding	11,12	--	None proposed
3	Coplay Creek Rd. between Coffeetown Rd. and Levans Rd.	North Whitehall Twp.	Street and property flooding	13,14	12,13	None proposed
4	Reliance Street	Whitehall Twp.	Street and property flooding	22,23	--	Replace bridge
5	South Church Street (SR 1023)	Whitehall Twp.	Street and property flooding	24	23	Replace bridge
6	Chestnut Street	Whitehall Twp.	Street and property flooding	24,25	--	Replace bridge
7	Columbia Street	Whitehall Twp.	Street and property/building flooding	26	25	Replace bridge
8	Center Street and South Fifth Avenue	Whitehall Twp.	Street and property flooding	32	--	Upgrade existing storm sewer
9	South Fifth Avenue Dead End at Barkley Village Apartments	Whitehall Twp.	Street and property/building flooding	32	--	Upgrade existing storm sewer

TABLE 11 (cont'd)

COPLAY CREEK STUDY AREA
STORM DRAINAGE PROBLEM AREAS

No.	Location	Municipality	Problem Description	Subarea No.	Reach No.	Proposed Solution
10	Columbia Street	Whitehall Twp.	Street and property flooding	30	29	Culvert & channel improvements
11	Ringer Road	Whitehall Twp.	Street and property flooding	30	29	Culvert & channel improvements
12	Lehigh Street (SR 1014)	Whitehall Twp.	Street and property/building flooding	33,34	--	Replace bridge
13	Water Street and Eberhart Rd.	Whitehall Twp.	Street and building flooding	34	33	Replace bridge
14	Peach Bottom Road	Whitehall Twp.	Street flooding	47	46	Culvert improvements
15	Overlook Lane	Whitehall Twp.	Street flooding	48	47	Culvert improvements
16	Robin Street	Whitehall Twp.	Street and property flooding	48	47	Culvert improvements
17	Roosevelt Street	Whitehall Twp.	Street and property/building flooding	48	47	Culvert improvements
18	Northampton Borough Municipal Authority Spring Creek Reservoir Dam	Whitehall Twp.	Flooding over dam embankment	49,50	--	Spllway improvements

TABLE 11 (cont'd)

COPLAY CREEK STUDY AREA
STORM DRAINAGE PROBLEM AREAS

No.	Location	Municipality	Problem Description	Subarea No.	Reach No.	Proposed Solution
19	North 2nd Street	Borough of Coplay	Property flooding	65	--	None proposed
20	Center Street and Front Street	Borough of Coplay	Property flooding	65	--	None proposed
21	Quarry Street	North Whitehall Twp.	Street flooding	20, 21	19, 20	Remove debris in channel

B. Significant Obstructions

An obstruction in a watercourse can be defined borrowing from Chapter 105 of DER's Rules and Regulations as follows:

> "Any dike, bridge, culvert, wall, wingwall, fill, pier, wharf, embankment, abutment or other structure located in, along, or across or projecting into any ... channel or conveyance of surface water having defined bed and banks, whether natural or artificial, with perennial or intermittent flow."

Using the above-definition, one hundred and fifty-seven (157) obstructions have been identified and measured within the Coplay Creek Study Area. For each of these, an estimated flow capacity has been calculated. For the purposes of Act 167, it is necessary to refine the list of obstructions to include only those obstructions which are "significant" on a watershed basis. For the Coplay Creek Watershed and Lehigh River Sub-basin 2 Storm Water Management Plan, the following distinction has been used:

> An obstruction in a stream or channel shall be deemed "significant" if it has an estimated flow capacity which is less than the 10-year return period peak flow from the calibrated hydrologic model of a watershed prepared as part of the Act 167 Plan.

Using the refined definition, ninety-six (96) significant obstructions have been identified within the Coplay Creek Study Area and are shown in Figure 9. A list of the significant obstructions is presented in Table 12 which indicates the obstruction number, description, municipality and approximate flow capacity. Obstruction capacities have been estimated based on their upstream geometry as measured and bed slope and roughness factors (where applicable) consistent with the calibrated Penn State Runoff Models for the Coplay Creek, Rockdale Creek, Fells Creek and Spring Creek Watersheds and the watershed associated with the unnamed creek just north of the Rockdale Creek. The estimates reflect reasonable flow capacities of the obstructions for "open channel" flow conditions (i.e. where the obstructions are not submerged). These estimated capacities are for illustration only and shall not be used as absolute capacities for storm water management decisions. The capacity of any obstruction when used to meet the requirements of this Plan shall be based upon a detailed hydraulic investigation including possible headwater and tailwater conditions, obstruction configuration

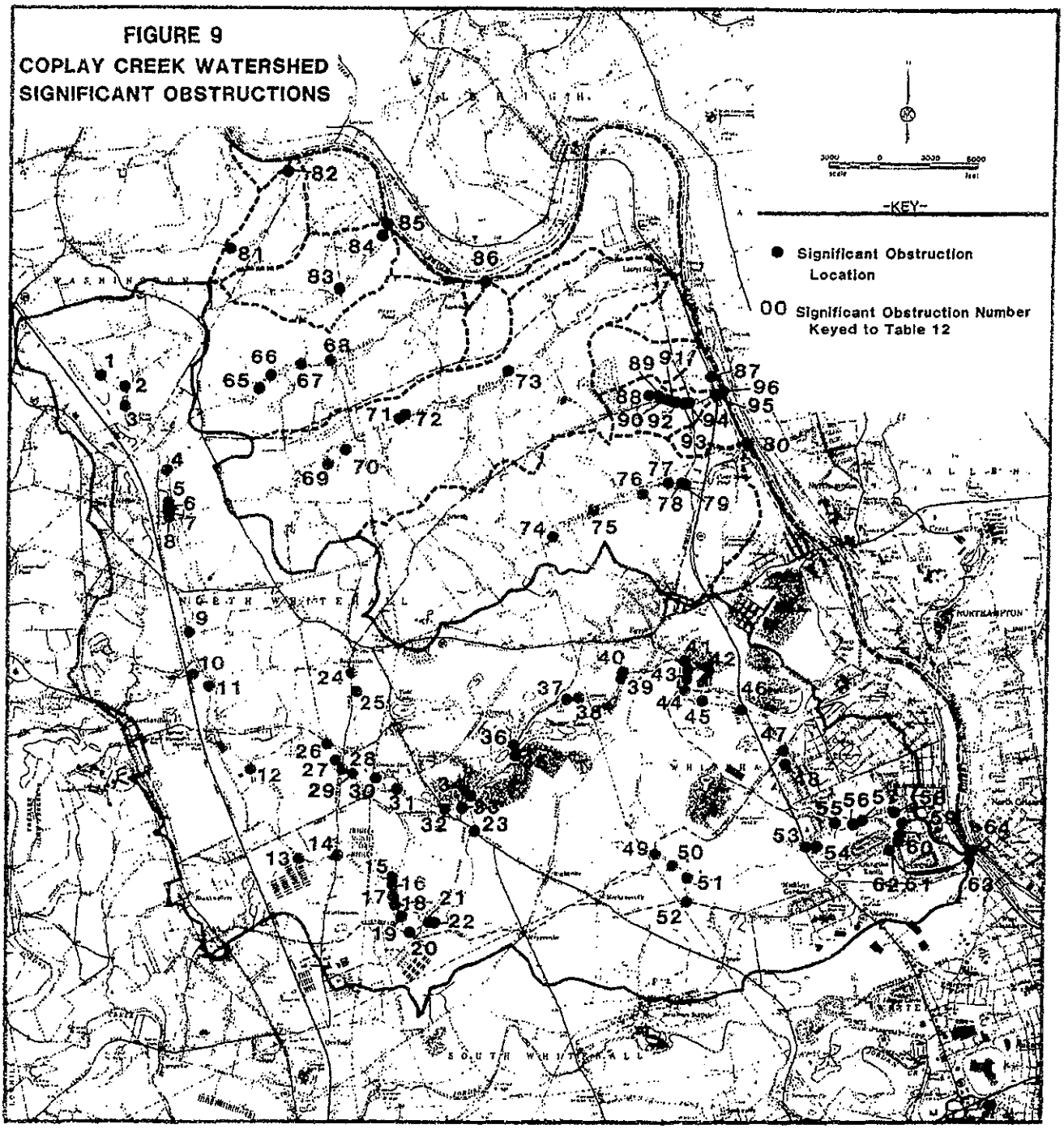


FIGURE 9
COPLAY CREEK WATERSHED
SIGNIFICANT OBSTRUCTIONS
-KEY-
Significant Obstruction Location
00 Significant Obstruction Number Keyed to Table 12

(abutments, wingwalls, piers, etc.) field measured slopes and other conditions as may affect capacity for design flows.

There are thirteen (13) identified significant obstructions which coincide with documented storm drainage problem areas as indicated in Table 12. Each obstruction which coincides with a drainage problem area is footnoted in Table 12 with the corresponding problem area number identified at the end of the table. The importance of the identified significant obstructions and problem areas as part of the development of a runoff control strategy is discussed in Chapter VIII.

TABLE 12

COPLAY CREEK STUDY AREA SIGNIFICANT OBSTRUCTIONS

Number*	Obstruction	Municipality	Approximate Flow Capacity (cfs)**
1	Hickory Road	Washington Twp.	43
2	Hickory Road	"	49
3	Creek Road	"	201
4	Park Circle	N. Whitehall Twp.	119
5	Neffs Valley Park Bridge[1]	"	164
6	Neffs Valley Park Bridge[1]	"	389
7	Neffs Valley Park Bridge[1]	"	267
8	Neffs Valley Park Bridge[1]	"	351
9	Excelsior Road	"	414
10	Private Driveway	"	151
11	Concrete Dam (Private)	"	187
12	Wood Street[2]	"	391
13	Coffeetown Road[3]	"	25
14	Meyersville Road	"	953
15	Golf Course Road	"	694
16	Twin Lakes Golf Course Bridge	"	430
17	Twin Lakes Golf Course Bridge	"	481
18	Twin Lakes Golf Course Bridge	"	511
19	Twin Lakes Golf Course	"	950
20	Twin Lakes Golf Course Bridge	"	283
21	Twin Lakes Golf Course Bridge	"	1,154
22	Golf Course Entrance Rd.	"	1,117
23	Willow Street	"	981
24	Meyersville Road	"	107

TABLE 12 (cont'd)

COPLAY CREEK STUDY AREA SIGNIFICANT OBSTRUCTIONS

Number*	Obstruction	Municipality	Approximate Flow Capacity (cfs)**
25	Private Driveway	N. Whitehall Twp.	262
26	Sand Spring Rd.	"	122
27	Private Driveway	"	44
28	Meyersville Road	"	54
29	Maple Road	"	69
30	Grouse Hall Entrance	"	520
31	Grouse Hall Pond	"	560
32	Willow Street	"	53
33	Quarry Street	"	76
34	Quarry Street	"	536
35	Private Road	"	818
36	Abandoned Railroad	"	917
37	Private Road	"	594
38	Abandoned Railroad	"	345
39	Abandoned Railroad	Whitehall Twp.	685
40	Reliance Street[4]	"	525
41	Private Road	"	650
42	Private Dam	"	612
43	Private Road	"	1,904
44	Chestnut Street[5]	"	184
45	Abandoned Railroad	"	1,754
46	Abandoned Railroad	"	345
47	Columbia Street[6]	"	1,058
48	Abandoned Railroad	"	611
49	Columbia Street[7]	"	60
50	Private Driveway	"	60
51	Ringer Road	"	29
52	Mechanicsville Rd.	"	10
53	MacArthur Road (Rte. 145)	"	688
54	Municipal Building Entrance	"	665
55	Private Foot Bridge	"	269
56	Private Road	"	987
57	Abandoned Railroad	"	455
58	Whitehall Twp. Park	"	1,193
59	Whitehall Twp. Park	"	587
60	Whitehall Twp. Park	"	548
61	Whitehall Twp. Park	"	782
62	Lehigh Street[9]	"	791
63	Railroad Bridge at Eberhart Rd.[10]	"	884
64	Railroad Bridge at Water St.[10]	"	337

TABLE 12 (cont'd)

COPLAY CREEK STUDY AREA SIGNIFICANT OBSTRUCTIONS

Number*	Obstruction	Municipality	Approximate Flow Capacity (cfs)**
65	Rockdale Road	N. Whitehall Twp.	69
66	Rockdale Road	"	348
67	Rockdale Road		145
68	Rockdale Road	"	226
69	Private Road	"	328
70	Private Road	"	91
71	Private Road	"	364
72	Private Road	"	309
73	Neffs-Laurys Road	"	403
74	Private Road	Whitehall Twp.	87
75	Peach Bottom Rd.[11]	"	617
76	Overlook Lane[12]	"	846
77	Robin Street[13]	"	977
78	Private Road	"	419
79	Private Foot Bridge	"	348
80	Railroad Bridge	"	401
81	High Hill Road	Washington Twp.	6
82	Riverview Road	"	143
83	Red Hill Road	N. Whitehall Twp.	147
84	Riverview Road	"	70
85	Railroad Bridge	"	69
86	Railroad Bridge	"	***
87	Route 145	"	48
88	Private Driveway	"	123
89	Private Driveway	"	123
90	Private Driveway	"	15
91	Private Pond Entrance	"	78
92	Private Pond Outflow	"	10
93	Clearview Road	"	96
94	Private Road	"	200
95	Route 145	"	96
96	Railroad Bridge	"	118

*Numbers are keyed to significant obstructions map (Figure 9).
**Estimated capacities are for illustration only and should not be used as absolute capacities for stormwater management decisions.
***Unable to estimate capacity due to collapse of structure.

[1]Significant Obstruction Nos. 5-8 coincide with Problem Area No. 1

[2]Significant Obstruction No. 12 coincides with Problem Area No. 2

[3]Significant Obstruction No. 13 coincides with Problem Area No. 3

[4]Significant Obstruction No. 40 coincides with Problem Area No. 4

[5]Significant Obstruction No. 44 coincides with Problem Area No. 6

[6]Significant Obstruction No. 47 coincides with Problem Area No. 7

[7]Significant Obstruction No. 49 coincides with Problem Area No. 10

[8]Significant Obstruction No. 51 coincides with Problem Area No. 11

[9]Significant Obstruction No. 62 coincides with Problem Area No. 12

[10]Significant Obstruction Nos. 63 and 64 coincide with Problem Area No. 13

[11]Significant Obstruction No. 76 coincides with Problem Area No. 14

[12]Significant Obstruction No. 77 coincides with Problem Area No. 15

[13]Significant Obstruction No. 78 coincides with Problem Area No. 16

B-2 Maps and Descriptions of Storm Drainage Problem Areas for Jordan Creek

JORDAN CREEK WATERSHED EXISTING STORM DRAINAGE PROBLEM AREAS AND SIGNIFICANT OBSTRUCTIONS

A. Existing Storm Drainage Problem Areas

An important goal of Act 167 is to prevent any existing storm drainage problem areas from getting worse. The first step toward that goal is to identify the existing problem areas. Each municipality in the Jordan Creek Watershed was provided with an opportunity to document the existing drainage problems within its borders. The starting point for the drainage problem inventory was the JPC Regional Storm Drainage Plan (RSDP) which documented sixteen (16) problems throughout the watershed based on a municipal survey conducted prior to 1975. Each municipality had an opportunity to review the RSDP data, provide an updated status on whether the RSDP problems remained or had been corrected, and provide information on additional problem areas. This process resulted in the documentation of sixteen (16) existing drainage problems in the watershed. The type of problem identified was typically street and/or property flooding. Figure 8 is a map of the Jordan Creek Watershed indicating the storm drainage problem areas as identified as part of the Storm Water Management Plan. The problem areas on Figure 8 are number coded and keyed to the problem area descriptions presented in Table 12. The "Subarea" and "Reach No." columns in Table 12 refer to the location of the problem areas relative to the watershed breakdown for modeling purposes. A subarea is the finest unit of breakdown of the watershed for which runoff values have been calculated. A reach is the swale, channel or stream segment which drains a particular subarea. Note that three (3) of the drainage problems are on identified reaches indicating that peak runoff values are readily available from the modeling process for those problem areas. These runoff values could be used as input for design of remedial measures.

The final column in Table 12 lists generalized proposed solutions to the identified storm drainage problem areas. These generalized solutions have been provided by municipal representatives whether as part of the original problem area documentation or subsequent discussions. Proposed solutions listed include specific proposals based upon municipal studies of the problem areas, where available, and solutions which are readily apparent to the municipal representatives for the less complicated problem areas. For certain other problem areas, the solutions are not quite so apparent and may require detailed engineering evaluations to determine the most

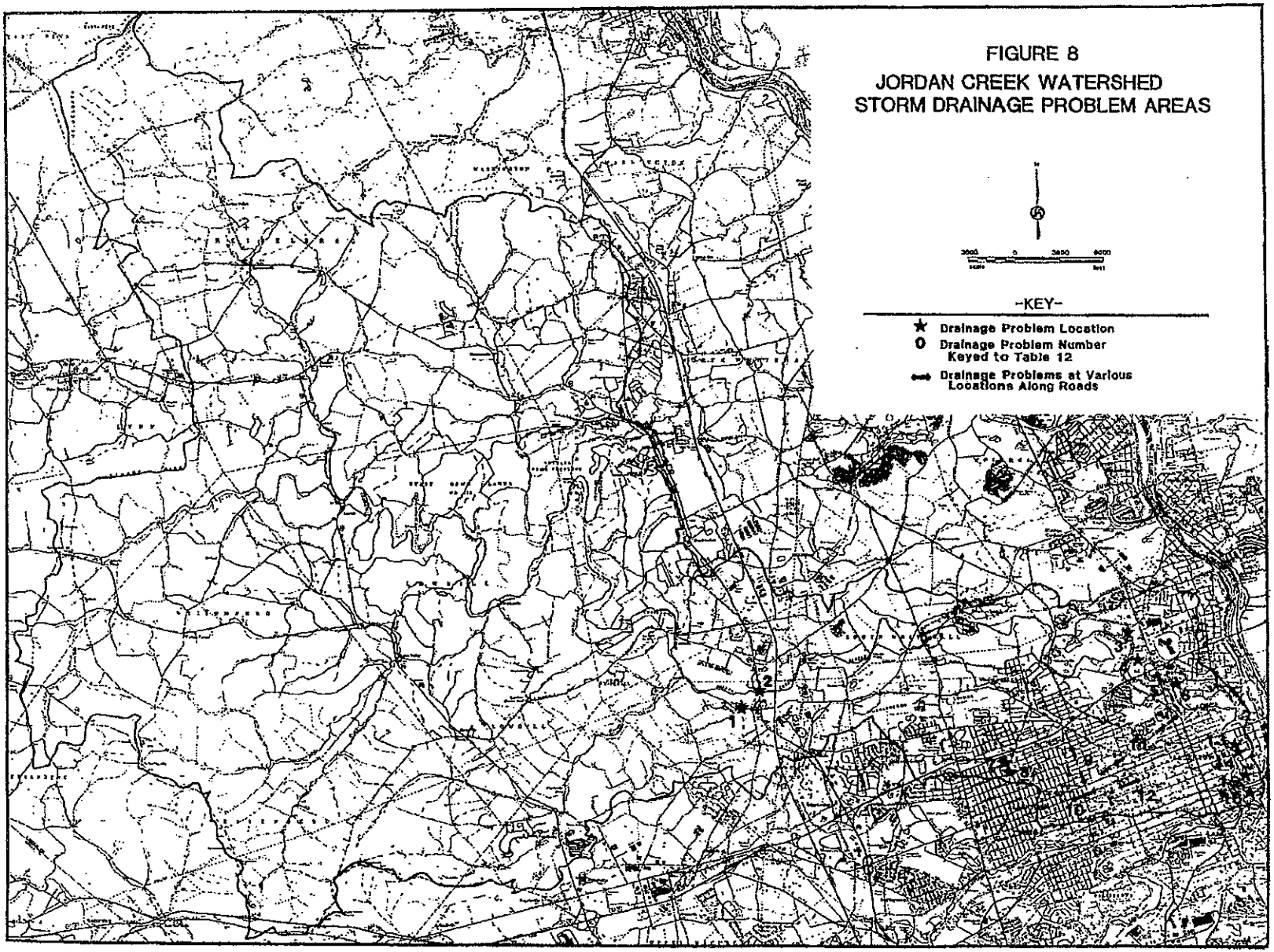


FIGURE 8
JORDAN CREEK WATERSHED
STORM DRAINAGE PROBLEM AREAS
-KEY-
Drainage Problem Location
Drainage Problem Number Keyed to Table 12
Drainage Problems at Various Locations Along Roads

TABLE 12
JORDAN CREEK WATERSHED
STORM DRAINAGE PROBLEM AREAS

No.	Location	Municipality	Problem Description	Subarea No.	Reach No.	Proposed Solution
1	Main Street at Guthsville	South Whitehall	Street Flooding	117	115, 116	None proposed
2	Rt. 309 over Jordan Creek at Guthsville	South Whitehall	Street Flooding	120	119	None proposed
3	Helfrich Springs Apts.	Whitehall	Property Flooding	130	--	None proposed
4	Whitehall Estates Townhouses	Whitehall	Street and Property Flooding	131	--	None proposed
5	North 7th Street (between City Line and Rt. 22)	Whitehall	Street Flooding	131, 133, 143	--	None proposed
6	Park View Apts.	Whitehall	Property Flooding	143	136	None proposed
7	Pennsylvania Street (between 26th and 27th Streets)	South Whitehall	Street Flooding	139	--	Storm Sewers
8	26th and Highland Streets	Allentown	Street Flooding	139	--	Improve collection system (by South Whitehall Township)
9	19th Street (between Tilghman and Highland Streets)	Allentown	Street Flooding	140	--	Relief Line
10	Andrew Street (between 18th and 21st)	Allentown	Street Flooding, Undersized collection conduit	140	--	None proposed

TABLE 12 (cont'd)
JORDAN CREEK WATERSHED
STORM DRAINAGE PROBLEM AREAS

No.	Location	Municipality	Problem Description	Subarea No.	Reach No.	Proposed Solution
11	Sumner Avenue (between 6th and 17th Streets)	Allentown	Street Flooding	141, 142, 143	--	Add/Improve inlets
12	Liberty Street (between 13th and 15th Streets)	Allentown	Street Flooding	142	--	Improve Inlets
13	224 North 3rd Street	Allentown	Street and Property Flooding	144	--	None proposed
14	3rd & Gordon Streets	Allentown	Street Flooding	145	--	None proposed
15	3rd & Linden Streets	Allentown	Street Flooding from debris	145	--	Removal of RR piers and bridge
16	3rd & Union Streets	Allentown	Street Flooding	145	--	None proposed

cost-effective solution. No solutions to these problem areas are available and are listed as "None proposed" in Table 12.

B. Significant Obstructions

An obstruction in a watercourse can be defined borrowing from Chapter 105 of DER's Rules and Regulations as follows:

> "Any dike, bridge, culvert, wall, wingwall, fill, pier, wharf, embankment, abutment or other structure located in, along, or across or projecting into any ... channel or conveyance of surface water having defined bed and banks, whether natural or artificial, with perennial or intermittent flow."

Using the above-definition, two hundred and nine (209) obstructions have been identified and measured within the Jordan Creek Watershed. For each of these, an estimated flow capacity has been calculated. For the purposes of Act 167, it is necessary to refine the list of obstructions to include only those obstructions which are "significant" on a watershed basis. For the Jordan Creek Storm Water Management Plan, the following distinction has been used:

> An obstruction in a stream or channel shall be deemed "significant" if it has an estimated flow capacity which is less than the 10-year return period peak flow from the calibrated hydrologic model of the watershed prepared as part of the Act 167 Plan.

Using the refined definition, one hundred and eighteen (118) significant obstructions have been identified within the Jordan Creek Watershed and are shown in Figure 9. A list of the significant obstructions is presented in Table 13 which indicates the obstruction number, description, municipality and approximate flow capacity. Obstruction capacities have been estimated based on their upstream geometry as measured and bed slope and roughness factors (where applicable) consistent with the calibrated Penn State Runoff Model for the Jordan Creek Watershed. The estimates reflect reasonable flow capacities of the obstructions for "open channel" flow conditions (i.e. where the obstructions are not submerged). These estimated capacities are for illustration only and shall not be used as absolute capacities for storm water management decisions. The capacity of any obstruction when used to meet the requirements of this Plan shall be

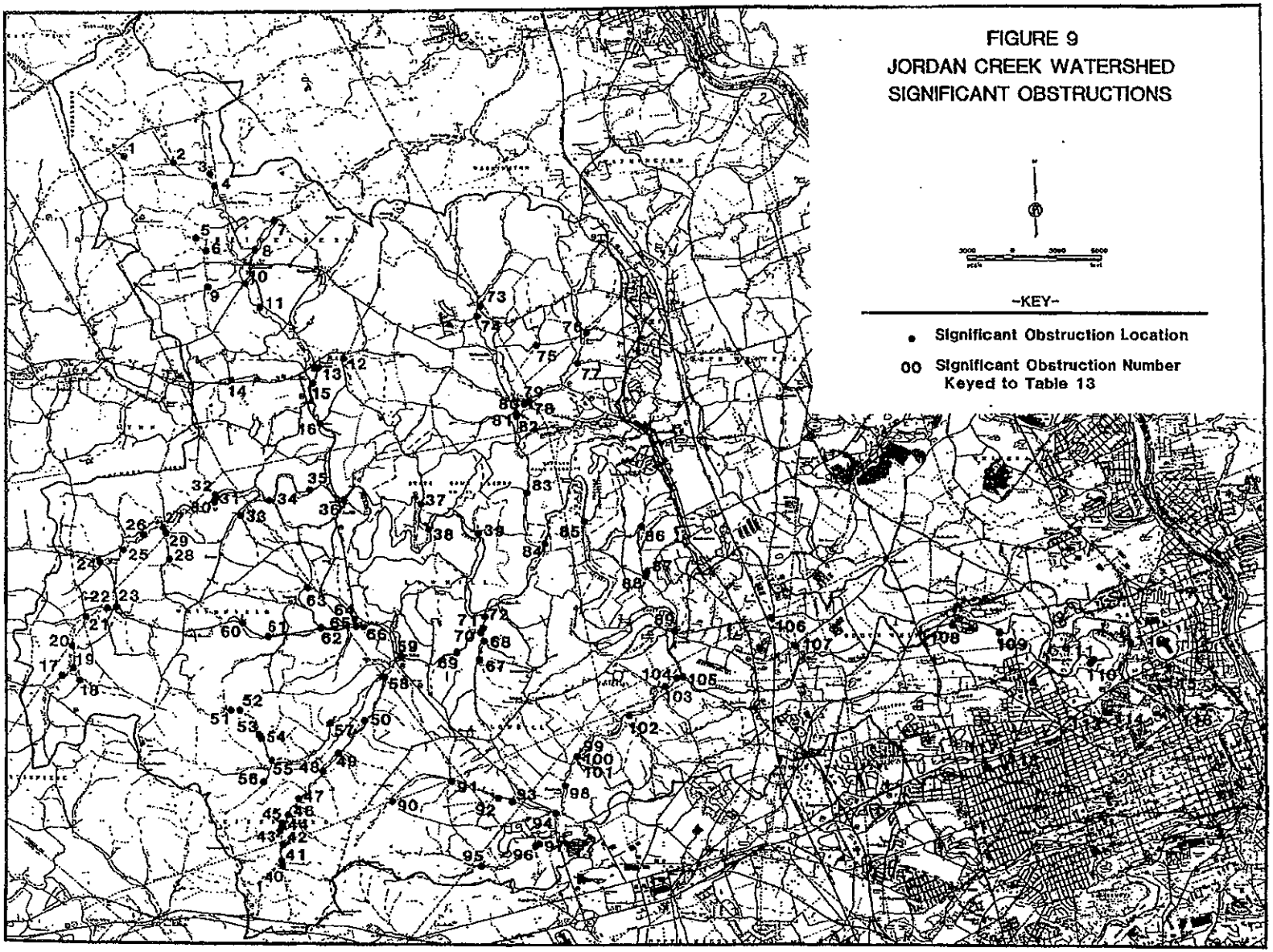


FIGURE 9
JORDAN CREEK WATERSHED
SIGNIFICANT OBSTRUCTIONS
-KEY-
Significant Obstruction Location
00 Significant Obstruction Number
Keyed to Table 13

based upon a detailed hydraulic investigation including possible headwater and tailwater conditions, obstruction configuration (abutments, wingwalls, piers, etc.) field measured slopes and other conditions as may affect capacity for design flows.

There is one identified significant obstruction which coincides with a documented storm drainage problem area as indicated in Table 13. The obstruction which coincides with a drainage problem area is located at Pennsylvania and 27th Streets in South Whitehall Township. The importance of the identified significant obstructions and problem areas as part of the development of a runoff control strategy is discussed in Chapter VIII.

TABLE 13

JORDAN CREEK WATERSHED SIGNIFICANT OBSTRUCTIONS

Number*	Obstruction	Municipality	Aproximate Flow Capacity (cfs)**
1	Private Road	Heidelberg Twp.	160
2	Private Road	"	20
3	Reidy Mill Road	"	550
4	Mantz Road	"	600
5	Private Road	"	130
6	Central Road	"	170
7	Bachman Road	"	250
8	Bake Oven Road	"	180
9	Central Road	"	130
10	Hunters Hill Road	"	1,700
11	Private Road	"	1,500
12	Kistler Road	"	120
13	Water Pond Road	"	140
14	Snyder Road	"	10
15	Water Pond Road	"	420
16	Old Route 100	"	1,900
17	Private Road	Weisenberg Twp.	60
18	Private Road	"	10
19	Kline's Dam Road	"	90
20	Kistler Lane	"	230
21	Schochary Road	Lynn Twp.	550
22	Creamery Road	Weisenberg Twp.	570
23	Winding Road	"	220
24	Snyder Road	Lynn Twp.	70
25	Private Road	"	1,100
26	Private Road	"	200
27	Ross Valley Road	"	970
28	Ross Valley Road	Weisenberg Twp.	50
29	Ross Valley Road	Lynn Twp.	40

TABLE 13 (cont'd)

JORDAN CREEK WATERSHED SIGNIFICANT OBSTRUCTIONS

Number*	Obstruction	Municipality	Aproximate Flow Capacity (cfs)**
30	Private Road	Weisenberg Twp.	680
31	Private Road	"	640
32	Private Road	"	890
33	Gun Club Road	"	40
34	Bittner's Corner Road	Lowhill Twp.	350
35	Narris Road	"	1,300
36	Game Warden Road	"	3,900
37	Game Warden Road	"	140
38	Private Road	"	40
39	Scheirers Road	"	340
40	Seipstown Road	Weisenberg Twp.	410
41	Private Road	"	140
42	Valley Road	"	40
43	Dam	"	520
44	Private Walk Bridge	"	380
45	Private Road	"	370
46	Boger Stadt Road	"	300
47	Private Road	"	140
48	Distillery Road	"	290
49	Valley Road	"	780
50	Masters Hill Road	"	330
51	Run Road	"	90
52	Tannery Road	"	80
53	Dam	"	10
54	Private Road	"	180
55	Blacksmith Road	"	150
56	Kuhn's Hill Road	"	200
57	Moyer Road	"	920
58	Valley Road	"	1,500
59	Lyon Valley Hill	Lowhill Twp.	860
60	Holben's Valley Road	Weisenberg Twp.	70
61	Private Road	"	50
62	Weisenberg Church Road	"	470
63	Seibert Road	"	40
64	Holben's Valley Road	Lowhill Twp.	360
65	Holben's Valley Road - Old Bridge	"	70
66	Private Road	"	940
67	Private Road	"	60
68	Church Road	"	90

TABLE 13 (cont'd)

JORDAN CREEK WATERSHED SIGNIFICANT OBSTRUCTIONS

Number*	Obstruction	Municipality	Aproximate Flow Capacity (cfs)**
69	Orchard Road	Lowhill Twp.	70
70	Orchard Road	"	150
71	Orchard Road	"	590
72	Private Walk Bridge	"	530
73	Church Road	Heidelberg Twp.	190
74	Heidelberg Heights Road	"	300
75	Washington Street	Washington (L) Twp.	140
76	Washington Street	"	120
77	Copeechan Road	North Whitehall Twp.	300
78	Private Road	Heidelberg Twp.	380
79	Private Road	"	740
80	Dam	"	340
81	Dam	"	480
82	Private Road	"	2,000
83	Schneck Road	Lowhill Twp.	2,000
84	Mill Creek Road	"	5,700
85	Game Preserve - Ford	North Whitehall Twp.	1,700
86	Old Packhouse Road	"	80
87	Dam	"	20
88	Gristmill Road	"	240
89	Dam	"	1,200
90	Mohr Lane	Weisenberg Twp.	60
91	Apple Drive	"	250
92	Private Road	Lowhill Twp.	20
93	Orchard Road	"	200
94	Mohr's Road	Upper Macungie Twp.	170
95	Apple Drive	"	230
96	Orchard Road	"	330
97	Old Bridge - Abandoned	"	420
98	Dam	"	180
99	Dam	"	770
100	Private Walk Bridge	"	680
101	Dam	"	720
102	Private Road	South Whitehall Twp.	1,500
103	Valley Road	"	1,100
104	Private Road	"	680
105	Jordan Road	"	1,100
106	Orefield Road	"	10
107	Parkland Terrace	"	50
108	Dam	"	2,500
109	Dam	"	1,700

TABLE 13 (cont'd)

JORDAN CREEK WATERSHED SIGNIFICANT OBSTRUCTIONS

Number*	Obstruction	Municipality	Aproximate Flow Capacity (cfs)**
110	Jordan Park Bridge	Whitehall Twp.	5,600
111	Jordan Park Bridge	"	3,600
112	Mickley Road	"	5,300
113	14th Street	"	10
114	Spring Ridge Apartments	"	60
115	7th Street	Allentown	3,500
116	Dam - Jordan Park	"	50
117	28th Street	South Whitehall Twp.	40
118[1]	Pennsylvania/ 27th Street	"	0

*Numbers are keyed to significant obstructions map (Figure 9).
**Estimated capacities are for illustration only and should not be used as absolute capacities for stormwater management decisions.

[1]This coincides with problem area No. 7.

B-3 Maps and Descriptions of Storm Drainage Problem Areas for Little Lehigh Creek

LITTLE LEHIGH CREEK WATERSHED EXISTING STORM DRAINAGE PROBLEM AREAS AND SIGNIFICANT OBSTRUCTIONS

A. Existing Storm Drainage Problem Areas

An important goal of Act 167 is to prevent any existing storm drainage problem areas from getting worse. The first step toward that goal is to identify the existing problem areas. Each municipality in the Little Lehigh Creek Watershed was provided with an opportunity to update the documentation of existing drainage problems within its borders. The starting point for the drainage problem inventory was the LVPC *Regional Storm Drainage Plan* (RSDP) which documented ten problems in the study area based on a municipal survey conducted prior to 1975. The 1988 Plan documented a total of 71 existing drainage problems in the study area. The type of problem identified was typically street and/or property flooding. Based on updated municipal information, there are now 62 existing problems in the study area. Figure 7 is a map of the Little Lehigh Creek Watershed indicating the storm drainage problem areas as identified as part of the Storm Water Management Plan. The problem areas on Figure 7 are number coded and keyed to the problem area descriptions presented in Table 12. The "Subarea" and "Reach No." columns in Table 12 refer to the location of the problem areas relative to the study area breakdown for modeling purposes. A subarea is the finest unit of breakdown of a watershed for which runoff values have been calculated. A reach is the swale, channel or stream segment which drains a particular subarea. Note that 43 of the drainage problems are on an identified reach indicating that peak runoff values are readily available from the modeling process for these problem areas. These runoff values could be used as input for design of remedial measures.

The final column in Table 12 was provided to list generalized solutions suggested by municipal representatives. Proposed solutions listed include specific proposals based on municipal studies of the problem areas, where available, and solutions which are readily apparent to the municipal representatives for the less complicated problem areas. For certain other problem areas, the solutions are not quite so apparent and may require detailed engineering evaluations to determine the most cost-effective solution.

B. Significant Obstructions

An obstruction in a watercourse can be defined borrowing from Chapter 105 of DER's Rules and Regulations as follows:

> "Any dike, bridge, culvert, wall, wingwall, fill, pier, wharf, embankment, abutment or other structure located in, along, or across or projecting into any ... channel or conveyance of surface water having defined bed and banks, whether natural or artificial, with perennial or intermittent flow."

Figure 7
Little Lehigh Creek Watershed
Problem Area Map

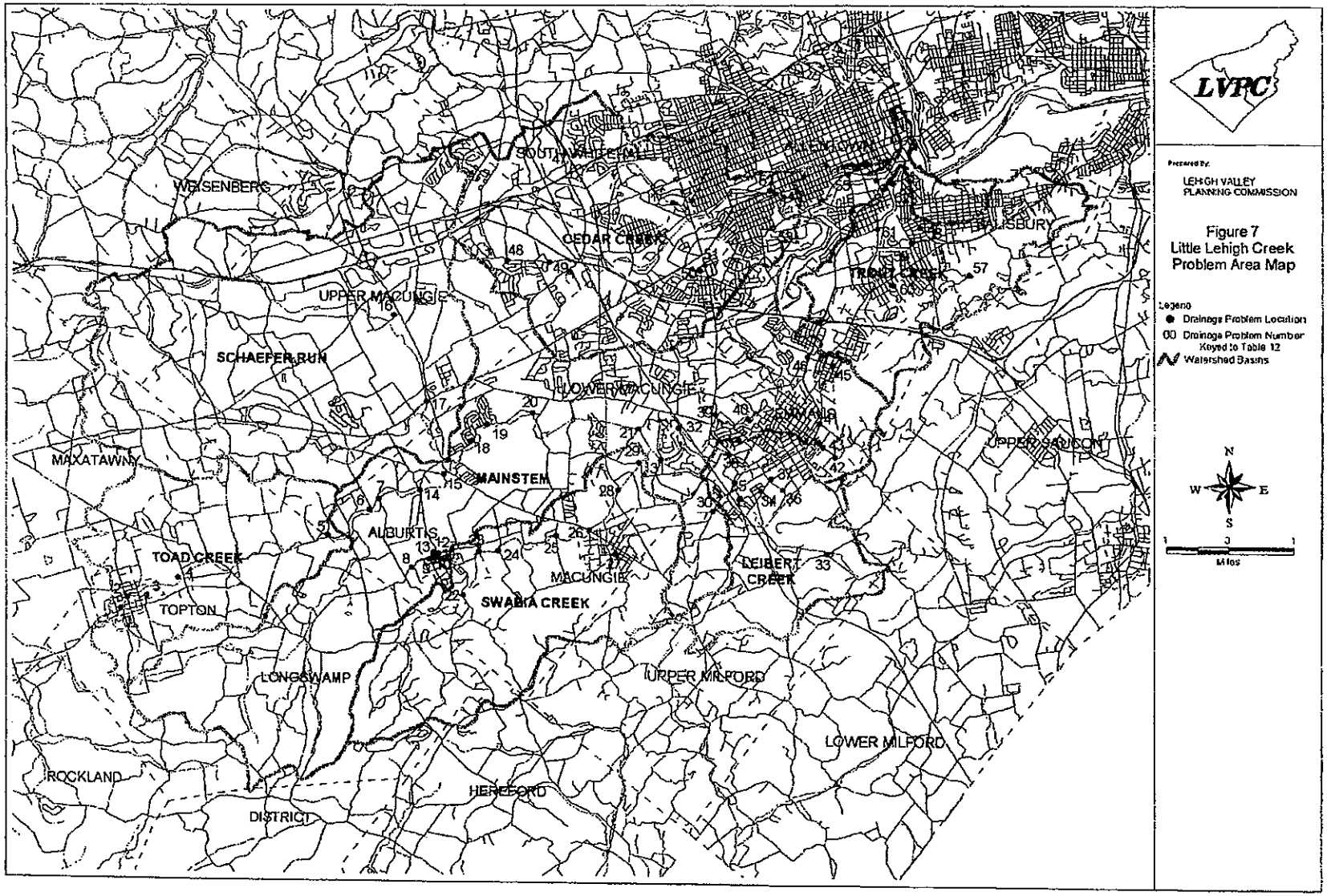

LVPC
Prepared By:
LEHIGH VALLEY
PLANNING COMMISSION
Figure 7
Little Lehigh Creek
Problem Area Map
Legend
Drainage Problem Location
00 Drainage Problem Number
Keyed to Table 12
Watershed Basins
N
W
E
S
Miles
WEISENBERG
SOUTH WHITEHALL
CEDAR CREEK
TROUT CREEK
UPPER MACUNGIE
SCHAEFER RUN
LOWER MACUNGIE
MAXATAWNY
MAINSTEM
ALBURTIS
TOAD CREEK
TOPTON
MACUNGIE
LEIBERT CREEK
SWABIA CREEK
LONGSWAMP
UPPER MILFORD
LOWER MILFORD
ROCKLAND
HEREFORD
DISTRICT

TABLE 12

LITTLE LEHIGH CREEK WATERSHED
STORM DRAINAGE PROBLEM AREAS

No.	Location	Municipality	Problem Description	Subarea No.	Reach No.	Proposed Solution
TOAD CREEK						
1.	Borough Park	Topton	Flooding and bank erosion	13	12	Dredging and Rip-Rap
2.	W. Franklin St. and Haas St.	Topton	Street flooding	13	12	Dredging and Rip-Rap
3.	Furnace Street	Topton	Street flooding	16	15	Dredging and Channel Modification
4.	Topton Sewage Treatment Plant	Longswamp	Flooding	16	15	Dredging and Rip-Rap
5.	Ash Lane north of Mertztown Rd.	Lower Macungie	Street Flooding	22	21	Channel Dredging/Realignment
LITTLE LEHIGH MAINSTEM						
6.	Mertztown Rd. west of Butz Rd.	Lower Macungie	Street Flooding	24	23	Channel Dredging/Realignment
7.	Smith Lane south of Mertztown Rd.	Lower Macungie	Street Flooding	24	23	Channel Dredging/Realignment
8.	Front Street - west end	Alburtis	Street Flooding	25	-	Enlarged Culvert
9.	Front and Walnut Streets	Alburtis	Street and field flooding	25	-	Enlarged Culvert
10.	Front and Chestnut Streets	Alburtis	Street Flooding	25	-	Enlarged Culvert
11.	Main and East Penn. Ave.	Alburtis	Street and property flooding	25	-	Storm Sewers
12.	West Penn Ave.	Alburtis	Street and building flooding	25	-	Enlarged Culvert

TABLE 12

LITTLE LEHIGH CREEK WATERSHED
STORM DRAINAGE PROBLEM AREAS

No.	Location	Municipality	Problem Description	Subarea No.	Reach No.	Proposed Solution
13.	North of West Penn. Ave	Alburtis	Field flooding	25	-	Channel Improvement
14.	Weilers Rd. at Little Lehigh Creek	Lower Macungie	Street Flooding	27	26	Channel Dredging/Realignment
15.	Creamery Road at Little Lehigh Creek	Lower Macungie	Street Flooding	27	26	Channel Dredging/Realignment
			SCHAEFER RUN			
16.	Iron Run near Township School	Upper Macungie	Property flooding	75	74	Stream Cleaning
17.	Rt. 222 west of Trexlertown	Upper Macungie	Street flooding	84	57, 82, 83	Stream Cleaning
			LITTLE LEHIGH MAINSTEM			
18.	Spring Creek Rd. between Beech and Laurel	Lower Macungie	Street Flooding	87	86	Channel Dredging/Realignment
19.	Spring Creek Rd. between Heather and Oak	Lower Macungie	Street Flooding	87	86	Channel Dredging/Realignment
20.	Spring Creek Rd.- West of Mill Creek Road	Lower Macungie	Street and field flooding	93	-	Channel Dredging/Realignment
21.	Wild Cherry Lane at Little Lehigh	Lower Macungie	Street Flooding	106	105	Channel Dredging/Realignment

SWABIA CREEK						
22.	Franklin St. at Borough line South	Alburtis	Street flooding	112	111	Church St. Bridge Replacement
23.	Church St. at Borough line East	Alburtis/Lower Macungie	Street flooding	120	118	Bridge Replacement and Channel Dredging/Realignment
24.	Schoeneck Road at Swabia Creek	Lower Macungie	Street flooding	121	120	Channel Dredging/Realignment
25.	Gehman's Road at Swabia Creek	Lower Macungie	Street flooding	123	121	Channel Dredging/Realignment
26.	West Main Street	Macungie	Street flooding	125	124	None Proposed
27.	Vine Street and Carpenter Street	Macungie	Street flooding	127	-	Storm Sewers
28.	Brookside Road at Swabia Creek	Lower Macungie	Street flooding	132	129	Channel Dredging/Realignment
29.	Sauerkraut Lane at Swabia Creek	Lower Macungie	Street flooding	133	132	Channel Dredging/Realignment

LITTLE LEHIGH MAINSTEM						
30.	Chestnut Street	Upper Milford	Street Flooding	138	-	Storm Sewers
31.	Macungie Road at Little Lehigh	Lower Macungie	Street Flooding	139	135	Channel Dredging/Realignment
32.	Millrace Road at Little Lehigh	Lower Macungie	Street Flooding	140	139	Channel Dredging/Realignment
LEIBERT CREEK						
33	East Main Rd. at Acorn Drive	Upper Milford	Street flooding	147	146	Enlarged Culvert
34.	South 12th Street	Emmaus	Street flooding	151	-	Storm Sewers
35.	Emmaus Community Park and Pool	Emmaus	Pool and property flooding	151	150	Channelize/Dredge Stream
36.	Furnace Dam at 10th and Furnace	Emmaus	Property flooding North of dam	152	-	Detention Facility and Enlarged Conveyor Pipe
37.	Broad St. at Fir Street	Emmaus	Street and property flooding	152	-	Enlarged Culvert and Dredge Stream
38.	Indian Creek Road	Upper Milford	Street flooding	154	153	Replace PennDOT Culverts with Bridge

LITTLE LEHIGH MAINSTEM						
39.	Farr Road at Little Lehigh	Lower Macungie	Street Flooding	158	156	Channel Dredging/Realignment
40.	Orchid Place - West Of Orchid Circle	Lower Macungie	Street Flooding	158	156	Channel Dredging/Realignment
41.	Main Street at Klines Lane	Emmaus	Street Flooding	159	159	Enlarged Culverts
42.	South Second Street	Upper Milford	Street and property flooding	159	-	None proposed.
43.	Foundry Alley	Emmaus	Street and property flooding	159	-	None proposed.
44.	South Second St. at Adrian/ Peach/Keystone Sts.	Emmaus	Street and property flooding	159	-	Property Acquisition and Detention Facility
45.	Fox Street	Emmaus	Street Flooding		-	Storm Sewers and Detention Facility
46.	Lehigh Street (at South Mall)	Salisbury	Property Flooding	161	-	None proposed.
CEDAR CREEK						
47	Crackersport Rd. near Days Inn	South Whitehall	Street flooding	176	-	None Proposed
48.	Holiday Hills Area (Schantz Rd.)	Upper Macungie	Street, field and lawn flooding	181	-	Strom Sewers
49.	Muth Rd. / Schantz Rd. / Cetronia Rd. area	Upper Macungie	Street and field flooding/erosion	182	181	None Proposed

50.	Glick Avenue	South Whitehall	Street flooding	194	193	Storm Sewers
51.	Mosser Drive and Cedar Crest Blvd.	South Whitehall	Street flooding	198	-	Storm Sewers
52.	Hamilton St. between Saint Elmo and 21st Streets	Allentown	Stream overbanking	202	201	Stream Cleaning, Straightening, Widening
53.	Greenwood Rd. and Mosser St.	Allentown	Property flooding	204	203	Detention Facility
54.	Walnut St. between Lafayette and Saint Elmo Streets	Allentown	Stream overbanking	205	202	Stream Cleaning, Straightening, Widening
			LITTLE LEHIGH MAINSTEM			
55.	10th and Martin Luther King Jr. Blvd.	Allentown	Street Flooding	209	-	None proposed.
56.	Lehigh Street at Mill Street	Allentown	Street Flooding and Stream Overbanking	209	208	Stream cleaning at bridge.
			TROUT CREEK			
57.	East Mountain Road	Salisbury	Property flooding	215	-	Diversion Ditch
58.	Floodplain in vicinity of Paoli & Chapel Ave. and Trout Creek	Allentown	Street flooding and stream overbanking	215	-	Storm Sewers
59.	South 4th and Brookdale Sts.	Allentown	Street flooding	215	214	None Proposed

Using the above-definition, 364 obstructions have been identified and measured within the Little Lehigh Creek Watershed. For each of these, an estimated flow capacity has been calculated. For the purposes of Act 167, it is necessary to refine the list of obstructions to include only those obstructions which are "significant" on a watershed basis. For the Little Lehigh Creek Watershed Storm Water Management Plan, the following distinction has been used:

> An obstruction in a stream or channel shall be deemed "significant" if it has an estimated flow capacity which is less than the 10-year return period peak flow from the calibrated hydrologic model of a watershed prepared as part of the Act 167 Plan.

Using the refined definition, 187 significant obstructions have been identified within the Little Lehigh Creek Watershed and are shown in Figure 8. A list of the significant obstructions is presented in Table 13 which indicates the obstruction number, description, municipality and *approximate* flow capacity. Obstruction capacities have been estimated based on their upstream geometry as measured, bed slope and roughness factors (where applicable) consistent with the calibrated WATERSHED Model for the Little Lehigh Creek. The estimates reflect reasonable flow capacities of the obstructions for "open channel" flow conditions (i.e. where the obstructions are not submerged). These estimated capacities are for illustration only and shall not be used as absolute capacities for storm water management decisions. The capacity of any obstruction when used to meet the requirements of this Plan shall be based upon a detailed hydraulic investigation including possible headwater and tailwater conditions, obstruction configuration (abutments, wingwalls, piers, etc.), field measured slopes and other conditions as may affect capacity for design flows.

There are 12 areas where identified significant obstructions coincide with a documented storm drainage problem area as indicated in Table 13. The obstructions which coincide with a drainage problem are footnoted in Table 13 with the corresponding problem area number identified at the end of the table. The importance of the identified significant obstructions and problem areas as part of the development of a runoff control strategy is discussed in Chapter 8.

Figure 8
Little Lehigh Creek Watershed
Significant Obstructions

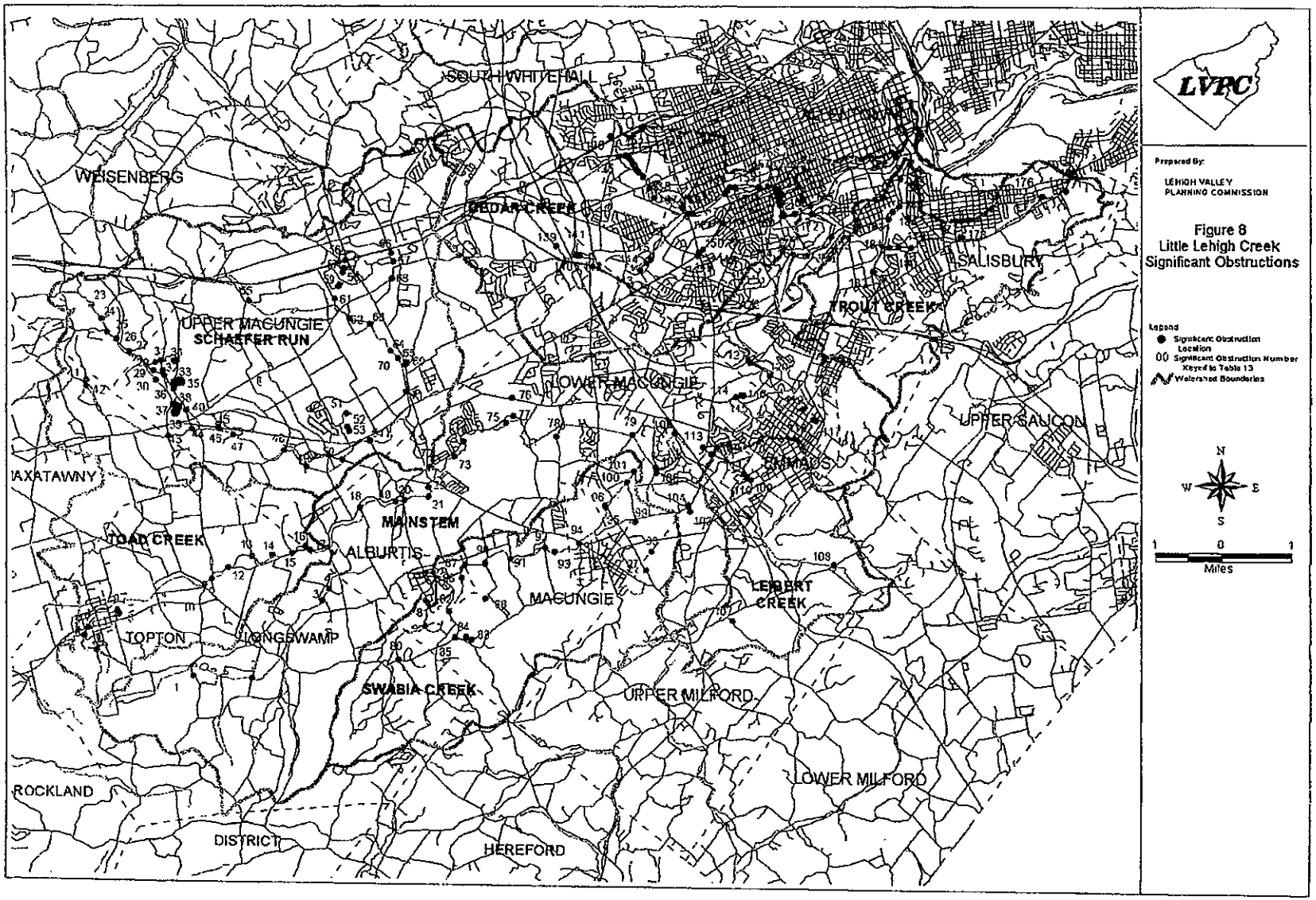

SOUTH WHITEHALL
WEISENBERG
CEDAR CREEK
SALISBURY
TROUT CREEK
UPPER MACUNGIE
SCHAEFER RUN
LOWER MACUNGIE
UPPER SAUCON
MAINSTEM
ALBURTIS
TOAD CREEK
MACUNGIE
LEHIGH CREEK
TOPTON
LONGSWAMP
SWABIA CREEK
UPPER MILFORD
LOWER MILFORD
ROCKLAND
DISTRICT
HEREFORD
LVPC
Prepared By:
LEHIGH VALLEY PLANNING COMMISSION
Figure 8
Little Lehigh Creek
Significant Obstructions
Legend
Significant Obstruction Location
00 Significant Obstruction Number Keyed to Table 13
Watershed Boundaries
N
W
E
S
1 0 1
Miles

TABLE 13

LITTLE LEHIGH CREEK WATERSHED SIGNIFICANT OBSTRUCTIONS

Number*	Obstruction	Municipality	Approximate Flow Capacity (cfs)**
1	Longsdale Road	Longswamp Township	51
2	Private Road	Longswamp Township	645
3	Hilltop Road	Longswamp Township	598
4	Ash Lane	Longswamp Township	153
5	Woodside Avenue	Longswamp Township	93
6	Callow Hill	Borough of Topton	32
7	Main Street	Borough of Topton	93
8	Smith Road	Borough of Topton	90
9	Penn Street	Borough of Topton	98
10	Barclay Street	Longswamp Township	150
11	Farmington Road	Longswamp Township	55
12	Brooksdale Road	Longswamp Township	53
13	Mertz Road	Longswamp Township	133
14	Private Road	Longswamp Township	482
15	Private Road	Longswamp Township	747
16	Ash Lane[1]	Lower Macungie Township	636
17	Mertztown Road[2]	Lower Macungie Township	777
18	Smith Lane[3]	Lower Macungie Township	1,265
19	Private Road	Lower Macungie Township	160
20	Spring Creek Road	Lower Macungie Township	2,271
21	Rail Road Bridge	Lower Macungie Township	1,671
22	Creamery Road[4]	Lower Macungie Township	253
23	Route 863 (Independent Road)	Weisenberg Township	59
24	Route 863 (Independent Road)	Weisenberg Township	88
25	Helfrich Road	Weisenberg Township	41
26	Route 863 (Independent Road)	Weisenberg Township	30
27	Route 863 (Independent Road)	Weisenberg Township	79
28	Private Drive	Upper Macungie Township	8
29	Route 863 (Independent Road)	Upper Macungie Township	18
30	Private Drive	Upper Macungie Township	251
31	Private Drive	Upper Macungie Township	15
32	Private Drive	Upper Macungie Township	45
33	Route 863 (Independent Road)	Upper Macungie Township	15
34	Private Drive	Upper Macungie Township	15
35	Zeigel's Church Rd.	Upper Macungie Township	15
36	Route 863 (Independent Drive)	Upper Macungie Township	15
37	Folk Road	Upper Macungie Township	122
38	Private Drive	Upper Macungie Township	58
39	Private Drive	Upper Macungie Township	43
40	Route 863 (Independent Drive)	Upper Macungie Township	444
41	Private Drive	Maxatawny Township	33

TABLE 13

LITTLE LEHIGH CREEK WATERSHED SIGNIFICANT OBSTRUCTIONS

Number*	Obstruction	Municipality	Approximate Flow Capacity (cfs)**
42	Albright Road	Maxatawny Township	98
43	Folk Road	Upper Macungie Township	71
44	Route 863 (Independent Drive)	Upper Macungie Township	136
45	Route 222	Upper Macungie Township	43
46	Picnic Grove Lane	Upper Macungie Township	511
47	Private Drive	Upper Macungie Township	86
48	Trexler Road	Upper Macungie Township	135
49	Wentz Road	Upper Macungie Township	139
50	Brookdale Road	Upper Macungie Township	379
51	Private Drive	Upper Macungie Township	14
52	Pond Inlet	Upper Macungie Township	326
53	Private Drive	Upper Macungie Township	292
54	Weiler's Road	Upper Macungie Township	128
55	Nestlé Way	Upper Macungie Township	237
56	Route 78	Upper Macungie Township	69
57	Route 78 Ramp	Upper Macungie Township	60
58	Sycamore Road	Upper Macungie Township	199
59	Stroh Drive	Upper Macungie Township	259
60	Railroad	Upper Macungie Township	66
61	Private Drive	Upper Macungie Township	249
62	Private Drive	Upper Macungie Township	417
63	Farm Lane near Twp. School	Upper Macungie Township	32
64	Private Drive	Upper Macungie Township	243
65	Private Drive	Upper Macungie Township	41
66	Off Mancor Drive	Upper Macungie Township	418
67	Penn Drive	Upper Macungie Township	418
68	Schantz Road	Upper Macungie Township	79
69	Parking Lot	Upper Macungie Township	13
70	Route 100	Upper Macungie Township	35
71	Railroad Street	Upper Macungie Township	157
72	Railroad	Lower Macungie Township	2,762
73	Private Drive	Lower Macungie Township	2,874
74	Private Drive	Lower Macungie Township	1,150
75	Seem Road	Lower Macungie Township	1,222
76	Lower Macungie Road	Lower Macungie Township	226
77	Spring Creek Road[5]	Lower Macungie Township	1
78	Private Drive	Lower Macungie Township	282
79	Wild Cherry Lane[6]	Lower Macungie Township	630
80	Mountain Street	Longswamp township	8
81	Gun Club Road	Lower Macungie Township	680
82	Chestnut Road	Lower Macungie Township	759
83	Private Drive	Lower Macungie Township	24

TABLE 13

LITTLE LEHIGH CREEK WATERSHED SIGNIFICANT OBSTRUCTIONS

Number*	Obstruction	Municipality	Approximate Flow Capacity (cfs)**
84	Private Drive	Lower Macungie Township	72
85	Mountain Road	Lower Macungie Township	19
86	Bike Path	Borough of Alburtis	1,321
87	Church Street	Borough of Alburtis	617
88	Private Drive	Lower Macungie Township	25
89	Schoeneck Road[7]	Lower Macungie Township	933
90	Railroad	Lower Macungie Township	816
91	Orchard Road	Lower Macungie Township	673
92	Gehman Road[8]	Lower Macungie Township	208
93	Railroad	Lower Macungie Township	600
94	Railroad	Borough of Macungie	1,238
95	Golf Course Bridge	Lower Macungie Township	274
96	Golf course Bridge	Lower Macungie Township	346
97	East Macungie Road	Upper Milford Township	176
98	Private Drive	Upper Milford Township	106
99	Railroad	Upper Milford Township	220
100	Private Drive	Lower Macungie Township	139
101	Sauerkraut Lane[9]	Lower Macungie Township	395
102	Macungie Road[10]	Lower Macungie Township	1,244
103	Railroad	Upper Milford Township	135
104	Indian Creek Road	Upper Milford Township	121
105	Private Drive	Lower Macungie Township	77
106	Mill Race Road[11]	Lower Macungie Township	1,024
107	German Road	Upper Milford Township	37
108	Main Road East[12]	Upper Milford Township	34
109	Route 29 (Cedar Crest Blvd.)	Borough of Emmaus	262
110	Golf Course Bridge	Borough of Emmaus	188
111	North Street	Borough of Emmaus	103
112	Camp Olympic	Lower Macungie Township	972
113	Camp Olympic	Lower Macungie Township	959
114	Riverbend Road	Lower Macungie Township	5,153
115	Lehigh Country Club	Lower Macungie Township	3,747
116	Lehigh Country Club	Lower Macungie Township	4,173
117	Private	Borough of Emmaus	245
118	Private	Borough of Emmaus	245
119	Harrison Street	Borough of Emmaus	266
120	Off Keystone Road	City of Allentown	574
121	Devonshire Road	City of Allentown	1,830
122	Private Drive	City of Allentown	2,064
123	Private Drive	City of Allentown	2,100
124	Lehigh Parkway North	City of Allentown	2,510
125	Rd. in front of Springhouse Jr. HS	South Whitehall Township	51

TABLE 13

LITTLE LEHIGH CREEK WATERSHED SIGNIFICANT OBSTRUCTIONS

Number*	Obstruction	Municipality	Approximate Flow Capacity (cfs)**
126	Golf Course	City of Allentown	469
127	Golf Course	City of Allentown	517
128	Golf Course	City of Allentown	214
129	Golf Course	City of Allentown	610
130	Golf Course	City of Allentown	175
131	Golf Course	City of Allentown	242
132	Golf Course	City of Allentown	273
133	Golf Course	City of Allentown	374
134	Golf Course	City of Allentown	274
135	Golf Course	City of Allentown	741
136	Trexler Park Path	City of Allentown	953
137	Trexler Park Path	City of Allentown	897
138	Trexler Park Path	City of Allentown	903
139	Werley Road	Upper Macungie Township	36
140	Spring Road	Upper Macungie Township	10
141	Private Drive	Upper Macungie Township	81
142	Private Drive	Upper Macungie Township	361
143	Dorney Park	South Whitehall Township	380
144	Dorney Park	South Whitehall Township	635
145	Dorney Park	South Whitehall Township	815
146	Route 309	South Whitehall Township	202
147	Cedar Creek Park	City of Allentown	1,635
148	Howard Johnson Parking	South Whitehall Township	88
149	Cedar Crest Boulevard	South Whitehall Township	67
150	Route 222 (Hamilton Boulevard)	South Whitehall Township	219
151	College Avenue	City of Allentown	59
152	Cedar Creek Park	City of Allentown	166
153	Ott Street	City of Allentown	2,074
154	Cedar Creek Park	City of Allentown	331
155	Cedar Creek Park	City of Allentown	165
156	Cedar Creek Park	City of Allentown	153
157	Cedar Creek Park	City of Allentown	304
158	Hamilton Boulevard	City of Allentown	1,716
159	Reading Road	City of Allentown	326
160	Foot Bridge	City of Allentown	333
161	Foot Bridge	City of Allentown	590
162	Union Street	City of Allentown	620
163	Union Street	City of Allentown	198
164	Foot Bridge	City of Allentown	192
165	Saint Elmo Street	City of Allentown	1,504
166	Saint Elmo Street	City of Allentown	1,062
167	Foot Bridge	City of Allentown	244

TABLE 13

LITTLE LEHIGH CREEK WATERSHED SIGNIFICANT OBSTRUCTIONS

Number*	Obstruction	Municipality	Approximate Flow Capacity (cfs)**
168	Mosser Street	City of Allentown	376
169	Driveway	City of Allentown	59
170	Driveway	City of Allentown	59
171	Martin Luther King Jr. Drive	City of Allentown	376
172	Private Drive	City of Allentown	490
173	Lehigh Parkway East	City of Allentown	4,687
174	Rail Road Bridge	City of Allentown	4,030
175	Private Drive	Salisbury Township	17
176	Park Entrance	Salisbury Township	51
177	Foot Bridge	Salisbury Township	429
178	Private Drive	Salisbury Township	297
179	Foot Bridge	City of Allentown	650
180	Foot Bridge	City of Allentown	238
181	Foot Bridge	City of Allentown	95
182	Fountain Street	City of Allentown	347
183	Foot Bridge	City of Allentown	611
184	Foot Bridge	City of Allentown	1,136
185	Private Drive	City of Allentown	752
186	Foot Bridge	City of Allentown	611

* Numbers are keyed to significant obstruction map (Figure 8).

** Estimated capacities are for illustration only and should not be used as absolute capacities for storm water management decisions.

[1]Significant Obstruction No. 16 coincides with Problem area No. 5.
[2]Significant Obstruction No. 17 coincides with Problem area No. 6.
[3]Significant Obstruction No. 18 coincides with Problem area No. 7.
[4]Significant Obstruction No. 22 coincides with Problem area No. 15.
[5]Significant Obstruction No. 77 coincides with Problem area Nos. 18, 19 and 20.
[6]Significant Obstruction No. 79 coincides with Problem area No. 21.
[7]Significant Obstruction No. 89 coincides with Problem area No. 24.
[8]Significant Obstruction No. 92 coincides with Problem area No. 25.
[9]Significant Obstruction No. 101 coincides with Problem area No. 29.
[10]Significant Obstruction No. 102 coincides with Problem area No. 31.
[11]Significant Obstruction No. 106 coincides with Problem area No. 32.
[12]Significant Obstruction No. 108 coincides with Problem area No. 33.

APPENDIX C

C-1 NRCS Type II 24-Hour Rainfall Distribution (Graphic & Tabular)

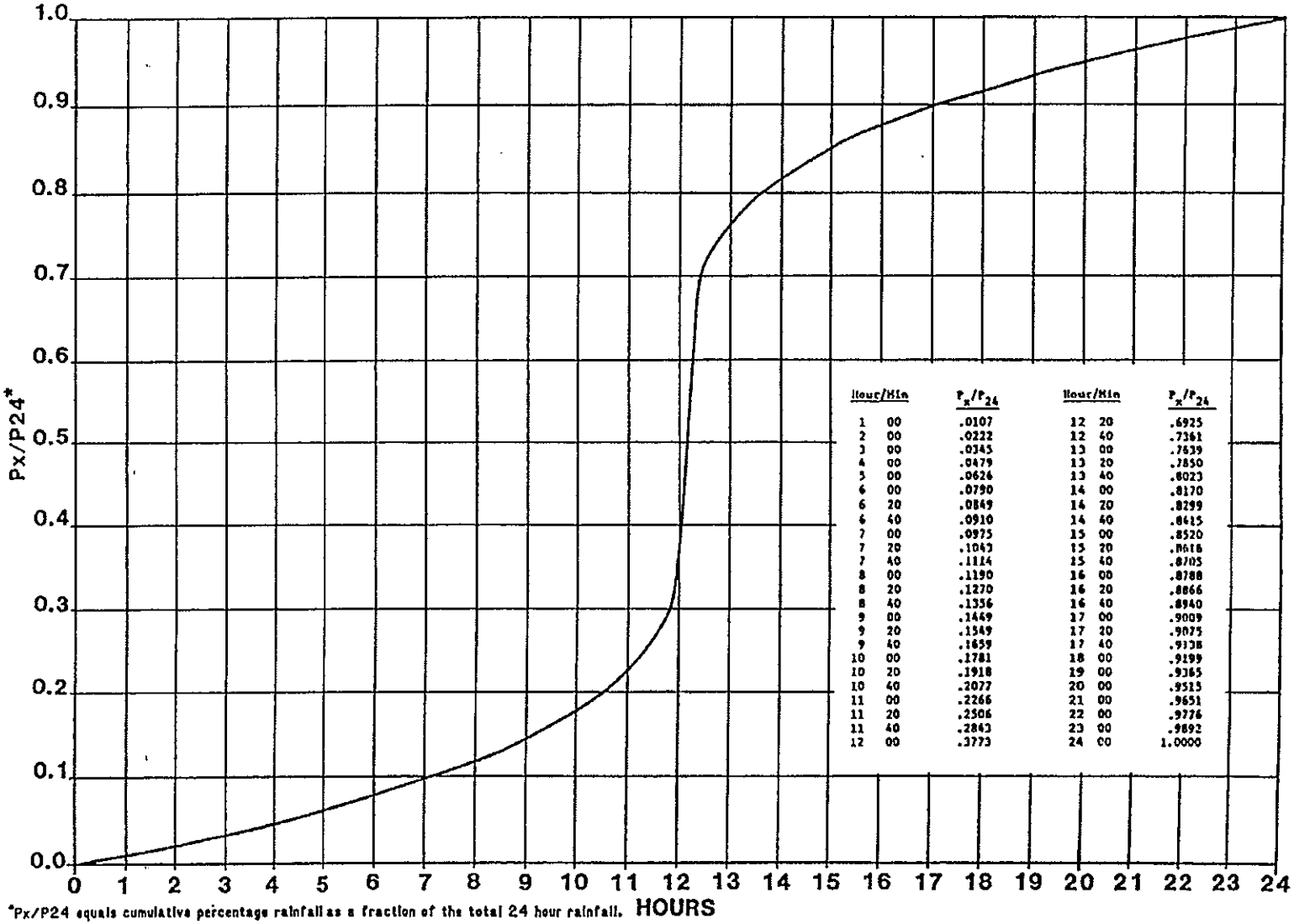
C-2 Intensity-Duration-Frequency Curves

C-3 Runoff Curve Numbers and Percent Imperviousness Values

C-4 Runoff Coefficients for the Rational Method

C-5 Manning 'n' Values

NRCS TYPE II RAINFALL DISTRIBUTION

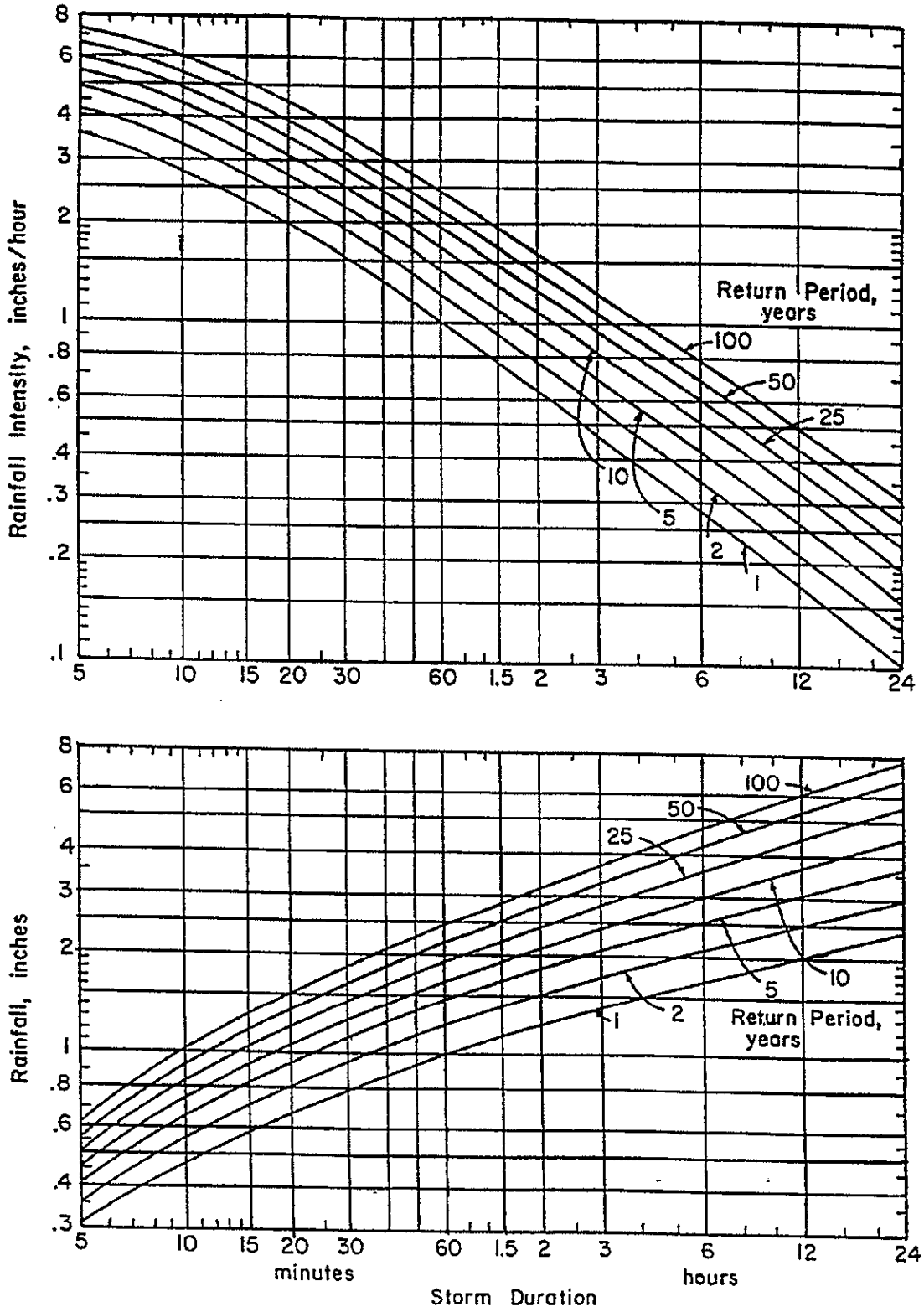


Hour/Min	P_x/P_{24}	Hour/Min	P_x/P_{24}
1 00	.0107	12 20	.6925
2 00	.0222	12 40	.7361
3 00	.0345	13 00	.7639
4 00	.0479	13 20	.7850
5 00	.0626	13 40	.8023
6 00	.0790	14 00	.8170
6 20	.0849	14 20	.8299
6 40	.0910	14 40	.8415
7 00	.0975	15 00	.8520
7 20	.1043	15 20	.8618
7 40	.1114	15 40	.8705
8 00	.1190	16 00	.8788
8 20	.1270	16 20	.8866
8 40	.1356	16 40	.8940
9 00	.1449	17 00	.9009
9 20	.1549	17 20	.9075
9 40	.1659	17 40	.9138
10 00	.1781	18 00	.9199
10 20	.1918	19 00	.9365
10 40	.2077	20 00	.9515
11 00	.2266	21 00	.9651
11 20	.2506	22 00	.9776
11 40	.2843	23 00	.9892
12 00	.3773	24 00	1.0000

*Px/P24 equals cumulative percentage rainfall as a fraction of the total 24 hour rainfall.

C-1

INTENSITY-DURATION-FREQUENCY CURVES*



*Source:Pennsylvania Dept. of Transp. Design Rainfall Curves (1986).

RUNOFF CURVE NUMBERS AND PERCENT IMPERVIOUSNESS VALUES*

Cover Description		Curve numbers for hydrologic soil group**			
Land Use/Cover Type	Average percent impervious area	A	B	C	D
Open space (lawns, parks, golf courses, cemeteries, etc.):					
Good condition (grass cover greater than 75%).....		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way).....		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way).....		98	98	98	98
Paved; open ditches (including right-of-way).....		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
c acre or less (townhouses)65	77	85	90	92	
¼ acre.....	38	61	75	83	87
a acre	30	57	72	81	86
½ acre.....	25	54	70	80	85
1 acre.....	20	51	68	79	84
2 acres	12	46	65	77	82
Woods		30	55	70	77
Agriculture		Refer to Table 2-2b in source document (TR55) by crop type and treatment.			

*Source: Natural Resources Conservation Service Technical Release No. 55, Second Edition, June 1986.

**Hydrologic Soil Group based on the County Soil Survey latest edition.

RUNOFF COEFFICIENTS FOR THE RATIONAL METHOD* HYDROLOGIC SOIL GROUP AND SLOPE RANGE**												
	A			B			C			D		
LAND USE	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
Cultivated[A]	[a]0.18 [b]0.23	0.23 0.29	0.28 0.34	0.24 0.30	0.29 0.36	0.33 0.40	0.30 0.36	0.34 0.41	0.38 0.45	0.33 0.39	0.37 0.44	0.41 0.48
Pasture[B]	0.09 0.12	0.13 0.17	0.17 0.23	0.19 0.24	0.24 0.30	0.29 0.36	0.27 0.33	0.31 0.38	0.36 0.43	0.31 0.37	0.35 0.42	0.39 0.46
Meadow, Lawn[C]	0.05 0.07	0.08 0.12	0.12 0.17	0.15 0.19	0.20 0.25	0.24 0.30	0.23 0.28	0.28 0.34	0.32 0.39	0.28 0.33	0.32 0.39	0.36 0.43
Forest, Woods	0.03 0.04	0.05 0.08	0.08 0.12	0.11 0.15	0.16 0.21	0.20 0.26	0.20 0.25	0.25 0.31	0.29 0.36	0.25 0.31	0.30 0.37	0.34 0.41
Gravel	0.24 0.30	0.29 0.36	0.33 0.40	0.32 0.38	0.36 0.43	0.40 0.47	0.35 0.42	0.39 0.46	0.43 0.50	0.37 0.44	0.41 0.48	0.44 0.51
Parking, Other Impervious	0.85 0.95	0.86 0.96	0.87 0.97	0.85 0.95	0.86 0.96	0.87 0.97	0.85 0.95	0.86 0.96	0.87 0.97	0.85 0.95	0.86 0.96	0.87 0.97
Residential, Commercial, Industrial and Other "Developed"	Runoff coefficients should be calculated based upon weighted average of impervious area coefficients and pervious area coefficients from above based upon soil type, slope and the particular development proposal.											

*Coefficients for all land uses except parking and other impervious cover are based on the Rossmiller Equation for translating NRCS curve numbers into Rational Method 'c' values. The source for the parking and other impervious cover coefficients is RAWLS, W.J., S.L. WONG and R.H. McCUEN, 1981. Comparison of urban flood frequency procedures. Preliminary draft report prepared for the Soil Conservation Service, Beltsville, MD.

**Hydrologic Soil Group based on the county soil survey latest edition.

a – Runoff coefficients for storm recurrence intervals less than 25 years.

b – Runoff coefficients for storm recurrence intervals of 25 years or more.

[A]Represents average of cultivated land with and without conservation treatment from TR-55, January 1975. These values are consistent with several categories of cultivated lands from TR-55, June 1986.

[B]Represents grasslands in fair condition with 50% to 75% grass cover.

[C]Represents grasslands in good condition with greater than 75% grass cover.

MANNING 'n' VALUES BY TYPICAL REACH DESCRIPTION

Reach Description	Manning 'n'
Natural stream, clean, straight, no rifts Or pools	0.030
Natural stream, clean, winding, some pools And shoals	0.040
Natural stream, winding, pools, shoals, Stony with some weeds	0.050
Natural stream, sluggish with deep pools And weeds	0.070
Natural stream or swale, very weedy or With timber under brush	0.100
Concrete pipe, culvert or channel	0.012
Corrugated metal pipe	0.012-0.027*

*Depending upon type and diameter.

ROUGHNESS COEFFICIENTS (MANNING 'n') FOR SHEET FLOW

Surface Description	Manning 'n'[1]
Smooth surfaces (concrete, asphalt, gravel, or bare soil)	0.011
Fallow (no residue)	0.050
Cultivated soils:	
Residue cover <= 20%	0.060
Residue cover > 20%	0.170
Grass:	
Short grass prairie	0.150
Dense grasses[2]	0.240
Bermuda grass	0.410
Range (natural)	0.130
Woods:[3]	
Light underbrush	0.400
Dense underbrush	0.800

[1]The n values are a composite of information compiled by Engman (1986).
[2]Includes species such as weeping lovegrass, bluegrass, buffalo grass, blue grama grass and native grass mixtures.
[3]When selecting n, consider cover to a height of about 0.1 ft. this is the only part of the plant cover that will obstruct sheet flow.

APPENDIX D

*Recommendation Chart for Infiltration Stormwater Management BMPs in Carbonate Bedrock**

SITE RISK FACTORS	Geology Type	CARBONATE BEDROCK																													
	Effective Soil Thickness	Less than 2 Feet	2 to 4 Feet									Over 4 Feet to 8 Feet									Over 8 Feet										
	Special Geologic Features**	Low/Med/High Buffer	Low Buffer			Medium Buffer			High Buffer			Low Buffer			Medium Buffer			High Buffer			Low Buffer			Medium Buffer			High Buffer			
SITE INVESTIGATION RECOMMENDED		(Unacceptable)	Preliminary			Preliminary			Preliminary			Preliminary			Preliminary			Preliminary			Preliminary			Preliminary			Preliminary			
DESIGN FACTORS	Infiltration Loading Rates (% Increase) ***	(Unacceptable)	0-100%	100-300%	300 - 500%	0-100%	100-300%	300 - 500%	0-100%	100-300%	300 - 500%	0-100%	100-300%	300 - 500%	0-100%	100-300%	300 - 500%	0-100%	100-300%	300 - 500%	0-100%	100-300%	300 - 500%	0-100%	100-300%	300 - 500%	0-100%	100-300%	300 - 500%		
PROGRAM SUMMARY GUIDANCE ****																															

RECOMMENDED

NOT RECOMMENDED

* Source: Developed by Cahill Associates based on information in "Technical Best Management Practice Manual & Infiltration Feasibility Report", November 2002 and input from the LVPC, 2003.

** Special Geologic Feature Buffer widths are as follows:

Low Buffer is less than 50 feet
Medium Buffer is 50 feet to 100 feet
High Buffer is greater than 100 feet

*** Rates greater than 500% not recommended.

**** Assumes adequately permeable soils and lack of natural constraints as required for all infiltration systems.

1 Infiltration systems may be allowed at the determination of the Engineer and/or Geologist, provided that a Detailed Site Investigation is undertaken which confirms nature of rock, location of Special Geologic Features, and adequacy of the buffer between the SGF and the proposed stormwater system(s).

2 In these Special Geologic Features: Low Buffer situations, infiltration systems may be allowed at the determination of the Engineer and/or Geologist, provided that a Detailed Site Investigation is undertaken and a 25 foot buffer from SGFs is maintained.

APPENDIX E

Prepared By:

Return To: South Whitehall Township
4444 Walbert Avenue
Allentown, PA 18104
610.398.0401

Tax Parcel ID:

DECLARATION OF COVENANTS AND EASEMENT FOR MAINTENANCE OF STORMWATER MANAGEMENT FACILITIES

THIS DECLARATION OF COVENANTS AND EASEMENT FOR MAINTENANCE OF STORMWATER MANAGEMENT FACILITIES (**"Declaration"**) is dated as of the _____ day of _____, 20____ and is made by and between the **TOWNSHIP OF SOUTH WHITEHALL**, a municipal corporation, Township of the First Class, located at 4444 Walbert Avenue, Allentown, Lehigh County, Pennsylvania 18104-1699 (**"Township"**), and _____ with an address of _____ (**"Declarant"** or **"Owner"**).

NOTICE TO PROSPECTIVE PURCHASERS:

THIS DECLARATION CONSTITUTES A COVENANT RUNNING WITH THE LAND IDENTIFIED HEREIN AS THE SUBJECT PREMISES. PROSPECTIVE PURCHASERS ARE HEREBY NOTIFIED THAT THE OBLIGATIONS HEREIN WILL BE BINDING UPON THEM IF THEY BECOME OWNER OF THE SUBJECT PREMISES.

WHEREAS, Declarant is the owner of that certain _____ acre parcel of land situate in the Township of South Whitehall, County of Lehigh, and Commonwealth of Pennsylvania located at _____, which parcel of land is commonly identified as Lehigh County Tax Parcel ID No. _____ (the **"Subject Premises"**) upon which Declarant proposes to construct _____as shown on the plan

entitled _____, prepared by_____ dated _____, last revised _____ (hereinafter referred to as "**Subdivision**" or "**Plan**", Exhibit "A" hereto); and

WHEREAS, the Declarant proposes to locate, construct, install and maintain certain Stormwater Management Facilities, as hereinafter defined, on the Subject Premises, as shown on the Plan and as described on Exhibit A attached hereto and made a part hereof; and

WHEREAS, the Township and the Declarant agree that the health, safety, and welfare of the residents of the Township and the protection and maintenance of water quality require that on-site stormwater-related Best Management Practices also be constructed and maintained on the Subject Premises as outlined on the Plan and within this Declaration; and

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

- Structural BMPs – Best Management Practices (**"BMP"**) facilities and structures used to manage stormwater impacts from land development, to protect and maintain water quality and groundwater recharge and to otherwise meet the purposes of the Township's Stormwater Management Ordinance, including but not limited to infiltration trenches, infiltration chambers, seepage pits, filter strips, bioretention, wet ponds, permeable paving, rain gardens, revegetated forests, grassed swales, forested buffers, amended soils, sand filters and detention basins.
- Infiltration Trench – A BMP surface structure designed, constructed, and maintained for the purpose of providing infiltration or recharge of stormwater into the soil and/or groundwater aquifer.
- Infiltration Chamber – A BMP subsurface structure designed, constructed, and maintained for the purpose of providing infiltration or recharge of stormwater into the soil and/or groundwater aquifer.
- Seepage Pit – An underground BMP structure designed, constructed, and maintained for the purpose of providing infiltration or recharge of stormwater into the soil and/or groundwater aquifer.
- Rain Garden – A BMP overlain with appropriate mulch and suitable vegetation designed, constructed, and maintained for the purpose of providing infiltration or recharge of stormwater into the soil and/or underground aquifer.

- Amended Soils – Specially prepared soils placed on the surface of the ground to enhance stormwater absorption.

WHEREAS, as a condition of approval of the Plan, the Township requires that the Stormwater Management Facilities be constructed and adequately operated and maintained by the Declarant, its successors and assigns, as outlined on the Plan and within this Declaration.

NOW THEREFORE, in consideration of the Township's approval of the Plan and other good and valuable consideration, including issuance of building permits for the improvements shown on the Plan following the Township's approval of the applications therefore, the Declarant, on its own behalf, and on behalf of its successors and assigns, including all future owners of the Subject Premises and/or any portion thereof upon which Stormwater Management Facilities are located (collectively, including the Declarant, referred to herein as **"Owner"**), hereby covenants, promises and agrees to and with the Township, its successors and assigns, to faithfully perform all the requirements set forth hereinafter, and does hereby bind the Declarant, the Owner, and the Subject Premises, to the faithful performance of said requirements, to wit:

1. The Owner of the Subject Premises or any portion thereof on which Stormwater Management Facilities are located shall continually and perpetually perform such maintenance, repair, refurbishment, reconstruction, and replacement of the stormwater management facilities, including but not limited to: Structural BMPs, drainage swales, detention and retention basins, rain gardens, wetlands, plantings, stormwater piping systems, headwalls, revegetated forests, amended soils, infiltration trenches, infiltration chambers, seepage pits, inlet and outlet structures, and all structures and facilities appurtenant to the foregoing (the **"Stormwater Management Facilities"**), shown on the Plan (more specifically on the approved Post-Construction Stormwater Management Plan and related documents ["**PCSM**"], a copy of which is attached as Exhibit "B" hereto) and located on the lands of the Owner, in accordance with any specific maintenance requirements set forth on the Plan, and as may otherwise be necessary or advisable in the reasonable opinion of the Township to ensure the structural integrity and the proper functioning thereof, and to assure compliance with all federal, state and local laws, rules, and regulations pertaining thereto. **At no time shall the Stormwater Management Facilities be removed or altered in any manner without the prior written approval of the Township.** Further, the Declarant agrees, on behalf of itself and all future Owners, his/her/their heirs, administrators, executors, assigns, and any other successors in interest, that any construction or

maintenance activities performed on the Subject Premises shall only be permitted during the hours of 7:00 am through 7:00 pm of the same day. No work of any kind is permitted from 7:00 pm through 7:00 am the next morning without the express written consent of the Township, except in the event of an emergency which immediately threatens life or property.

2. All Stormwater Management Facilities, and erosion and sedimentation control facilities, which, because of construction activities, grading, stripping of vegetation, or any other reason, have been damaged or fail to function properly, shall be stabilized and reconstructed by the Owner to approved design grades and specifications. Areas designated with amended soils shall not be disturbed. Revegetated forest areas shall be maintained free of structures and shall not be disturbed.

3. All drainage, detention and/or retention basin easements shown on the Plan shall be maintained in a grassed or otherwise improved condition, in accordance with the grades and designs shown on the Plan. All of these easements shall be kept free of all obstructions not required for their proper functioning, including but not limited to, fill, temporary or permanent structures, and plantings (other than grass or other ground cover).

4. Whenever sedimentation is caused by stripping vegetation, grading or other earth moving activities, it shall be the responsibility of the Owner to remove the sedimentation from all adjoining surfaces and Stormwater Management Facilities, and to repair any damage at the sole expense of the Owner.

5. Inspections.

a. For all Stormwater Management Facilities approved for the Subject Premises, which include but are not limited to underground stormwater retention, detention or discharge structures, Owner hereby agrees to inspect such Stormwater Management Facilities in accordance with the provisions of this Paragraph 5.

b. The inspections shall be performed by a professional engineer (who shall not be affiliated with the Owner) registered to practice in the Commonwealth of Pennsylvania, in good standing, and qualified by training and experience in the design, construction, operation, inspection, and maintenance of Stormwater Management Facilities (herein, "**Professional Engineer**"). If at any point in the future, the Township, DEP, or any other regulatory body provides certification of

individuals or entities which inspect Stormwater Management Facilities, then the Owner shall engage such certified individuals and/or entities to inspect the Stormwater Management Facilities as required hereby.

c. The inspections shall be performed at the following intervals or frequencies, at minimum, during or immediately following precipitation events to ensure that the Stormwater Management Facilities function as intended:

1) For the first five (5) years after the Stormwater Management Facilities are placed in operation, the inspections shall be performed annually not later than May 15 of each year; and

2) Thereafter, the inspections shall be performed every three (3) years not later than May 15 of such third (3rd) year; and

3) Inspections shall also be performed during or immediately after the cessation of any storm with a recurrence interval of ten (10) years or greater.

d. In order to satisfy the Township's obligations under the NPDES MS4 Permit, after each inspection a written inspection report shall be created to document the inspection and provided to the Township (the "**MS4 Report**"). The MS4 Report shall be issued by a Professional Engineer and shall include:

1) The dates and time of the inspection(s);

2) The individual(s) who performed the inspection;

3) A comprehensive list of all PCSM BMPs and Stormwater Management Facilities that were required for the Subdivision;

4) The location of the PCSM BMPs and Stormwater Management Facilities that were inspected;

5) The installation date for each PCSM BMP (month and year);

6) Observations on the performance of each of the PCSM BMPs and Stormwater Management Facilities;

7) A statement indicating that the operation and maintenance checks have been performed for each PCSM BMP listed;

8) Recommendations for improving the performance of the PCSM BMPs and Stormwater Management Facilities, if applicable; and

9) A certification that the Stormwater Management Facilities are functioning as designed.

10) If the Stormwater Management Facilities are not functioning as designed, then the MS4 Report shall also include recommendations of corrective measures or repairs required to correct the deficiencies.

e. The Owner shall submit the MS4 Report required hereunder to the Township within 30 days following completion of any required inspection, in perpetuity. If Owner fails to provide the necessary MS4 Report, the Township shall have the right to report such failure for the Subdivision in the Township's MS4 Report to DEP, and the Township expressly reserves all other rights and remedies.

f. The Owner further agrees to comply with the inspection requirements that may be enacted, ordained, promulgated, or otherwise required in the future by the Township, DEP, or any other governmental agency having jurisdiction over Stormwater Management Facilities.

6. Corrective Measures and Repairs.

a. If the MS4 Report finds that cleaning of the Stormwater Management Facilities is required by removing any debris or other material from them, then the material removed must be disposed of at a Pennsylvania Department of Environmental Protection (**"DEP"**) permitted landfill or some other facility approved by DEP for the handling of such material. **The Owner is specifically prohibited from flushing any debris or other material out of the Stormwater Management Facilities onto any location outside of the Subject Premises or into any public stormwater system.**

b. If the MS4 finds or recommends corrective measures or repairs, then:

1) The Owner shall prepare all required specifications and contracts for such corrective measures within ninety (90) days of the identification of deficiencies in the MS4 Report.

2) If the Owner must bid the work, the request for bids must be advertised within ninety (90) days after the MS4 Report.

3) Copies of the request for bid documents and a summary of the results of the bids shall be delivered to the Township within 10 days after their issuance or opening, respectively.

4) Thereafter, all necessary corrective measures and repairs shall be completed by Owner within one hundred fifty (150) days after the MS4 Report, unless another specific period is authorized by Township.

5) If the Owner makes a reasonable request for an extension of time to prepare specifications, contracts, advertise if bidding is required, accept bids, and/or complete the corrective measures and repairs, then the Township shall grant an extension of time pursuant to the Owner's request.

6) Within 30 days after the completion of the corrective measures and repairs, the Owner shall submit to the Township a supplemental MS4 Report, limited to the corrective measures and repairs, which shall include a Professional Engineer's certification that the corrective measures and repairs have been properly completed.

c. In the event that any routine maintenance work is performed periodically by the Owner, then within 30 days after completion of such maintenance work Owner shall submit information concerning the maintenance work to the Township, including details concerning the maintenance work which took place. The Township shall have the right to require the Owner to submit to the Township a supplemental MS4 Report, limited to the maintenance work, issued by a Professional Engineer which certifies that the Stormwater Management Facilities that were the subject of the maintenance work are functioning as designed following the maintenance work undertaken by Owner. The supplemental MS4 report shall be submitted to the Township within 30 days after the Township's request for same.

7. The Owner hereby agrees to comply with the provisions of Township Ordinances adopted pursuant to Act 167 of 1978 (the Stormwater Management Act), as amended, all regulations promulgated by the DEP for the NPDES MS4 program, provisions of the Commonwealth of Pennsylvania's Clean Streams Law, and the United States Clean Water Act.

This obligation of Owner shall apply to any requirement found in any applicable regulation, including those imposed upon the Township relative to the Owner's private, on-site Stormwater Management Facilities. Stated another way, the Owner is responsible for compliance with all regulations for Stormwater Management Facilities on the Subject Premises even if the regulation(s) nominally imposes obligations on the Township and not the Owner.

8. The Owner shall make provision and be personally responsible for strict compliance with all of the covenants outlined within this Declaration. Upon failure of the Owner to comply within the time period specified by written notice (which notice shall be no less than sixty (60) days) after receipt from the Township, then the Township may declare that remedial work is necessary. In the event the Township determines remedial work to be of an emergency nature, and in the event Owner is unable to commence the remedial work within a reasonable period of time based on the nature and scope of the emergency, then and only then shall the Township have the right (but not the duty) to perform such work as may be necessary in its sole and absolute discretion to bring the Owner into compliance at Owner's expense, or to otherwise cure any default by Owner of its obligations hereunder, and to include a ten percent (10%) surcharge to Owner for the Township's administrative expenses, plus any costs expended by the Township if suit in assumpsit or equity is filed, which expenses the Owner hereby agrees to assume and pay. It is expressly understood and agreed that the Township is under no obligation to maintain or repair any Stormwater Management Facilities on the Subject Premises, and, in no event shall this document be construed to impose any such obligation upon the Township.

9. In the event that the Owner fails or refuses to provide the MS4 Report or take any corrective measures as described in Paragraph 6 above, or fails or refuses to pay all sums due to Township remedial work as described in Paragraph 8 above, within thirty (30) days of demand therefore, and Township chooses to collect same, then the Township is hereby expressly authorized to do so in the manner prescribed by law. The Township may file and collect a municipal claim and municipal lien against the property where the Stormwater Management Facilities are located, the Subject Premises, and/ or any property which is served by or discharges stormwater to the Stormwater Management Facilities, to recover any costs, expenses, and fees, including without limitation, for repair, maintenance, corrective measures as described in Paragraph 6 above, remedial work as described in paragraph 8 above, inspection and administrative fees, attorney fees, and technical expert fees, that the Township incurs relating to

such failure or refusal by the Owner, in accordance with the Municipal Claims and Tax Liens law (53 P.S. Chapter 25, § 7101 *et seq.*, as amended), particularly § **7107. Entitlement to Liens for Taxes, Removal of Nuisances, Grading, Paving; Assignment by Municipal Authority; Claim to Use of Contractor.**

10. The Declarant hereby grants, bargains and conveys to the Township, its successors and assigns, the Township Engineer, and such other persons as may be authorized by them to act on their behalf: (a) a non-exclusive right-of-way and easement on, over, across, under and through the Subject Premises for the sole purposes of inspecting the Stormwater Management Facilities, of curing any default by the Owner, and of exercising its rights under this Declaration; and (b) the free and uninterrupted use, liberty, and privilege of, and passage in and along, and to and from the Subject Premises to the nearest public roadway for the foregoing purposes.

Reserving unto Declarant and the future Owner, its/his/her/their heirs, executors, administrators, successors and assigns, the right to use and enjoy the surface of the Subject Premises which are the subject of this Declaration for any lawful purpose; provided that such use and enjoyment shall not infringe upon, damage or obstruct the operations or maintenance of Stormwater Management Facilities installed or to be installed in or upon the Subject Premises, nor compact or compromise areas containing amended soils; and further provided that neither the future Owner nor Declarant shall have the right to change the grade of those portions of the surface of the Subject Premises over which storm water is, or is to be, conveyed without prior written approval of the Township. Revegetated forest areas shall be maintained free of structures and shall not be disturbed.

To have and to hold all and singular the aforesaid easement, rights and privileges hereby granted or mentioned and intended so to be, with the appurtenances, unto Declarant, Owner, and Township, their successors and assigns, to and for only the proper use and benefit of Declarant, Owner, Township, and its/his/her/their heirs, executors, administrators, agents, successors and assigns, forever, as their interests shall appear.

11. The Township, its successors and assigns, is also expressly granted the right and privilege, but not the duty, to enter upon the Subject Premises in accordance with its rights as herein granted to apply larvicides for mosquito control related to the Stormwater Management Facilities. Application of larvicides shall be done only by a licensed applicator. Prior to

application, the Township shall provide Owner at least twenty-four (24) hours prior notice and further agrees that mosquito control will occur at an agreed upon time of day to avoid any conflict with outdoor activities conducted by the Owner on the Subject Premises.

12. The Owner shall be responsible for preparing and submitting all required plans and documents and performing all work of any kind whatsoever as may be necessary or advisable to obtain approval of a "Notice of Termination" ("**NOT**") of the NPDES construction permit and PCSM Plan for the Subdivision. In the event the Owner fails or refuses to fulfill this covenant, then the Township may (but shall not be required to) utilize the measures set forth in Paragraphs 8 and 9 hereof to cure any such failure or refusal.

13. The Declarant, for itself, the future Owner, and its/their/his/her heirs, executors, administrators, assigns, and other successors in interest hereby release, agree to indemnify, defend, exonerate and hold harmless (through legal counsel of the Township's choice) the Township, its Board of Commissioners, committees and commissions (including the individual members thereof), their elected and appointed officers and officials, and their respective managers, representatives, advisors, insurers, engineers, solicitors, other professional consultants, appointees, employees, agents, independent contractors, predecessors, successors, and assigns (collectively, the "**Township Representatives**") of and from all claims, cross claims, counter claims, lawsuits, proceedings, actions, disputes, causes and rights of action, debts, controversies, judgments, expenses, assessments, awards, attachments, executions, liens, losses, allegations, demands, penalties, charges, fines, fees, injuries, costs (including, without limitation, attorneys' fees and other costs and expenses incurred, including expert witness fees), damages, (including, without limitation, compensatory, consequential and punitive damages), sanctions, accidents, casualties, occurrences and/or liabilities of every kind, character and manner whatsoever, in law or in equity, civil or criminal, administrative or judicial, contract, tort (including without limitation negligence of any kind,) or otherwise which might arise or be asserted against the Township and the Township Representatives (unless caused by the negligence of the Township or the Township Representatives) pertaining to, relating to, resulting from, caused by, sustained in connection with, based upon or arising out of: (i) any failure of the Owner(s) to perform or observe any term, provision, covenant or condition of this Declaration; (ii) any material inaccuracy and/or any misrepresentation or breach of warranty (expressed or implied) made by the Owner or its employees, consultants, partners, contractors, subcontractors,

agents, representatives, suppliers, licensees, or invitees; (iii) any injury (including but not limited to death) or damage to any person, entity or property from a cause arising out of, resulting from, caused by or relating to the design, installation, construction, maintenance (or lack thereof), quality of or failure of the Stormwater Management Facilities and/or any work performed at the Subject Premises or land of others and any condition created by the aforesaid design, installation, construction, maintenance (or lack thereof), etc., of the Stormwater Management Facilities; or (iv) any discharge of surface water onto land of others from and through the Subject Premises and other areas encompassed by the Plan and/or this Declaration. In the event that a claim is asserted against the Township and/or Township Representatives, the Township shall promptly notify the Owner and Owner shall defend at its/his/her/their own expense, any suit based on the claim, unless caused by the negligence of the Township or the Township Representatives. If any judgment or claims against the Township and/or the Township Representatives shall be allowed, Owner shall pay all costs and expenses regarding said judgment or claim, unless caused by the negligence of the Township or the Township Representatives.

14. The covenants and conditions set forth herein shall inure to the benefit of and shall be enforceable by Declarant, future Owner, Township and each of them, and its/his/her/their respective heirs, executors, administrators, successors and assigns.

15. This Declaration may not be amended without the express written consent of the Township. This Declaration shall be recorded at the Office of the Clerk of Judicial Records - Recorder of Deeds Division for Lehigh County, Pennsylvania at the cost of the Declarant, and shall constitute a covenant running with the Subject Premises and/or equitable servitude, and shall be binding on the Owner, his/her/their heirs, administrators, executors, assigns, and any other successors in interest, in perpetuity.

16. All of the "Whereas" recital clauses at the beginning of this Declaration are accurate, incorporated herein by reference, and do form an integral part of this Declaration.

17. The Declarant, on behalf of itself, and its successors and assigns, including all Owner(s), agrees that the rule of interpretation that, in the event of any ambiguity or issue of construction, the same will be resolved against the drafter of the document is hereby waived. It is declared to be the intention of the Owner and the Township that the public health, safety and welfare be protected and furthered by this Declaration, that it be interpreted in such manner as to favor such public interest as opposed to any private interest and that any ambiguity or issue of

construction shall be resolved in favor of ensuring the proper inspection, maintenance and operation of the Stormwater Management Facilities. This Declaration of the Declarant is intended to and shall be interpreted as imposing obligations upon the Declarant and the other parties constituting the Owner which may be supplemental to and in addition to those obligations recited in the Plan and land development law.

IN WITNESS WHEREOF, and intending to be legally bound hereby, the Declarant and the Township have executed this Declaration of Covenants and Easement for Maintenance of Stormwater Management Facilities the day and year first above written.

TOWNSHIP OF SOUTH WHITEHALL

By: _____

[TOWNSHIP SEAL]

Attest: _____
_____, Secretary

DECLARANT/OWNER

By: _____

[CORPORATE SEAL]

Attest: _____
Name, (Assistant) Secretary

COMMONWEALTH OF PENNSYLVANIA :
: ss.
COUNTY OF LEHIGH :

On this __ day of _____, 20____, before me, a notary public, the undersigned officer, personally appeared _____, who acknowledged himself/herself to be the Township Manager of SOUTH WHITEHALL TOWNSHIP, a municipal corporation, and that he/she as the Township Manager, being authorized to do so, executed the foregoing instrument for the purposes therein contained by signing the name of the Township by himself/herself as the Township Manager.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

_____
Notary Public

COMMONWEALTH OF PENNSYLVANIA
:ss.
COUNTY OF _____

On this __ day of _____, 20____, before me, a Notary Public, the undersigned officer, personally appeared _____, who acknowledged himself/herself to be the_____, and that he/she as such _____, being authorized to do so, executed the foregoing instrument for the purpose therein contained by signing the name of _____ by himself/herself as the _____.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

_____
Notary Public

EXHIBIT "A"
(Subdivision or Plan sheets)

EXHIBIT "B"
(Post-Construction Stormwater Management Plan "PCSM" sheets and related documents)

APPENDIX F

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 may lead 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.** Depression 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 building setbacks reduces driveway and entry walks and is most readily accomplished along low-traffic streets where traffic noise is not a problem.

- **Constructing 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.

APPENDIX G

PRELIMINARY SITE INVESTIGATION AND TESTING REQUIRMENTS

Required Data and Site Information: The following data shall be gathered utilizing standard testing procedures as part of a Preliminary Site Investigation:

- Bedrock composition – Any apparent boundaries between carbonate and non-carbonate bedrock must be verified by a qualified geotechnical professional.
- Bedrock structural geology – This includes the possible presence of faults and mapping of conspicuous fracture traces or lineaments.
- Overburden and soil mantle composition and thickness
- Permeability of the soil
- Depth to the seasonal high water table
- Presence of special geologic features – This includes sinkholes, closed depressions, fracture traces, lineaments, joints, faults, caves , pinacles and geologic contacts between carbonate and non-carbonate bedrock

Preliminary Site Investigation Required for Sites Intending to Use Infiltration

Review of Available Data, Maps and Reports: Some of the required information, as listed above, can be found in existing published data. Suggested resources include the following:

- Geologic maps and references for the development area
- The Little Lehigh Creek Basin Carbonate Prototype Area Closed Depression Map – available at the LVPC
- USGS topographic maps
- Lehigh and Northampton County soil survey maps
- Aerial photographs from the LVPC or other sources
- Relevant Pennsylvania Geologic Survey Open File Reports that provide maps of sinkholes and Karst features for Lehigh County (OF 87-01) and Northampton County (OF 87-02)
- Kochanov and Reese (2003). Density of Mapped Karst Feature in South-Central and Southeastern Pennsylvania (Map 68)
- DCNR Online Sinkhole Inventory - (http://www.dcnr.state.pa.us/topogeo/hazards/sinkhole/default.asp)

Field Inspections: In addition to gathering data from published sources, a field inspection of the proposed site is required. A field inspection can provide additional information relating to site features such as carbonate bedrock features, indicators of seasonal high stream-level or water table levels, streams, springs, etc.

Soil Test Pit and Percolation Test Requirements: A minimum of one test pit and a minimum of 2 percolation tests are required for every site. A test pit is a 2-3 foot wide, 8 to 12 foot deep trench excavated with a backhoe for observing subsurface conditions. The test pits will be used to describe soil depth and quality, including soil horizons, and

testing of permeability or percolation rates and can be conducted by a certified Sewage Enforcement Officer.

Percolation tests are to be conducted as follows (adapted from § 73.15. "Percolation Tests" of the Pennsylvania Code)

1. The percolation tests shall be made in separate holes uniformly spaced over the possible infiltration area.

2. An "Initial Presoak" should not be performed.

3. Percolation holes located within the possible infiltration area shall be used in the calculation of the average percolation rate.

4. Holes having a uniform diameter of 6 to 10-inches shall be bored or dug as follows:
   a. To the depth of the bottom of the possible infiltration BMP
   b. Alternate depths if the test pits/auger holes indicate that the soils are more suitable at a different depth (i.e., if a clay horizon is identified and more suitable soils are located beneath the horizon, and infiltration test should be performed in the suitable horizon).

5. The bottom and sides of the hole shall be scarified with a knife blade or sharp-pointed instrument to completely remove any smeared soil surfaces and to provide a natural soil interface into which water may percolate. Loose material shall be removed from the hole. Two inches of coarse sand or fine gravel shall be placed in the bottom of the hole to protect the soil from scouring and clogging of the pores.

6. Immediately before the percolation test, as a final presoak, water shall be placed in the hole to a minimum depth of 6-inches over the gravel and readjusted every 30 minutes for 1 hour.

7. The drop in the water level during the last 30 minutes of the final presoaking period shall be applied to the following standard to determine the time interval between readings for each percolation hole:
   a. If water remains in the hole, the interval for readings during the percolation test shall be 30 minutes.
   b. If no water remains in the hole, the interval for readings during the percolation test may be reduced to 10 minutes.

8. After the final presoaking period, water in the hole shall again be adjusted to approximately 6-inches over the gravel and readjusted when necessary after each reading.
   a. Measurement to the water level in the individual percolation holes shall be made from a fixed reference point and shall continue at the

interval determined from step No. 7 (above) for each individual percolation hole until a minimum of eight readings are completed or until a stabilized rate of drop is obtained, whichever occurs first. A stabilized rate of drop means a difference of ¼-inch or less of drop between the highest and lowest readings of four consecutive readings.

b. The drop that occurs in the final period in percolation test holes, expressed as inches per hour, shall be used to calculate the average percolation rate.

c. When the rate of drop in a percolation test is too slow to obtain a measurable rate, the rate of 0.25 inches per hour shall be assigned to that hole for use in calculating the average percolation rate. The infiltration area may be placed over holes with no measurable rate when the average percolation rate for the possible infiltration area is within the acceptable range.

When a percolation test hole yields a percolation rate of greater than 12-inches per hour, the proposed infiltration area may not be designed or installed within 25-feet of this hole unless the municipality determines that a testing anomaly caused the fast percolation rate and a retest of the area yields acceptable percolation rates. This percolation rate limit is established to protect groundwater quality and to minimize the risk of subsidence.

Additional Site Investigation and Testing Required if Infiltration is Proposed

Soil Test Pit Requirements: The required number of test pits varies with Effective Soil Thickness. As risk factors increase, the number of test pits increases. A minimum of 2 test pits, uniformly spaced within the proposed infiltration area (e.g. the 2 pits should be centered on each half of the proposed infiltration area), are required for any site proposing infiltration unless the applicant can demonstrate that one test pit is adequately representative of the area proposed for infiltration. For larger infiltration areas, multiple test pits shall be developed at the densities as listed below:

Effective Soil Thickness (ft.)	Test Pit Density (per acre of proposed infiltration area)*	Percolation Tests (per acre of proposed infiltration area)**	Auger Grid Spacing (Feet On-Center)***
8	4	8	50
4 to 8	6	12	35
2 to 4	8	16	25

*No. of Test Pits required = Infiltration sq. ft./43,560 sq. ft. x test pit density from chart rounded up to the nearest whole number

** No. of Percolation Tests required = Infiltration sq. ft./43,560 sq. ft. x percolation tests from chart rounded up to the nearest whole number

***Auger testing is only required on Carbonate sites.

Soil Auger Testing Requirements for Carbonate Areas: Because soil depth is not uniform in many carbonate areas, test pits will not be sufficient to accurately determine the depth to bedrock. Augering provides this essential data as inexpensively as possible. Truck or track mounted rig with hollow or solid stem augers allows relatively

inexpensive, qualitative determination of the presence of overburden voids and will generally penetrate to the top-of-bedrock. Augers typically extend to depths of 20 feet. Special augers extend to as much as 50 feet. Augers do not extend into the bedrock. Auger testing should be performed in a grid pattern across the proposed infiltration area, spaced as indicated in the above table.

Percolation Testing Requirements: For each proposed infiltration area, a minimum of six percolation tests shall be conducted unless the applicant can demonstrate that fewer tests accurately represent the percolation rate of the proposed infiltration area. Additional testing shall be required if the initial test results show significant variability. For larger infiltration areas, percolation tests shall be conducted at the densities listed in the table above.

SOUTH WHITEHALL TOWNSHIP

MEMORANDUM FOR AGENDA ITEMS

TO:	Board of Commissioners
FROM:	David Manhardt
DATE:	8/12/2022
SUBJECT:	Sidewalk Deferral Call-in Policy

- **Background Information:**

  A sidewalk deferral is decision recommended by the South Whitehall Township Planning Commission and granted by the Board of Commissioners. It allows land development (which includes subdivisions) applicants to temporarily delay sidewalk construction until a future time as decided upon by the Board of Commissioners. A deferral differs from a waiver, which is a permanent decision made by the BOC to not require sidewalks as a part a land development.

  South Whitehall Township requires that land development projects construct sidewalks along all public streets, private ways, and within all subdivisions as a part of Its Subdivision and Land Development Ordinance (SALDO) Section 312-35(b)(3)(A)(ii)(1)(A). In special circumstances, the Township has granted applicants deferrals to this ordinance. When opportunities present themselves, "calling-in" a sidewalk deferral can fill gaps in the sidewalk network. This document acts as a guide to the "call-in" process and informs readers of the necessary steps for calling-in sidewalks in South Whitehall Township.

  The attached policy was brought to the Board at the June 1,2022 meeting. At the June 1st meeting "A MOTION was made by Commissioner Hodges, which was seconded by Commissioner Osborne, to TABLE this motion in order that Staff can come back to the Board with a formal Policy regarding the sidewalk-deferral process." The attached Policy has since been reviewed by Zator Law Offices and recommend changes have been incorporated.

- **Attachments:**
  - Sidewalk Deferral Policy
  - Resolution

TOWNSHIP OF SOUTH WHITEHALL
LEHIGH COUNTY, PENNSYLVANIA

RESOLUTION NO. 2022-__
(Duly Adopted August 17, 2022)

A RESOLUTION TO ADOPT THE "SIDEWALK DEFERRAL CALL-IN POLICY" FOR SOUTH WHITEHALL TOWNSHIP

WHEREAS, South Whitehall Township requires that land development projects construct sidewalks along all public streets, private ways, and within all subdivisions as part of its Subdivision and Land Development Ordinance; and,

WHEREAS, in special circumstances, the Township has granted applicants deferrals to this requirement, allowing the applicant to refrain from installing sidewalk as part of the land development but retaining for the Township the right to require the construction of the sidewalk at a future time at the direction of the Board of Commissioners; and,

WHEREAS, when opportunities present themselves, "calling-in" a sidewalk deferral can fill gaps in the sidewalk network, but there has been no established procedure to do so; and,

WHEREAS, the "Sidewalk Deferral Call-In Policy" will act as a guide to the "call-in" process and informs what the necessary steps are for calling-in sidewalks in South Whitehall Township.

NOW, THEREFORE BE IT RESOLVED by the Board of Commissioners of South Whitehall Township that the document attached hereto marked as "Exhibit A" is hereby adopted and approved. The Board of Commissioners reserves the right to amend or revise said "Sidewalk Deferral Call-In Policy" should the need arise.

DULY ADOPTED this **17th** day of **August 2022**, by the Board of Commissioners of the Township of South Whitehall, Lehigh County, Pennsylvania, in lawful session duly assembled.

TOWNSHIP OF SOUTH WHITEHALL
BOARD OF COMMISSIONERS

_____
Diane Kelly, President

ATTEST:

_____
Monica Hodges, Assist. Secretary

Sidewalk Deferral Call-in Policy

South Whitehall Township

~~June 7, 2022~~ ZLO Proposed Edits 07.11.2022

Introduction

What is a deferral?

A sidewalk deferral is decision recommended by the South Whitehall Township Planning Commission and granted by the Board of Commissioners. It allows land development (which includes subdivisions) applicants to temporarily delay sidewalk construction until a future time as decided upon by the Board of Commissioners. A deferral differs from a waiver, which is a permanent decision made by the BOC to not require sidewalks as a part a land development.

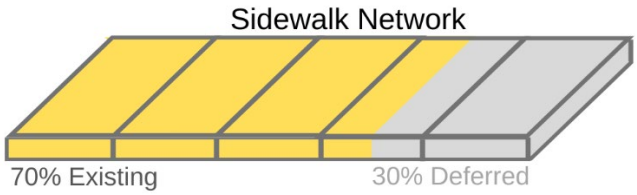
South Whitehall Township requires that land development projects construct sidewalks along all public streets, private ways, and within all subdivisions as a part of Its Subdivision and Land Development Ordinance (SALDO) Section 312-35(b)(3)(A)(ii)(1)(A). In special circumstances, the Township has granted applicants deferrals to this ordinance**.** When opportunities present themselves, “calling-in” a sidewalk deferral can fill gaps in the sidewalk network. This document acts as a guide to the “call-in” process and informs readers of the necessary steps for calling-in sidewalks in South Whitehall Township.

How many deferrals are there?

There are 22 miles of deferred sidewalk in South Whitehall Township.

Sidewalk construction has been deferred on roughly 100 Land Development Projects since 1993.

22 miles
Deferred



Procedure

1. Initial Request/Recommendation
   Generally, sidewalk deferrals are called in to fill important gaps and/or to coordinate with new sidewalk construction. Calling in a deferral can start with a request from Township staff, Township Boards/Commissions/Committees, an outside agency, developers, or the public. Individual project deferrals can be grouped together to construct a larger section of sidewalk that more effectively adds to the sidewalk network.

2. Prepare Background
   Township staff will prepare a packet regarding the property(s) subject to the call-in. The packet will include the requesting entity, the deferral resolution(s), approved plan(s), right of way or easement status (see 9 below), and location map. The location map will show the location of the deferral(s) being discussed, as well as nearby adjacent deferrals and existing sidewalks.

3. Notify Property Owners
   Property owners subject to deferral call-in(s) will be notified their call-in(s) are on a BOC Agenda for discussion and will be invited to attend the meeting.

4. Present to BOC for Direction
   Township staff will present a memo that explains the initial request, as well as the background packet. Following the staff presentation and courtesy of the floor, the BOC will decide whether to pursue the recommended call-in. If the BOC chooses not to pursue the call in at this time, the present call-in process will end here (but not permanently). If the BOC decides to pursue a call-in, a motion will be made directing Township staff to draft a resolution regarding the specific call-in(s).

5. Prepare Resolution
   The resolution will include details unique to the property, the deadline to install sidewalks (12-24 months), and act as a closing response to the initial deferral granted by the BOC. Another notice of the pending Resolution will be given to the property owners.

6. Formal Notification
   If the BOC approves the resolution, Township staff will send an official notice to the affected property owner(s). The notice will include all of the background information gathered and the resolution adopted by the BOC. The Resolution will also be recorded in the Lehigh County Recorder of Deeds Division [subject to confirmation with that office] to insert the Resolution into the ‘chain of title’ for the property so future owners will be aware of this obligation. The letter recipient will have 30-days to acknowledge receipt of the letter, failure to do so will result in further action outlined in the next step.

7. Notification Enforcement
   If the property owner(s) fails to respond to the letter within 30 days, a follow-up letter will be sent. The recipient will have 15 days to respond to the follow up letter. If the property owner(s) fail to comply with the second letter, Township Staff will go to the BOC for further direction.

8. Sidewalk Design and Construction

If an escrow is not already in place, the first step will be the execution of a Professional Service Agreement with the property owner(s). Township Staff will then hold meetings between the property owner(s) and the Township Engineer. Specific plan details and issues regarding sidewalk construction, including but not limited to frontage improvements and Right of Way dedication, will be discussed during this step. The results of the meetings between the Township Engineer and the property owner(s) will be plans and a schedule for construction of the project. The schedule will establish 'milestones' for key actions to implement the 'call-in', and take into account winter weather and other appropriate factors (such as other permits needed, outside agency approvals, utility relocations, etc.) without unnecessary delays. For larger projects with an estimated cost over $10,000 [amount subject to review], when the property owner has been uncooperative, where there are doubts about the property owner's ability to finance the construction, or when there are other circumstances justifying it, the staff is authorized to require the property owner to enter into the Township's standard subdivision improvements agreement and post financial security, insurance, inspection fees, etc. to assure the sidewalk will be installed with quality conforming to Township specifications in a timely manner per the approved plans and schedule. Construction can then begin following the conclusion of this step.

9. Right Of Way and Easement Acquisitions.

In certain instances – such as where sidewalk is needed across an older property that predates a subdivision or land development, where insufficient right of way width is available, or when a dedication of right of way has lapsed due the passage of time, etc. – it will be necessary for the Township to obtain the right of way or easement for the sidewalk installation. If that right of way/ easement cannot obtained by either gift, donation, or dedication for a nominal amount, then the Township will have to obtain the right of way by either purchase, condemnation (eminent domain), or other available procedures. As these latter methods will involve formal action by the BOC and expenditure of Township funds, information on the right-of-way status will be provided to the BOC at the "Present to BOC for Direction" step (4 above), updated at the Resolution step (6 above), and if an ordinance will be needed to compel the sidewalk installation (10 below).

10. Compelling Sidewalk Installation by Ordinance.

If a property owner does not cooperate, delays or does not follow the above procedure, or otherwise fails or refuses to comply with the sidewalk call-in process, then sidewalk installation – at the property owner's expense – can be compelled by the Township enacting an ordinance to that effect per the procedures of Sections 2301 and 2303 of the First Class Township Code. This would be an extraordinary method to be used only when all other efforts have not been successful. When that kind of impasse is reached, a request for such an ordinance will be brought to the BOC with supporting information, including details of communications with the property owner and the property owner's responses and actions (or lack thereof). (Depending on the circumstances and needs, the ordinance can be done either for individual properties on a case-by-case basis, for multiple properties along a street or in a subdivision, or for properties scattered throughout the Township.) Section 2303 provides that the Township can specify in the ordinance the type of notice to be given to the property owner. If the property owner or fails or refuses to install the sidewalk within the time specified in the ordinance and notice, then the Township can install the sidewalk. (This would mean the Township potentially engineering the sidewalk; creating, financing, bidding,

and awarding a construction contract; and managing a contractor to actually perform the work, etc.). If the property owner fails or refuses to reimburse the Township for the costs of the sidewalk, then the Township can file a lien against the property for those costs and proceed to collect that amount as provided by law for liens.

SOUTH WHITEHALL TOWNSHIP

MEMORANDUM FOR AGENDA ITEMS

TO:	Board of Commissioners
FROM:	Herb Bender
DATE:	August 12, 2022
SUBJECT:	PennDot Land Acquisition
COPY TO:	M.Elias, S.Boehret,

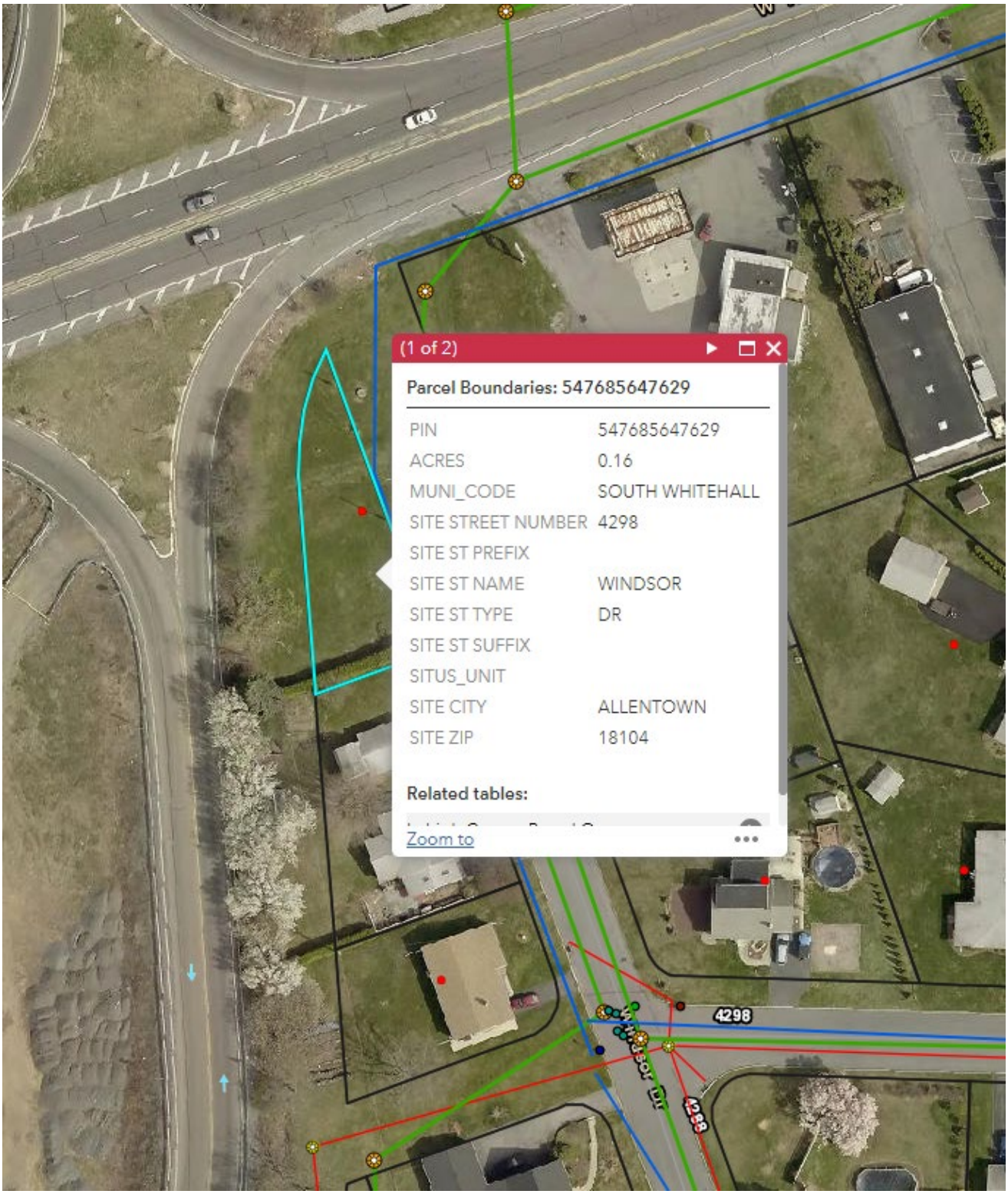
- **Background Information and/or Justification of Expense:**

  This piece of land is located at 4298 Windsor Drive, identified as Lehigh County Parcel ID 547685647629-1. The Pennsylvania Department of Transportation (PennDOT) is seeking to acquire this from South Whitehall Township as part of their Route 309 Interchange Project. PennDOT has offered the Township $104,500.00 for this parcel of land.

- **Action Requested:**

  The Administration is seeking approval from the Board of Commissioners so we can proceed with finalizing this transaction.

- **Budget Line Item (if applicable):**


(1 of 2)
Parcel Boundaries: 547685647629
PIN 547685647629
ACRES 0.16
MUNI_CODE SOUTH WHITEHALL
SITE STREET NUMBER 4298
SITE ST PREFIX
SITE ST NAME WINDSOR
SITE ST TYPE DR
SITE ST SUFFIX
SITUS_UNIT
SITE CITY ALLENTOWN
SITE ZIP 18104
Related tables:
Zoom to
4298
WINDSOR DR
4288

RW-313 (12/18)

pennsylvania
DEPARTMENT OF TRANSPORTATION

ROW OFFICE PROJ NO	050380
COUNTY	Lehigh
S.R. – SECTION	0309-12M
MUNICIPALITY	South Whitehall Township
PARCEL NO.	72
CLAIM NO.	3900813000
CLAIMANT	Township of South Whitehall, a Political Subdivision of the Commonwealth of Pennsylvania

SETTLEMENT STATEMENT

Final Settlement

PROJECTED DISTRIBUTION DATE

Date:

ADDRESS OF CLAIMANT(S)	LOCATION (ADDRESS) OF PROPERTY	CLAIMANT'S ATTORNEY AND ADDRESS
4444 Walbert Avenue Allentown, PA 18104-1619	Deed Book 1081 Page 0388	

Final Settlement		$104,500.00
Commonwealth's Pro-Rata Share of Current Realty Taxes	estimated	$1,567.50
Mortgage Pre-Payment Penalty		$0.00
Mortgage Satisfaction Fee		$0.00
Less Monies Previously Paid	(paid into court)	$0.00
Less Monies Credited for Owner Retained Items		$0.00
Withheld Pending Building Removal by Owner		0
Total Available for Distribution		$106,067.50

CHARGES:

Mortgage(s):		
Mortgagee:	0.00	
Principal:	0.00	
Interest (to date:)	0.00	
Pre-Payment Penalty*:	0.00	
Satisfaction Fee*:	0.00	
Unpaid Current Taxes:		
Claimant(s) Pro-Rata Share	0.00	
Commonwealth's Pro-Rata Share*	0.00	
TOTAL		0.00
Liens and/or Delinquent Taxes and Municipal Claims:		0.00
Judgment(s):		0.00
TOTAL CHARGES		0

*Paid by Pennsylvania Department of Transportation

Minus Total Charges	$0.00
Balance Due Claimant(s)	$106,067.50

The distribution of funds as shown on the reverse hereof is approved and the "Balance Due Claimant(s)" is acknowledged to be correct. I hereby acknowledge receipt of a copy of this settlement statement.

INDIVIDUALS

_____

_____

_____

_____

_____

_____

ENTITIES*

GRANTOR:
Township of South Whitehall, a Political
(Name of Entity)

BY:_____

BY:_____

* Use this block for a corporation, partnership, LLC, government entity, school district, church, trust, club, association, POA, attorney-in-fact, executor, administrator or any other entity. See R/W Manual Section 3.06.

I Hereby Certify That The Information On This Form Is True And Correct, According To The Records Of The Pennsylvania Department of Transportation.

_____
Signature

Right-of-Way Agent
Title

Date -

RW-317AF (9/20)
18-FA-50.1

pennsylvania
DEPARTMENT OF TRANSPORTATION

ROW OFFICE PROJ. NO.	050380
COUNTY	Lehigh
S.R. - SECTION	0309-12M
MUNICIPALITY	South Whitehall Township
PARCEL NO.	72
CLAIM NO.	3900813000
CLAIMANT	Township of South Whitehall, a Political Subdivision of the Commonwealth of Pennsylvania

AGREEMENT OF SALE
(Fee Simple)

THIS AGREEMENT OF SALE ("Agreement") is made this ____ day of_____, by Township of South Whitehall, a Political Subdivision of the Commonwealth of Pennsylvania, 4444 Walbert Avenue, Allentown, PA 18104-1619, owner(s) of property affected by the construction or improvement of the above referenced State Route, its heirs, executors, administrators, successors and/or assigns ("SELLER"), and the Commonwealth of Pennsylvania, through Department of Transportation ("COMMONWEALTH").

W I T N E S S E T H:

WHEREAS, the COMMONWEALTH recorded a plan in the Recorder of Deeds Office of the aforesaid County indicating its authorization to condemn SELLER's property for transportation construction or improvement on the above referenced State Route and Section; and

WHEREAS, the parties have agreed that, in lieu of condemnation, the SELLER will convey in fee simple and such other lesser estate(s) as designated, if any, to the COMMONWEALTH the property or a portion thereof required by the COMMONWEALTH.

NOW, THEREFORE, the parties, intending to be legally bound, agree as follows:

1. **Sale and Conveyance**. The SELLER shall sell and convey to the COMMONWEALTH in fee simple:

☐ the premises described by metes and bounds in Exhibit A which is attached hereto.

☒ that portion of the property designated as required right-of-way or as acquired in fee simple for other purposes on the plot plan which is attached hereto as Exhibit A; and those areas, if any, designated as required for easement purposes as identified in the plot plan.

Being all or a portion of the property conveyed or devised to the SELLER by Deed of Oakleigh Development Co., a Pennsylvania Corporation, dated July 27, 1965 and recorded in Deed Book 1081 Page 0388, together with the improvements, hereditaments, and appurtenances to the property, except those that are identified in Section 3 below to be retained by the SELLER, free and clear of all liens, charges, delinquent taxes and assessments, and of all leases, agreements and other encumbrances that the SELLER has the right to terminate or remove. The SELLER shall assign to the COMMONWEALTH all of the SELLER's right, title and interest in those leases, agreements, and other encumbrances that cannot be terminated or removed. This conveyance contains approximately 7,459 square feet of Required Right-of-Way for Limited Access, and the property is identified on COMMONWEALTH plans as Parcel 71, being part of Tax Map Parcel No. 547685647629.

2. **Warranty**. The SELLER warrants GENERALLY the property interest conveyed.

3. **Reservation**. The SELLER hereby excepts and reserves from this conveyance all right, title and interest in and to all minerals, including oil, gas, subsurface gas storage and subsurface gas storage protection together with the right to produce, inject, store subsurface, withdraw and protect natural gas and oil; said mining, removal, storage and storage protection activities to be accomplished from a minimum depth to be determined by the COMMONWEALTH, from mine shafts, wells or other facilities located off the right-of-way, it being the intent of this provision that the COMMONWEALTH owns the right of support and no mineral activities may take place on the surface of the land acquired by the COMMONWEALTH.

4. **Purchase Price and Expenses**. The COMMONWEALTH shall pay to the SELLER the purchase price of $104,500.00 within ninety (90) days of the date of execution of this Agreement. The COMMONWEALTH shall also pay all expenses of examination of the title and of preparation and recording of the deed.

5. **Risk of Loss**. The SELLER shall bear the risk of loss or damage to the property by fire or other casualty until possession of the property has been delivered to the COMMONWEALTH. The SELLER may continue to insure the property after possession has been delivered until title has passed to the COMMONWEALTH under this Agreement. The SELLER shall ensure that any insurance policy(ies) on such building(s) shall be amended to provide for payment thereunder (by means of a standard mortgage clause) to the COMMONWEALTH of the amount paid to the SELLER under this Agreement.

6. **Notice to Vacate**. If this sale will result in a residential or business displacement, the COMMONWEALTH will not require vacation of the property for at least ninety (90) days from the date of execution of this Agreement. The COMMONWEALTH will issue a NOTICE TO VACATE to the SELLER at least thirty (30) days before the COMMONWEALTH takes possession of the property.

7. **Continued Possession**. The SELLER may remain in possession, on a rent-free basis, until N/A. After that date the SELLER shall pay rent to the COMMONWEALTH in the amount of $0.00 per month. The SELLER shall pay the rent, in advance, beginning N/A, on a month-to-month basis until possession of the property has been delivered to the COMMONWEALTH. The SELLER may relocate prior to this date. The SELLER shall execute the COMMONWEALTH's standard Lease Agreement, Form RW-670. Upon the expiration of one year, the amount of rental may be changed at the discretion of the COMMONWEALTH.

8. **Right of Entry**. Upon execution of this Agreement, the COMMONWEALTH, its agents and contractors, shall have the right to enter upon the premises to be conveyed for making studies, tests, soundings and appraisals.

9. **Settlement and Release**. The SELLER does further remise, release, quitclaim and forever discharge the COMMONWEALTH or any agency or political subdivision thereof or its or their employees or representatives of and from all suits, damages, claims and demands which the SELLER might otherwise have been entitled to assert under the provisions of the Eminent Domain Code, 26 Pa.C.S. § 101 et seq., for or on account of this conveyance and any injury to or destruction of the aforesaid property of the SELLER through or by reason of the aforesaid highway construction or improvement, except damages, if any, under Section 710 (Limited Reimbursement of Appraisal, Attorney and Engineering Fees) and Section 711 (Payment on Account of Increased Mortgage Costs) of the Eminent Domain Code; provided, however, that if relocation of a residence or business or farm operation is involved, this release shall likewise not apply to damages, if any, under Section 902 (Moving Expenses) and/or Section 903, 904 (Replacement Housing) and/or Section 905 (Housing Replacement Authorization) of the Eminent Domain Code.

10. **Tenant Indemnification.**

☐ No tenants.

☒ The SELLER shall indemnify the COMMONWEALTH against any claim made by any lessee of the property who has not entered into a Settlement Agreement with the COMMONWEALTH.

11. **Binding Effect**. This Agreement shall accrue to the benefit of and be binding upon the parties to this Agreement and their respective heirs, executors, administrators, representatives, successors and assigns.

12. **Applicable Law**. This Agreement shall be governed by and interpreted and enforced in accordance with the laws of the Commonwealth of Pennsylvania (without regard to any conflict of laws provisions).

13. **Severability**. The provisions of this Agreement shall be severable. If any phrase, clause, sentence or provision of this Agreement is declared to be contrary to the Constitution of Pennsylvania or of the United States or of the laws of the Commonwealth the applicability thereof to any government, agency, person or circumstance is held invalid, the validity of the remainder of this Agreement and the applicability thereof to any government, agency, person or circumstance shall not be affected thereby.

14. **No Waiver**. Either party may elect not to enforce its rights and remedies under this Agreement in the event of a breach by the other party of any term or condition of this Agreement. In any event, the failure by a party to enforce its rights and remedies under this Agreement shall not be construed as a waiver of any subsequent breach of the same or any other term or condition of this Agreement.

15. **Assignment**. This Agreement may not be assigned by the SELLER, either in whole or in part, without the written consent of the COMMONWEALTH.

16. **Third Party Beneficiary Rights**. The parties to this Agreement understand that this Agreement does not create or intend to confer any rights in or on persons or entities not a party to this Agreement.

17. **Right-To-Know Law**. The Pennsylvania Right-to-Know Law, 65 P.S. §§ 67.101-3104, applies to this Agreement.

18. **Integration and Merger**. This Agreement, when executed, approved and delivered, shall constitute the final, complete and exclusive Agreement between the parties containing all the terms and conditions agreed on by the parties. All representations, understandings, promises and agreements pertaining to the subject matter of this Agreement made prior to or at the time this Agreement is executed are superseded by this Agreement unless specifically accepted by any other term or provision of this Agreement. There are no conditions precedent to the performance of this Agreement except as expressly set forth herein.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the parties have executed this Agreement below.

INDIVIDUALS

_____

_____

_____

_____

_____

_____

ENTITIES*

SELLER:

Township of South Whitehall, a Political Subdivision of the Commonwealth of Pennsylvania
(Name of Entity)

BY:_____

BY:_____

* Use this block for a corporation, partnership, LLC, government entity, school district, church, trust, club, association, POA, attorney-in-fact, executor, administrator or any other entity. See R/W Manual Section 3.06.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

BY:_____
District Right-of-Way Administrator

Prepared By: ARROW Land Solutions, LLC
for the Commonwealth of Pennsylvania
1002 Hamilton Street
Allentown, PA 18101-1013

pennsylvania
DEPARTMENT OF TRANSPORTATION

Return To: ARROW Land Solutions, LLC
190 Welles St., Ste. 203
Forty Fort, PA 18704-4900

Site Location: Part of Tax Map Parcel No. 547685647629

RW-317F (10/21)
18-FA-48.1

ROW OFFICE PROJ. NO.	050380
COUNTY	Lehigh
S.R. - SECTION	0309-12M
MUNICIPALITY	South Whitehall Township
PARCEL NO.	72
CLAIM NO.	3900813000
CLAIMANT	Township of South Whitehall, a Political Subdivision of the Commonwealth of Pennsylvania

DEED
(Fee Simple)

THIS INDENTURE is made this ___day of _____ _____, by Township of South Whitehall, a Political Subdivision of the Commonwealth of Pennsylvania, 4444 Walbert Avenue, Allentown, PA 18104-1619, owner(s) of property affected by the construction or improvement of the above referenced State Route, its heirs, executors, administrators, successors, and/or assigns ("GRANTOR"), and the Commonwealth of Pennsylvania, through the Department of Transportation ("COMMONWEALTH" or "GRANTEE").

W I T N E S S E T H :

WHEREAS, the COMMONWEALTH recorded a plan in the Recorder of Deeds Office of the aforesaid County indicating its authorization to condemn GRANTOR's property for transportation construction or improvement on the above referenced State Route and Section; and

WHEREAS, the parties have agreed that, in lieu of condemnation, the GRANTOR will convey in fee simple and such other estate(s) as designated, if any, to the COMMONWEALTH the property or portion thereof required by the COMMONWEALTH.

NOW, THEREFORE, in consideration of the sum of One Dollar ($1.00) and other good and valuable consideration, the GRANTOR does hereby grant and convey in fee simple to the COMMONWEALTH:
☐ the premises described by metes and bounds in Exhibit A which is attached hereto.
☒ that portion of the premises designated as required right-of-way or as acquired in fee simple for other purposes on the plot plan which is attached hereto as Exhibit A; and those areas, if any, designated as required for easement purposes as identified in the plot plan.

BEING all or a portion of the same property conveyed or devised to the GRANTOR by Deed of Oakleigh Development Co., a Pennsylvania Corporation, dated July 27, 1965 and recorded in Deed Book 1081 Page 0388, together with the improvements, hereditaments and appurtenances thereto. This conveyance contains approximately 7,459 square feet of Required Right-of-Way for Limited Access and is identified on COMMONWEALTH plans as Parcel 71, being part of Tax Map Parcel No. 547685647629. The GRANTOR warrants GENERALLY the property hereby conveyed.

The GRANTOR hereby excepts and reserves from this conveyance all right, title, and interest in and to all minerals, including oil, gas, subsurface gas storage, and subsurface gas storage protection together with the right to produce, inject, store subsurface, withdraw, and protect natural gas and oil; said mining, removal, storage and storage protection activities to be accomplished from a minimum depth to be determined by the COMMONWEALTH, from mine shafts, wells or other facilities located off the right-of-way, it being the intent of this provision that the COMMONWEALTH owns the right of support and no mineral activities may take place on the surface of the land acquired by the COMMONWEALTH.

The GRANTOR does further remise, release, quitclaim and forever discharge the COMMONWEALTH or any agency or political subdivision thereof or its or their employees or representatives of and from all suits, damages, claims and demands which the GRANTOR might otherwise have been entitled to assert under the provisions of the Eminent Domain Code, 26 Pa.C.S. § 101 et seq., for or on account of this conveyance and any injury to or destruction of the aforesaid property of the GRANTOR through or by reason of the aforesaid highway construction or improvement, except damages, if any, under Section 710 (Limited Reimbursement of Appraisal, Attorney and Engineering Fees) and Section 711 (Payment on Account of Increased Mortgage Costs) of the Eminent Domain Code; provided, however, that if relocation of a residence or business or farm operation is involved, this release shall likewise not apply to damages, if any, under Section 902 (Moving Expenses) and/or Section 903, 904 (Replacement Housing) and/or Section 905 (Housing Replacement Authorization) of the Eminent Domain Code.

The GRANTOR does further indemnify the COMMONWEALTH against any claim made by any lessee of the aforesaid property who has not entered into a Settlement Agreement with the COMMONWEALTH.

The covenants, terms, and conditions of this Indenture shall be binding upon the GRANTOR and the GRANTOR's heirs, executors, administrators, successors and assigns.

Certificate of Residence

I hereby certify the Grantee's precise residence to be:

1002 Hamilton St.
Allentown, PA 18101-1013

Witness my hand this _____ day of _____, _____

_____
Agent for the Commonwealth of Pennsylvania
Department of Transportation

IN WITNESS WHEREOF, the GRANTOR has executed or caused to be executed these presents, intending to be legally bound thereby.

INDIVIDUALS

_____

_____

_____

_____

_____

_____

ENTITIES*

GRANTOR:
Township of South Whitehall, a Political _____
(Name of Entity)

BY:_____

BY:_____

* Use this block for a corporation, partnership, LLC, government entity, school district, church, trust, club, association, POA, attorney-in-fact, executor, administrator or any other entity. See R/W Manual Section 3.06.

INDIVIDUAL

STATE OF PENNSYLVANIA
COUNTY OF _____

On this_____ day of_____, 20____, before me,_____, the undersigned officer, personally appeared _____
_____
_____, known to me (or satisfactorily proven) to be the person(s) whose name(s) _____ subscribed to the within instrument, and acknowledged that _____ executed the instrument for the purposes contained in it.

In witness whereof, I hereto set my hand and official seal.

_____ [*Signature*]
_____ [*Title*]

[*Seal*]

ENTITY

STATE OF PENNSYLVANIA
COUNTY OF _____

On this _____ day of _____, 20____, before me, _____, the undersigned officer, personally appeared _____ _____, who acknowledged _____self to be the _____ [*title*] of _____ [*name of entity*], and that as such _____ _____ [*title*], being authorized to do so, executed the foregoing instrument for the purposes contained in it by signing on behalf of the entity as _____ [*title*].

In witness whereof, I hereto set my hand and official seal.

_____ [*Signature*]
_____ [*Title*]

[*Seal*]

APPROVED AS TO FORM AND LEGALITY:

_____
For Chief Counsel

This space intentionally left blank.

SOUTH WHITEHALL TOWNSHIP

MEMORANDUM FOR AGENDA ITEMS

TO:	Board of Commissioners
FROM:	Herb Bender
DATE:	August 11, 2022
SUBJECT:	Sanitary Sewer Relocation
COPY TO:	M.Elias, S.Boehret, T. Dickert

- **Background Information and/or Justification of Expense:**

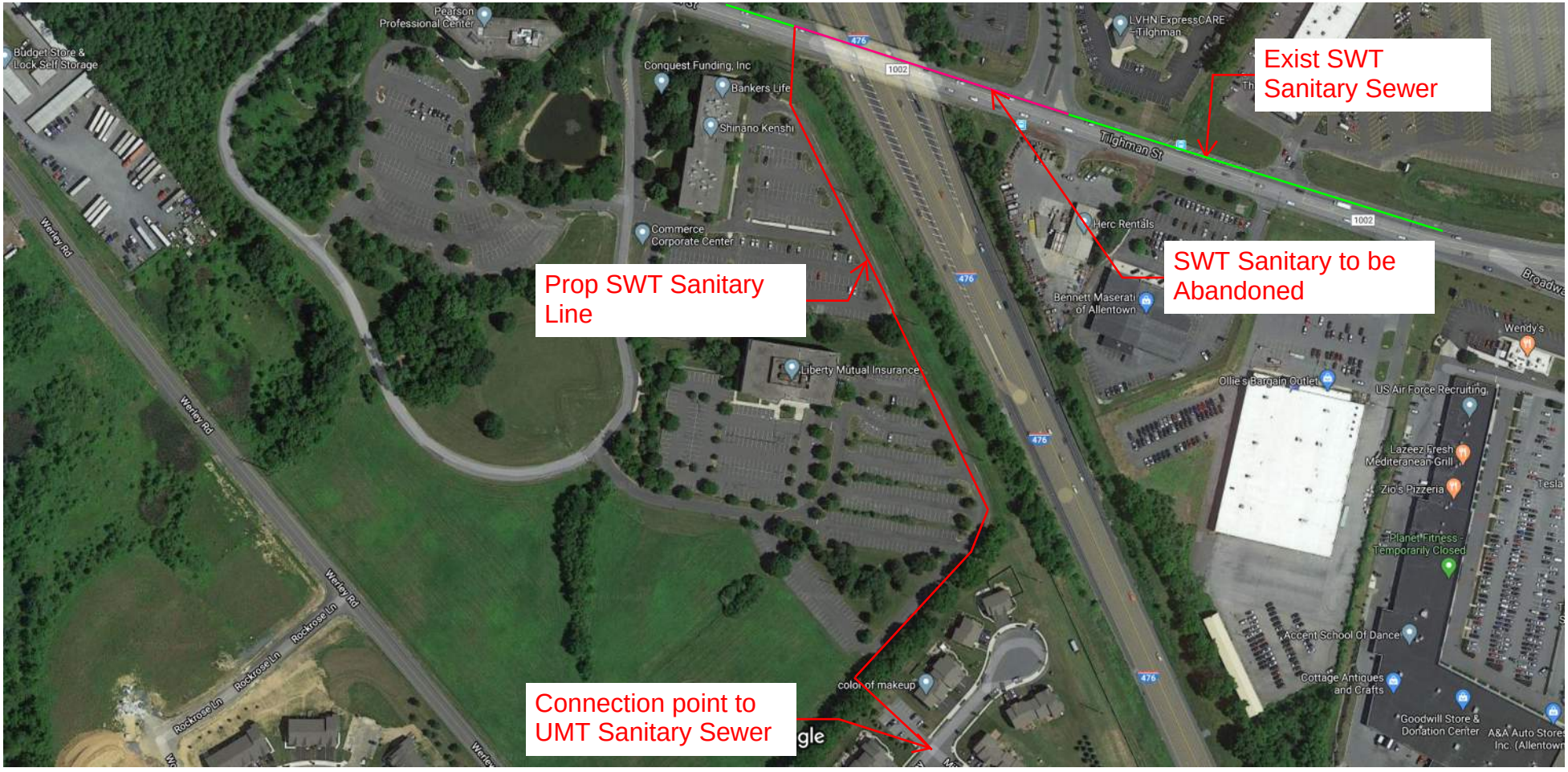
  Public Works sewer division is respectfully asking for permission to advertise the work to move the sewer line that is currently suspended on the Tilghman St. bridge over the turnpike. We are currently working with property owner to obtain an easement. The reason we are coming to the Board now is so that once we have the easement, we can go right out to bid. This project needs to be done by the end of the year.

- **Action Requested:**

  Approval to advertise the work to relocate the sewer line.

- **Budget Line Item (if applicable):**

Google Maps



Imagery ©2020 Maxar Technologies, PA Department of Conservation and Natural Resources-PAMAP/USGS, USDA Farm Service Agency, Map data ©2020 100 ft

SOUTH WHITEHALL TOWNSHIP

MEMORANDUM FOR AGENDA ITEMS

TO:	Board of Commissioners
FROM:	Herb Bender
DATE:	August 10, 2022
SUBJECT:	Nixle 360
COPY TO:	M. Elias, S. Boehret, D. Manhardt, J. Kelly

- **Background Information and/or Justification of Expense:**

  Public Works, along with Emergency Management and the Police Department, are requesting a motion to move forward with Nixle 360. The price for this program is $4,374.00. This will allow all of us to send out messages to the residents of South Whitehall Township. Myself, along with Jeff Kelly and Chief Glen Dorney, feel this program will be very helpful to get any kind of messages out to the Public.

- **Action Requested:**

  Public Works, along with Emergency Management and the Police Department, are respectfully requesting a motion to approve signing a one-year contract with Nixle for $4,374.00.

- **Budget Line Item (if applicable):** *Please indicate approved budget amount for specified project(s).*

  01430002/40450

everbridge

nixle
Everbridge acquired Nixle in 2014

Quotation

Prepared for:
Herb Bender
South Whitehall Township
4444 Walbert Ave.
Allentown PA 18104
United States
Ph: (610) 398-0407
Fax:
Email: benderh@southwhitehall.com

Quote #: Q-108738
Date: 7/12/2022
Expires On: 8/19/2022
Confidential

Salesperson: Luke Mastrianni
Phone:
Email: luke.mastrianni@everbridge.com

Contract Summary Information:	
Contract Period:	12 Months
Contract Option Years (in months)	24 Months
Note: **Quantity on this quote represents the population count	

QTY	DESCRIPTION	PRICE
19,500	Nixle 360	USD 4,050.00
1	Calculated Set Up Fee	USD 324.00

Pricing Summary:

Year One Fees:	USD 4,050.00
One-time Implementation and Setup Fees:	USD 324.00
Professional Services:	USD 0.00
Total Year One Fees Due:	**USD 4,374.00**

Option Years:

Contract Option Years (in months)	24 Months
Ongoing Annual Fees :	USD 4,050.00

Messaging Credits Summary:

	Initial Credits Allowance	Additional Credits Purchased	Total Credits
Year 1	1,000,000	0	1,000,000

everbridge
500 N. Brand Blvd., Ste. 1000 t 888.366.4911 www.everbridge.com
Glendale, CA 91203 USA f 818.484.2299

CLIENT REGISTRATION FORM

*Required information

***Client Name:**

Account Number: (Internal use only)

***Requestor/Approver of Services:**

Contact Name:

Phone Number:

Email Address:

Other Number:

***Billing Address:**

Contact Name:

Address:

City:

State/Province/Region:

Postal/Zip Code:

Country:

***Shipping/Primary Service Location Address:**

Contact Name:

Address:

City:

State/Province/Region:

Postal/Zip Code:

Country:

***Accounts Payable Department:**

Contact Name:

Email Address:

Phone Number:

Fax Number:

Address: *same as Billing Address* *same as Shipping Address*

City:

State/Province/Region:

Postal/Zip Code:

Country:

Purchasing Department:

Contact Name:

Email Address:

Phone Number:

Fax Number:

Address: *same as Billing Address* *same as Shipping Address*

City:

State/Province/Region:

Postal/Zip Code:

Country:

***Invoice Submission Email Address(s):**

***Do you require a Purchase Order to process payment?** **Yes** **No**

If Yes, please send Purchase Order to Final.Documents@everbridge.com

(For U.S. Clients only)

***Is your organization exempt from paying Sales and Use Tax?** **Yes** **No**

If your organization is exempt or is utilizing Direct Pay, please attach a copy of your Exemption or Direct Pay Certificate to this form

*If either of the certificates is not attached to this form, sales tax will be added where applicable.

Please provide any special instructions for submitting and processing invoices for payment:

Please list and attach any required forms and/or web links for invoice processing:

e.g., Wire/EFT/ACH forms, Vendor forms, W9 forms, Registration links

Please return the form via Email to Final.Documents@everbridge.com or Fax to 818-484-2299

1. This Quote and the Service(s) provided are subject to the Everbridge, Inc. –Nixle Master Service Agreement ("Service Agreement"), current as of the date of Client's signature below. Please visit https://docs.everbridge.com/cdn/legal/Nixle-Master-Services-Agreement-Hyperlink-v9.pdf to review the Service Agreement in its entirety. By signing this Quote you represent that you read, understand and agree to the terms of the Service Agreement, and are authorized on behalf of the Client to execute the Quote and bind Client to the Service Agreement.
2. Messaging Credits listed above can be used for Notifications and expire at the end of each year. Consumption of Messaging Credits in excess of these amounts in any year will incur additional charges.
3. Subject to sales taxes where applicable.
4. Except for currency designation, the supplemental notes below, if any, supplied in this Quote are for informational purposes and not intended to be legally binding or override the language of the Service Agreement.

Authorized by Everbridge:

Signature: _____ **Date:**

Name (Print): _____ **Title:** _____

To accept this quote, sign, date and return:

Signature: _____ **Date:**

Name (Print): _____ **Title:** _____

155 North Lake Avenue, Suite 900
Pasadena, CA 91101 USA
Tel: +1-818-230-9700
Fax: +1-818-230-9505

THANK YOU FOR YOUR BUSINESS!

SOUTH WHITEHALL TOWNSHIP

MEMORANDUM FOR AGENDA ITEMS

TO:	Board of Commissioners
FROM:	Mike Kukitz
DATE:	August 17, 2022
SUBJECT:	Recommendation for Jordan Creek Greenway Trail shared road section.
COPY TO:	H. Bender, S. Boehret

- **Background Information and/or Justification of Expense:**

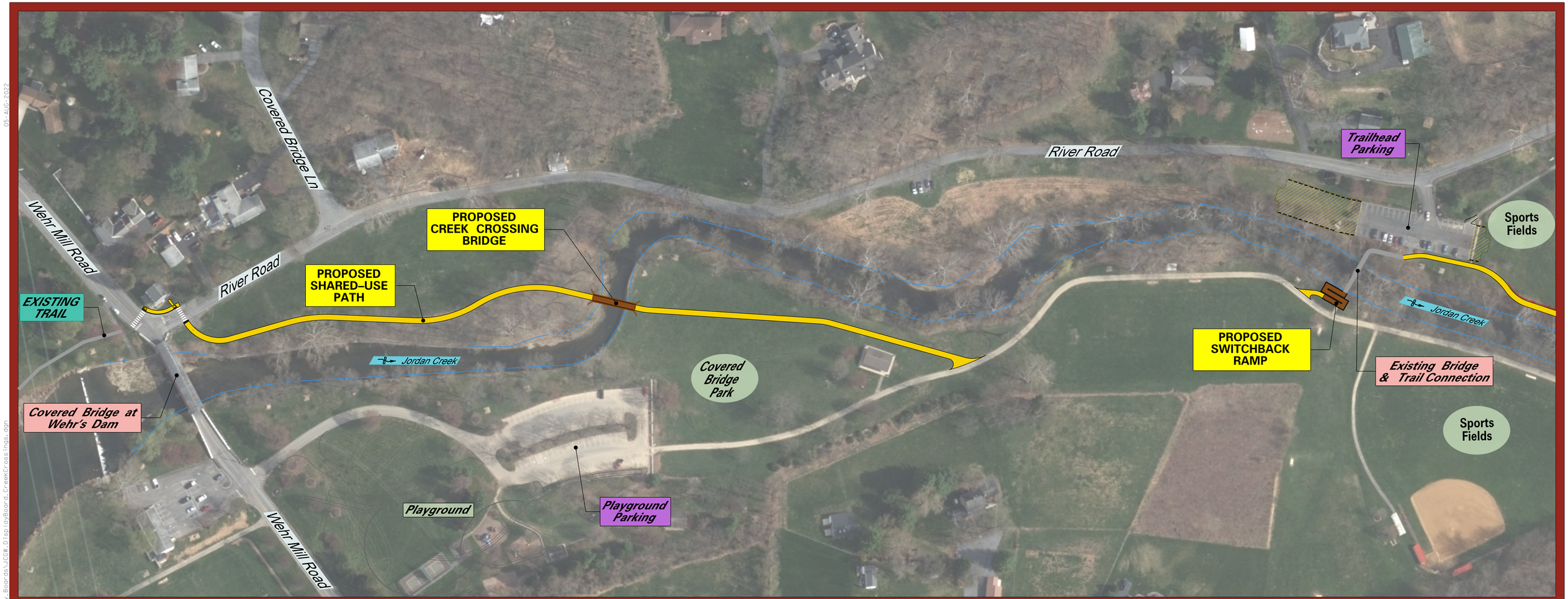
  Staff has followed up on a request of the Board of Commissioners to look at possible alternatives to the proposed shared road section of the Jordan Creek Greenway Trail on River Road.

- **Action Requested:**

  After looking at the LTAP traffic data and having many discussions with traffic/design professionals, staff recommends moving forward with Alternative #2 Roadway Widening to the North.

- **Budget Line Item (if applicable):** *Please indicate approved budget amount for specified project(s).*

  TBD – the engineering and permitting will need to be budgeted in 2023. Construction will need to be budgeted in 2024.



JORDAN CREEK GREENWAY

SOUTH WHITEHALL TOWNSHIP

PREPARED BY:

Michael Baker INTERNATIONAL

645 HAMILTON STREET, SUITE 206
ALLENTOWN, PA 18101

Jordan Creek GREENWAY

JORDAN CREEK TRAIL
WEHR MILL RD TO CEDAR CREST BLVD

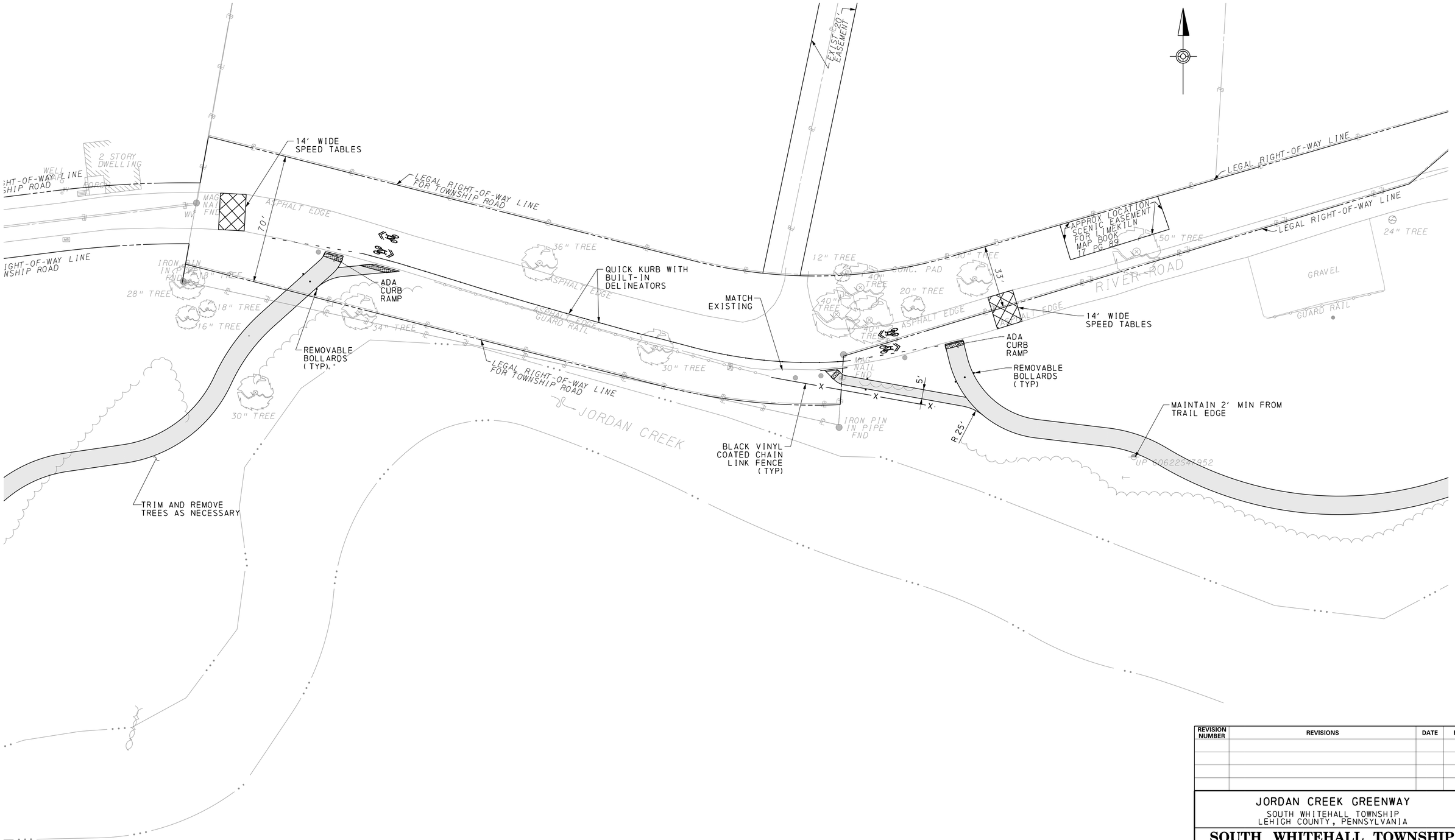
South Whitehall Township
Lehigh County - Pennsylvania

N

0 60 120 240 FEET

AUG 05, 2022

DCNR



LEGEND:

- PROPOSED SHARED USE PATH

SCALE IN FEET: 0 25 50

ALTERNATIVE 1:
TRAIL ALONG ROADWAY WITH TRAFFIC CALMING MEASURES

REVISION NUMBER	REVISIONS	DATE	BY

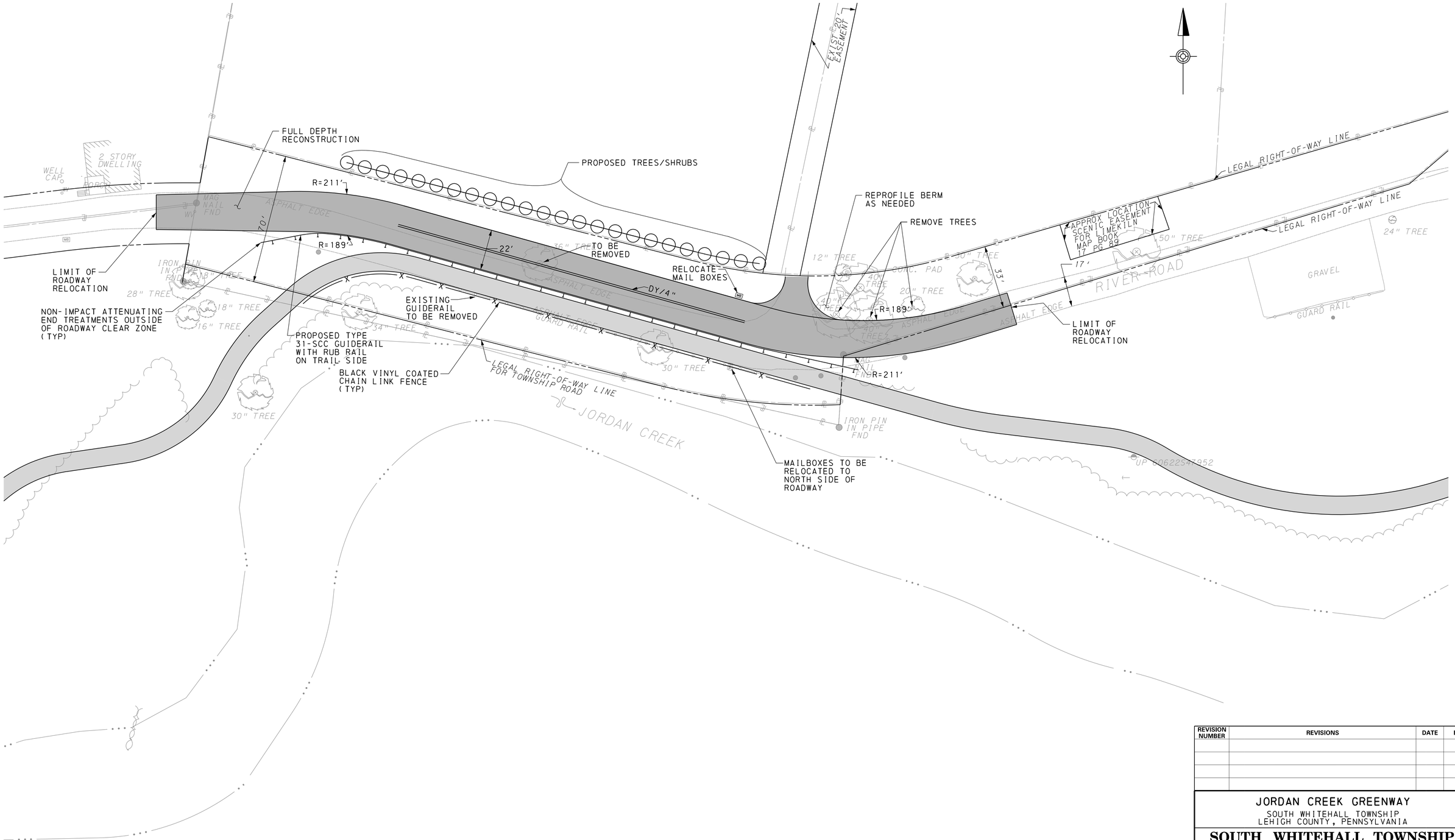
JORDAN CREEK GREENWAY
SOUTH WHITEHALL TOWNSHIP
LEHIGH COUNTY, PENNSYLVANIA

SOUTH WHITEHALL TOWNSHIP
4444 WALBERT AVENUE
ALLENTOWN, PA 18104

DATE		APPROVED
JUNE 2022	**CONSTRUCTION PLANS**	WLT
DRAWN BY		SHEET
EAR	**ALTERNATIVE 1**	

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR AND OWNER MUST BE NOTIFIED OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

E:\179583_JordanCreek GRWay_SW\Plot\Plan\Alternatives\XX-JCSW_ConstrPlan_ALT1.dgn
13-JUN-2022



LEGEND:

- PROPOSED SHARED USE PATH

0 25 50

SCALE IN FEET

ALTERNATIVE 2:
ROADWAY WIDENING TO NORTH

REVISION NUMBER	REVISIONS	DATE	BY

JORDAN CREEK GREENWAY
SOUTH WHITEHALL TOWNSHIP
LEHIGH COUNTY, PENNSYLVANIA

SOUTH WHITEHALL TOWNSHIP
4444 WALBERT AVENUE
ALLENTOWN, PA 18104

DATE		APPROVED
JUNE 2022	**CONSTRUCTION PLANS**	WLT
DRAWN BY		SHEET
EAR	**ALTERNATIVE 2**	

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR AND OWNER MUST BE NOTIFIED OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

13-JUN-2022

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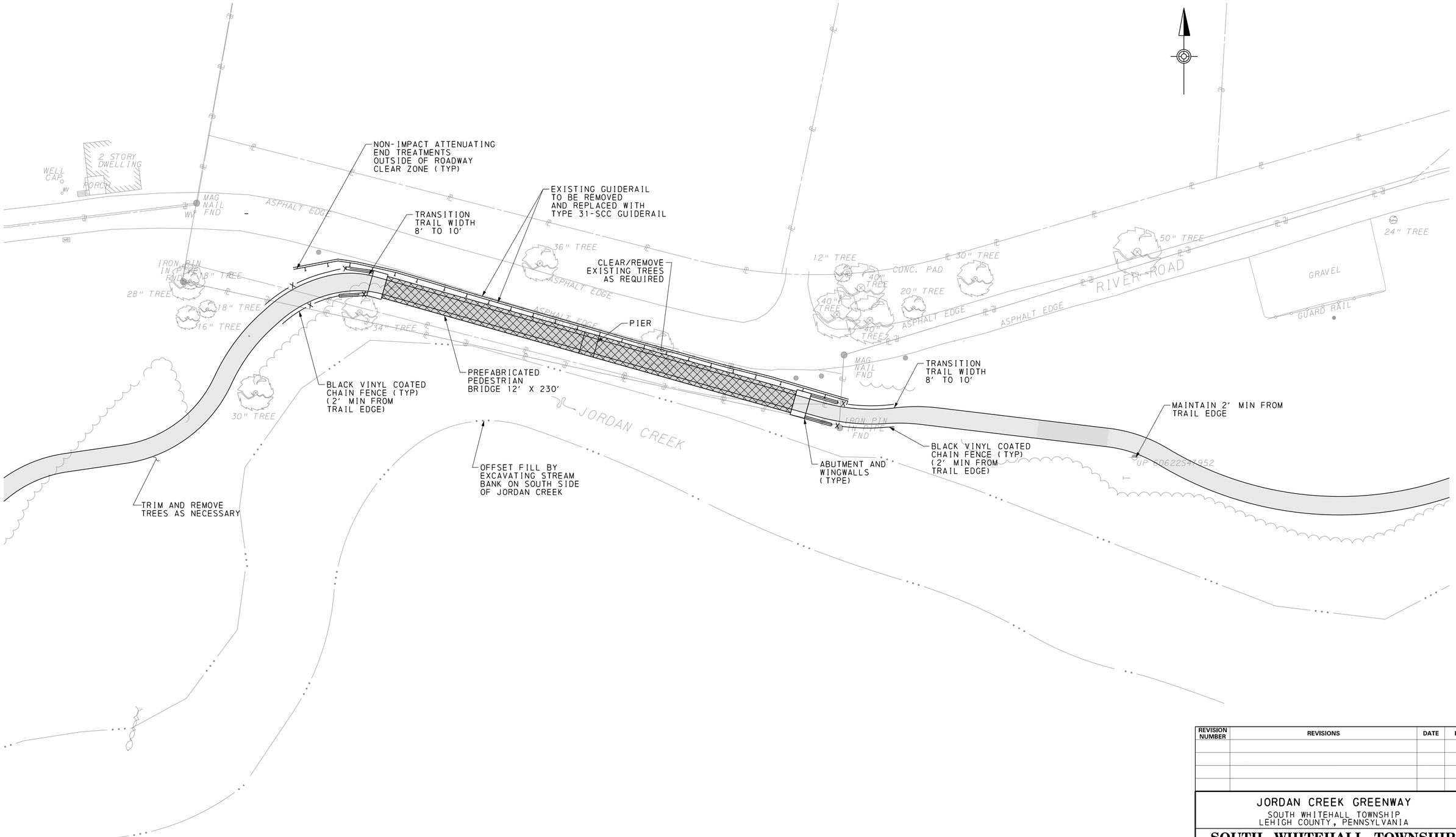

LEGEND:

- PROPOSED SHARED USE PATH
- PROPOSED TRAIL BRIDGE

0 25 50
SCALE IN FEET

ALTERNATIVE 3: PEDESTRIAN BRIDGE

REVISION NUMBER	REVISIONS	DATE	BY

JORDAN CREEK GREENWAY
SOUTH WHITEHALL TOWNSHIP
LEHIGH COUNTY, PENNSYLVANIA

SOUTH WHITEHALL TOWNSHIP
4444 WALBERT AVENUE
ALLENTOWN, PA 18104

DATE		APPROVED
JUNE 2022	**CONSTRUCTION PLANS**	WLT
DRAWN BY		SHEET
EAR	**ALTERNATIVE 3**	

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR AND OWNER MUST BE NOTIFIED OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

13-JUN-2022

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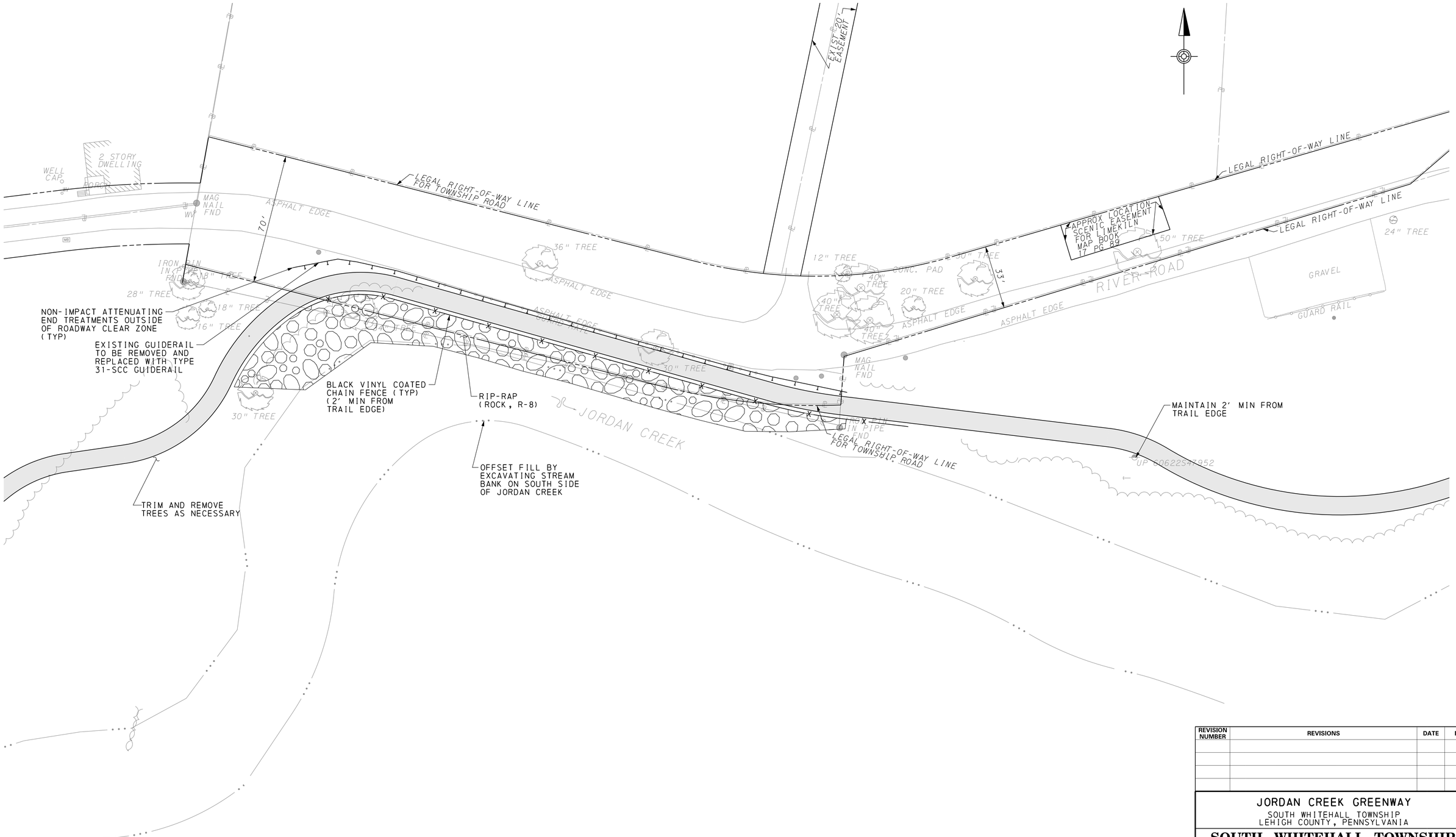

LEGEND:

- PROPOSED SHARED USE PATH

0 25 50

SCALE IN FEET

ALTERNATIVE 4: STREAM BANK WIDENING AND STABILIZATION

REVISION NUMBER	REVISIONS	DATE	BY

JORDAN CREEK GREENWAY
SOUTH WHITEHALL TOWNSHIP
LEHIGH COUNTY, PENNSYLVANIA

SOUTH WHITEHALL TOWNSHIP
4444 WALBERT AVENUE
ALLENTOWN, PA 18104

DATE		APPROVED
JUNE 2022	**CONSTRUCTION PLANS**	WLT
DRAWN BY		SHEET
EAR	**ALTERNATIVE 4**	

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR AND OWNER MUST BE NOTIFIED OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

13-JUN-2022

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13-JUN-2022

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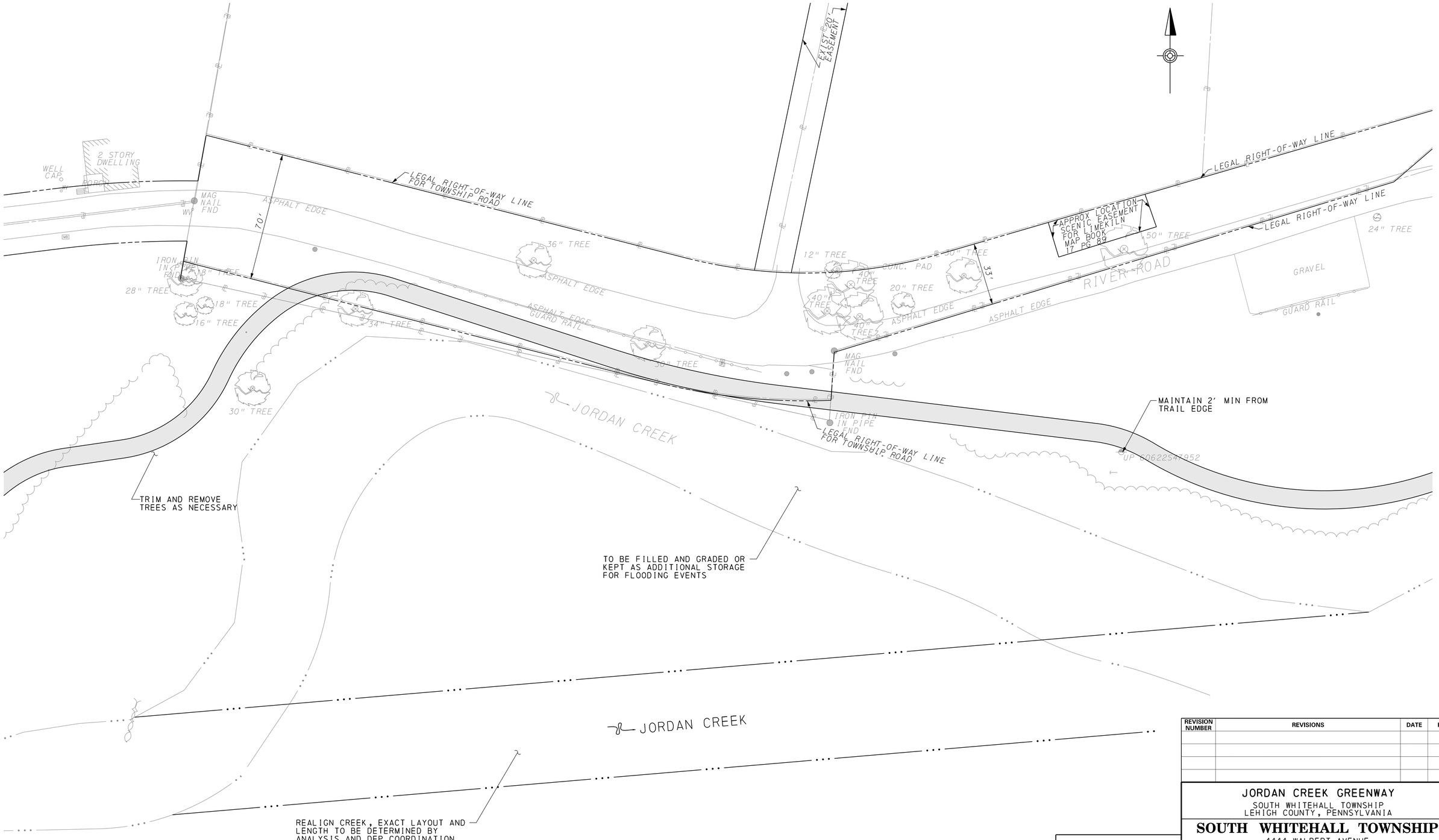

LEGEND:

- PROPOSED SHARED USE PATH

0 25 50

SCALE IN FEET

ALTERNATIVE 5: CREEK REALIGNMENT

REVISION NUMBER	REVISIONS	DATE	BY

JORDAN CREEK GREENWAY

SOUTH WHITEHALL TOWNSHIP
LEHIGH COUNTY, PENNSYLVANIA

SOUTH WHITEHALL TOWNSHIP

4444 WALBERT AVENUE
ALLENTOWN, PA 18104

DATE		APPROVED
JUNE 2022	**CONSTRUCTION PLANS**	WLT
DRAWN BY		SHEET
EAR	**ALTERNATIVE 5**	

ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR AND OWNER MUST BE NOTIFIED OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

Jordan Creek Greenway - River Road Pinch Point Alternatives	
Alternative 1: Trail Along Roadway with Traffic Calming Measures	
Construction Cost:	$82,000
Engineering Cost:	$0
Permitting Cost:	$0
Total Estimated Cost:	**$82,000**
Alternative 2: Roadway Widening to North	
Construction Cost:	$443,000
Engineering Cost:	$100,000
Permitting Cost:	$29,500
Total Estimated Cost:	**$572,500**
Alternative 3: Pedestrian Bridge	
Construction Cost:	$2,096,000
Engineering Cost:	$185,000
Permitting Cost:	$29,500
Total Estimated Cost:	**$2,310,500**
Alternative 4: Stream Bank Widening and Stabilization	
Construction Cost:	$692,000
Engineering Cost:	$130,000
Permitting Cost:	$70,000
Total Estimated Cost:	**$892,000**
Alternative 5: Stream Realignment	
Construction Cost:	$1,287,000
Engineering Cost:	$200,000
Permitting Cost:	$110,000
Total Estimated Cost:	**$1,597,000**

Alternative 1 - Trail Along Roadway with Traffic Calming Measures

Item	Unit	Quantity	Unit Cost	Total Cost	Cost Source
Pavement Markings	LS	1	$3,500	$3,500	PennDOT ECMS
Signing	LS	1	$5,000	$5,000	PennDOT ECMS
Qwick Kurb	LF	275	$75	$20,625	Project History
Rubber 3" High Speed Tables	EA	2	$6,600	$13,200	Traffic Logix
Black Vinyl Coated Chain Link Fence	LF	90	$125	$11,250	PennDOT ECMS
			Subtotal	**$53,575**	
E&S Control (3%)	LS	1		$1,607	
Survey (5%)	LS	1		$2,679	
Traffic Control (10%)	LS	1		$5,358	
Mobilization (5%)	LS	1		$2,679	
Contingency (20%)	LS	1		$10,715	
CM/CI (10%)	LS	1		$5,358	
			Construction Total	**$82,000**	

Assumptions:

1. Design and Permitting completed under trail project scope
2. Speed Table reduces speed to 20 mph +/- 5 mph per vendor
3. Speed humps (15 mph) and speed cushions (10-15 mph) are also available for similar material costs
4. Costs are for roadway improvements only - off-road trail is not included
5. Costs include material and installation costs by a contractor

Alternative 1 - Trail Along Roadway with Traffic Calming Measures		
Design		
Task Number	**Task**	
1	All tasks included in existing work order for Phase 1 trail	
	Design Total	**$0**
Permitting		
Task Number	**Task**	
1	All tasks included in existing work order for Phase 1 trail	
	Permitting Total	**$0**

Alternative 2 - Roadway Widening to North					
Item	**Unit**	**Quantity**	**Unit Cost**	**Total Cost**	**Cost Source**
Pavement Markings	LS	1	$1,500	$1,500	PennDOT ECMS
Signing	LS	1	$1,500	$1,500	PennDOT ECMS
Guiderail Removal	LF	190	$15	$2,850	PennDOT ECMS
Type 31-SCC Guiderail Installation	LF	335	$100	$33,500	PennDOT ECMS
Rubbing Rail	LF	335	$25	$8,375	PennDOT ECMS
Guiderail Terminal End Section, Single	EA	2	$350	$700	PennDOT ECMS
Black Vinyl Coated Chain Link Fence	LF	300	$125	$37,500	PennDOT ECMS
Landscaping	LS	1	$20,000	$20,000	PennDOT ECMS
Excavation	CY	580	$55	$31,900	PennDOT ECMS
Roadway Pavement	SY	1155	$113	$130,515	PennDOT ECMS
Trail Pavement	SY	330	$78	$25,740	PennDOT ECMS
Tree Removal	EA	4	$4,000	$16,000	PennDOT ECMS
			Subtotal	**$310,000**	
E&S Control (2%)	LS	1		$6,200	
Survey (3%)	LS	1		$9,300	
Traffic Control (3%)	LS	1		$9,300	
Mobilization (5%)	LS	1		$15,500	
Contingency (20%)	LS	1		$62,000	
CM/CI (10%)	LS	1		$31,000	
			Construction Total	**$443,000**	

Assumptions:

1. Type 31-SCC guide rail utilized due to offset between guide rail and trail of less than 3' (SCC deflection is 1.5')
See PennDOT DM-2 Table 12.4 for guide rail types and deflection distances
2. Includes portion of trail along guiderail only (i.e. portion that would be on-road for Alt 1)
3. Roadway pavement assumes 0.3 to 3 million ESALS and includes 1.5" wearing (SRL-H), 3" binder, 6" base, and 6" subbase
4. Trail pavement assumes 0.3 to 3 million ESALS and includes 1.5" wearing (SRL-H), 6" base, and 6" subbase
5. Assumes full excavation and replacement of existing roadway due to condition and substandard grading/superelevation
6. Pavement pricing assumes material to be purchased and installed by contractor not Township
7. Costs include material and installation costs by a contractor

Alternative 2 - Roadway Widening to North

Design

Task Number	Task	
1	Horizontal Roadway Design	
2	Vertical Roadway Design	
3	Landscape Design	
4	Maintenance and Protection of Traffic	
5	Signing and Striping	
6	Trail Horizontal and Vertical Design	
7	Guiderail and End Treatments	
8	Erosion and Sediment Control	
9	Drainage Design	
10	Bid Package	
	Design Total	**$100,000**

Permitting

Task Number	Task	
1	Lehigh County Conservation District Permit	
2	PA DEP Permit	
3	Cultural Resources/Archeology	
	Permitting Total	**$29,500**

Assumptions:

1. Design and permitting costs assume a local bid project - no ECMS work included

Alternative 3 - Pedestrian Bridge

Item	Unit	Quantity	Unit Cost	Total Cost	Cost Source
Guiderail Removal	LF	190	$15	$2,850	PennDOT ECMS
Type 31-SCC Guiderail Installation	LF	335	$100	$33,500	PennDOT ECMS
Guiderail Terminal End Section, Single	EA	2	$350	$700	PennDOT ECMS
Offset Excavation	CY	1500	$45	$67,500	PennDOT ECMS
Black Vinyl Coated Chain Link Fence	LF	205	$125	$25,625	PennDOT ECMS
Pre-Fabricated Pedestrian Bridge	LS	1	$900,000	$900,000	Project History
Abutment, Wingwalls, and Excavation	LS	1	$450,000	$450,000	Project History
Geotechnical Borings	LS	1	$15,000	$15,000	Project History
			Subtotal	**$1,495,000**	
E&S Control	LS	1		$15,000	
Cofferdams and Dewatering	LS	1		$75,000	
Clearing and Grubbing	LS	1		$15,000	
Survey	LS	1		$7,500	
Traffic Control	LS	1		$10,000	
Mobilization (2%)	LS	1		$29,900	
Contingency (20%)	LS	1		$299,000	
CM/CI (10%)	LS	1		$149,500	
			Construction Total	**$2,096,000**	

Assumptions:

1. Type 31-SCC guide rail utilized due to offset between guide rail and bridge of less than 3' (SCC deflection is 1.5')
See PennDOT DM-2 Table 12.4 for guide rail types and deflection distances
2. Bridge price includes delivery, tax, and installation
3. Length of bridge (230') is approximate based on existing topography - final bridge may vary in length
4. Offset excavation within floodway required so that the project has a net neutral impact on the floodway/floodplain
5. A pier is required to reduce the span lengths and overall construction cost.
6. Abutments and piers must be a minimum of 6' deeper than existing creek grade.
7. Costs include material and installation costs by a contractor

Alternative 3 - Pedestrian Bridge

Design

Task Number	Task	
1	Structural Design	
2	Trail Horizontal and Vertical Design	
3	Guiderail and End Treatments	
4	Maintenance and Protection of Traffic	
5	Signing and Striping	
6	Erosion and Sediment Control	
7	Hydraulic and Hydrologic Study	
8	Bid Package	
	Design Total	**$185,000**

Permitting

Task Number	Task	
1	Lehigh County Conservation District Permit	
2	PA DEP Permit	
3	Cultural Resources/Archeology	
	Permitting Total	**$29,500**

Assumptions:

1. Design and permitting costs assume a local bid project - no ECMS work included

Alternative 4 - Stream Bank Widening and Stabilization

Item	Unit	Quantity	Unit Cost	Total Cost	Cost Source
Guiderail Removal	LF	190	$15	$2,850	PennDOT ECMS
Type 31-SCC Guiderail Installation	LF	335	$100	$33,500	PennDOT ECMS
Guiderail Terminal End Section, Single	EA	2	$350	$700	PennDOT ECMS
Black Vinyl Coated Chain Link Fence	LF	345	$125	$43,125	PennDOT ECMS
Trail Pavement	SY	330	$78	$25,740	PennDOT ECMS
Offset and Undercut Excavation and Embankment	CY	1780	$85	$151,300	PennDOT ECMS
Rip-Rap (R-8)	CY	1350	$100	$135,000	Project History
Geotextile, Class 4, Type A	SY	780	$5	$3,900	Project History
Erosion Control Matting (Heavy Duty Coir)	SY	3000	$15	$45,000	Project History
Brush Layer Bundles	EA	111	$20	$2,220	Project History
			Subtotal	**$443,000**	
E&S Control	LS	1		$15,000	
Cofferdams and Dewatering	LS	1		$75,000	
Survey	LS	1		$7,500	
Traffic Control	LS	1		$10,000	
Mobilization (2%)	LS	1		$8,860	
Contingency (20%)	LS	1		$88,600	
CM/CI (10%)	LS	1		$44,300	
			Construction Total	**$692,000**	

Assumptions:

1. Type 31-SCC guide rail utilized due to offset between guide rail and trail of less than 3' (SCC deflection is 1.5')
See PennDOT DM-2 Table 12.4 for guide rail types and deflection distances
2. Assumes 1.5:1 slope of rip-rap
3. Offset excavation within floodway required so that the project has a net neutral impact on the floodway cross-sectional coneyance area
4. Costs include material and installation costs by a contractor

Alternative 4 - Stream Bank Widening and Stabilization		
Design		
Task Number	**Task**	
1	Data Collection	
2	Preliminary Design	
3	H&H Modeling	
4	Final Design	
5	Bid Package	
6	Construction Services	
7	Public Engagement	
	Design Total	**$130,000**
Permitting		
Task Number	**Task**	
1	Lehigh County Conservation District Permit	
2	PA DEP Chapter 105, NPDES Permits	
3	Cultural Resources/Archeology	
	Permitting Total	**$70,000**
Assumptions:		
1. No CLOMR/LOMR anticipated or included		

Alternative 5 - Stream Realignment					
Item	**Unit**	**Quantity**	**Unit Cost**	**Total Cost**	**Cost Source**
Gabion Removal	CY	450	$95	$42,750	Project History
Excavation	CY	6700	$85	$569,500	PennDOT ECMS
Alluvium Layer (24" Thick)	CY	1850	$75	$138,750	Project History
Erosion Control Matting (Heavy Duty Coir)	SY	1800	$15	$27,000	Project History
Natural Channel Structures (Log Vane/Rock Vane)	EA	5	$8,000	$40,000	Project History
Live Stakes	EA	2000	$3	$6,000	Project History
Container Trees	EA	160	$300	$48,000	Project History
			Subtotal	**$872,000**	
E&S Control	LS	1		$35,000	
Clearing and Grubbing	LS	1		$5,000	
Cofferdams and Dewatering	LS	1		$50,000	
Survey	LS	1		$15,000	
Traffic Control	LS	1		$5,000	
Mobilization (5%)	LS	1		$43,600	
Contingency (20%)	LS	1		$174,400	
CM/CI (10%)	LS	1		$87,200	
			Construction Total	**$1,287,000**	

Assumptions:

1. Gabions required to be removed for relocation will be abandoned in place.
2. Assumes 2' of existing stream bed will be excavated and laid within new stream bed as alluvium layer.

Alternative 5 - Stream Realignment

Design

Task Number	Task	
1	Data Collection	
2	Preliminary Design	
3	H&H Modeling	
4	Final Design	
5	Trail Design	
6	Bid Package	
7	Construction Services	
8	Public Engagement	
	Design Total	**$200,000**

Permitting

Task Number	Task	
1	Lehigh County Conservation District Permit	
2	PA DEP Chapter 105, NPDES Permits	
3	Cultural Resources/Archeology	
4	CLOMR/LOMR Preparation	
	Permitting Total	**$110,000**

Assumptions:

1. Curved section of stream to be realigned to south away from River Road

Michael Baker INTERNATIONAL

Jordan Creek Greenway - Phase 1 - Preliminary Opinion of Cost

Item	Description	Unit	Amount	Unit Price	Item Cost
Trailhead Parking Area					
0413-0192	Superpave Asphalt Mixture Design, Wearing Course, PG 64S-22, < 0.3 Million ESALs, 9.5 mm Mix, 1 1/2" Depth, SRL-H	SY	1,226	$20.00	$24,520
0313-0326	Superpave Asphalt Mixture Design, Base Course, PG 64S-22, < 0.3 Million ESALs, 25.00 mm Mix, 6" Depth	SY	1,226	$45.00	$55,170
0350-0106	Subbase 6" Depth (No. 2A)	SY	1,226	$15.00	$18,390
0460-0001	Asphalt Tack Coat	SY	1,226	$1.50	$1,840
0203-0001	Class 1 Excavation	CY	460	$50.00	$23,000
-	Wheel Stops	EA	32	$150.00	$4,800
				Parking Lot Subtotal:	**$127,800**
Trail					
0413-0192	Superpave Asphalt Mixture Design, Wearing Course, PG 64S-22, < 0.3 Million ESALs, 9.5 mm Mix, 1 1/2" Depth, SRL-H	SY	5,225	$20.00	$104,500
0313-0320	Superpave Asphalt Mixture Design, Base Course, PG 64S-22, < 0.3 Million ESALs, 25.00 mm Mix, 3" Depth	SY	5,225	$25.00	$130,630
0350-0106	Subbase 6" Depth (No. 2A)	SY	5,225	$15.00	$78,380
0460-0001	Asphalt Tack Coat	SY	5,225	$1.50	$7,840
0203-0001	Class 1 Excavation	CY	512	$50.00	$25,600
	Geotextile, Class 4 Type A	SY	5225	$3.50	$18,290
	Placing of Stockpiled Topsoil	CY	470	$32.50	$15,280
-	Black Vinyl Coated Chain Link Fence	LF	550	$50.00	$27,500
				Trail Subtotal:	**$408,100**
Sidewalk and Curb Ramps					
0676-0001	Plain Cement Concrete Sidewalk (4" Depth)	SY	41	$225.00	$9,230
0203-0001	Class 1 Excavation	CY	3	$50.00	$150
0695-0004	Detectable Warning Surface	SF	118	$55.00	$6,490
0630-0010	Plain Cement Concrete Curb, Including Removal of Ex. Curb	LF	102	$200.00	$20,400
				Sidewalk and Curb Ramps Subtotal:	**$36,300**
Prefab Pedestrian Bridge					
-	Contech 80' x 10' Prefab Express Pedestrian Bridge	LS	1	$117,500.00	$117,500
-	Prefab Wingwalls and Abutments	LS	1	$50,000.00	$50,000
-	Concrete Bridge Deck	LS	1	$40,000.00	$40,000
-	Crane and Bridge Setting	LS	1	$30,000.00	$30,000
-	Class 1 Excavation	CY	584	$50.00	$29,200
-	Soil Borings	LS	1	$10,000.00	$10,000
-	Group III Third Party Bridge Review	LS	1	$10,000.00	$10,000
-	Structure Backfill	CY	524	$65.00	$34,060
				Prefab Pedestrian Bridge Subtotal:	**$320,760**
Pedestrian Bridge ADA Retrofit					
-	Replace Stairs With Ramps (Lumber)	LS	1	$175,000.00	$175,000
				Pedestrian Bridge ADA Retrofit	**$175,000**
Lump Sum Items					
-	Signing and Pavement Markings	LS	1	$25,000.00	$25,000
-	Offset Excavation	LS	1	$25,000.00	$25,000
-	Drainage	LS	1	$10,000.00	$10,000
-	Erosion and Sediment Control	LS	1	$60,000.00	$60,000
0201-0001	Clearing and Grubbing	LS	1	$30,000.00	$30,000
-	Tree Trimming/Removal	LS	1	$30,000.00	$30,000
-	Construction Schedule	LS	1	$2,500.00	$2,500
-	Traffic Control	LS	1	$20,000.00	$20,000
-	Inspection Trailer and Equipment Package	LS	1	$10,000.00	$10,000
-	Microcomputer	LS	1	$6,000.00	$6,000
-	Internal Facilitation	LS	1	$1,000.00	$1,000
-	Unforeseen Water Pollution Control	LS	1	$25,000.00	$25,000
-	Construction Survey and Stakeout	LS	1	$20,000.00	$20,000
				Lump Sum Items Subtotal:	**$264,500**
				Construction Subtotal:	**$1,332,460**
				Construction + Mobilization Subtotal:	**$1,399,090**
-	Mobilization	%	5		$66,630
-	Construction Inspection	%	10		$139,910
-	Contingency	%	10		$139,910
				Overall Construction Cost:	**$1,745,540**
-	Geotechnical	LS	1	$15,000.00	$15,000
-	H&H Analysis	LS	1	$15,000.00	$15,000
-	Trail Design	LS	1	$10,000.00	$10,000
-	Structural Design: TS&L and Ramp	LS	1	$25,000.00	$25,000
-	Survey	LS	1	$5,000.00	$5,000
-	Archeology	LS	1	$5,000.00	$5,000
-	Permitting: E&S and DEP	LS	1	$15,000.00	$15,000
				Design and Permitting Cost:	**$90,000**
				Overall Project Cost:	**$1,835,540**

Notes:

1. Top 8" of soil to be removed during clearing and grubbing. Excavation excludes the 8" removal.
2. Subbase is incidental to the cement concrete sidewalk construction.
3. Prefab bridge, abutments, and wingwalls are design-build by Contech.
4. Concrete bridge deck material to be supplied and installed by contractor.
5. Any landscaping material and labor to be provided by Township after construction.
6. Class 1 Excavation includes surplus material removal.
7. Pricing based on recent PennDOT ECMS history, when available.
8. Pricing current as of August 2022, subject to change.
9. Assumes an inspection office will be provided by the Township.

SOUTH WHITEHALL TOWNSHIP

INTEROFFICE MEMORANDUM

To:	South Whitehall Township Board of Commissioners
From:	Herb Bender, Public Works Manager/Interim Township Manager Donna Zackeru- Lagonia, Purchasing Agent
Date:	August 11, 2022
Subject:	Request to award #2022-06 Rebid – Wehr's Dam Rehabilitation Project
CC:	T. Dickert

One bid was received and opened on Monday, August 8, 2022, at 10:00 a.m. for the Wehr's Dam Rehabilitation Project. This bid was advertised twice in a local publication as required by law. The bid documents were downloaded one-hundred sixty-five times from the PennBid website. CMR Construction was the only respondent to this re-bid.

This was the third time the Township has advertised and open bids due to receiving no bids and receiving bids that were considered non-responsive or higher than our anticipated expense projection.

Public Works and Purchasing reviewed the bid submitted by CMR Construction and received positive feedback from their references. Their bid response was in the amount of $298,825.00 for this project and will be expensed to budget line item 30430003/40800.

In addition to the project work being funded out of the aforesaid line item, $72,260.00 (not to exceed) has also been allocated and encumbered for engineering services/project management by Michael Baker International.

We are respectfully requesting the Board of Commissioners award the contract for the Wehr's Dam Rehabilitation Project at the bid price of $298,825.00, as referenced on the attached bid tabulation.

2022-06 REBID

WEHR'S DAM REHABILITATION PROJECT

	CMR Construction Inc.
TOTAL LUMP SUM BID:	**$298,825.00**
Bid Proposal Form	X
Bid Bond Form	X
Steel Products Act Exemption Request Form	X
Bidder Qualification Form	X
Non-Collusion Affidavit	X
Public Works Employment Verification Form	X
Non-Discrimination Agreement Form	X
Prevailing Wage Act Contract Requirements	X
Submission Checklist Form	X

SOUTH WHITEHALL TOWNSHIP

MEMORANDUM FOR AGENDA ITEMS

TO:	Board of Commissioners
FROM:	Herb Bender
DATE:	August 15, 2022
SUBJECT:	Request to Transfer Budgets in Fire Fund
COPY TO:	

- **Background Information and/or Justification of Transfers:**

  The Fire Fund is in need of budget transfers in order to cover cost for the remainder of the 2022 year. There are a few line items that are already over budget, as well as some that we project will go over budget if transfers do not occur.

- **Action Requested:**

  Move a total of $36,064.68 from 03411003/40800 Capital Contingency into the below listed accounts to cover the over budget line items and projected costs for the remainder of the year.

- **Budget Line Item (if applicable):** *Please indicate approved budget amount for specified project(s).*

1. Move $30,000 from GL 03411003/40800 Capital Contingency to 03411002/40245 Vehicle Maintenance
2. Move $2,500 from GL 03411003/40800 Capital Contingency to 03411202/40402 Oil
3. Move $2,300 from GL 03411003/40800 Capital Contingency to 03411302/40402 Oil
4. Move $500 from GL 03411003/40800 Capital Contingency to 03411002/40260 Small Tools / Minor Equipment Purchases
5. Move $385 from GL 03411003/40800 Capital Contingency to 03411002/40420 Dues/Subscriptions/Memberships
6. Move $379.68 from GL 03411003/40800 Capital Contingency to 03411002/40384 Vehicle/Machinery/Equipment Rental

SOUTH WHITEHALL TOWNSHIP

Agenda Item Details

Meeting	Aug 17, 2022 - Board of Commissioners
Category	10. CORRESPONDENCE AND INFORMATION ITEMS
Subject	A. Boards and Commissions - Informational Items/Vacancies
Access	Public
Type	Information

Public Content

CURRENT VACANCIES ON BOARDS/COMMISSIONS:

1. Civil Service Commission - 2 Alternate Vacancies
2. Green Advisory Council - 3 Vacancy
3. Landscape Shade Tree Commission - 2 Vacancies
4. Park & Recreation Board - 1 Vacancy
5. Environmental Advisory Council - 3 Vacancies

UPCOMING MEETINGS: Details posted on website.

- Thursday, August 18th - Planning Commission, 7:30P
- Monday, August 22nd - Landscape & Shade Tree Commission, 10A
- Wednesday, August 24th - Zoning Hearing Board, 7P
- Friday, August 26th - Movie in the Park
- Monday, September 5th - OFFICES CLOSED, Labor Day Holiday

Administrative Content

Executive Content