BETHEL TOWNSHIP POLLUTANT REDUCTION PLAN (PRP)

PART OF THE MS-4 PROGRAM

Municipal Separate Storm Sewer Program

The stormwater requirements of the Federal Clean Water Act are administered under the Pennsylvania Department of Environmental Protection's Municipal Separate Storm Sewer (MS4) Program.

Pennsylvania has close to 1,000 jurisdictions that are considered small municipal separate stormwater systems (MS4s).

The EPA’s Stormwater Phase II Rule establishes an MS4 stormwater management program that is intended to improve the Nation’s waterways by reducing the quantity of pollutants that stormwater picks up and carries into storm sewers during storm events.

Common pollutants include oil and grease from roadways, pesticides from lawns, sediment from construction sites, carelessly discarded trash, and other illicit discharges.

When deposited into nearby waterways through MS4 discharges, these pollutants can impair waterways, thereby discouraging recreational use of the resource, contaminating drinking water supplies, and interfering with the habitat for fish, other aquatic organisms, and wildlife.

In December 2002, DEP issued a General Permit for use by MS4s that fall under the National Pollutant Discharge Elimination System (NPDES) Phase II program, requiring the implementation of a stormwater management program for minimizing the impacts from runoff. Under the MS4 Program, permittees (including Bethel Township), are required to incorporate the six elements (known as minimum control measures, or MCMs) into their stormwater management programs:

Public Education and Outreach

- Develop, implement and maintain a written Public Education and Outreach Program
- Develop and maintain lists of target audience groups
- Annually publish at least one educational item on the SWM Program
- Distribute Stormwater Educational Materials to the Target Audiences

Public Involvement and Participation

- Develop, Implement and maintain a Written Public Involvement and Participation Plan (PIPP)
- Public comment on any ordinance changes
- Regularly solicit public involvement and participation from the Target audience groups

Illicit Discharge Detection and Elimination

- Develop and maintain a written program for the detection, elimination, and prevention of illicit discharges
- Develop and maintain a map of the regulated MS4 area.
- Up-date map to show roads, inlets, storm sewers, basins, etc
- Outfall Screening
- Enact SWM Ordinance
- Provide Educational Outreach to Public Employees, Business Owners and Employees, Property Owners, the general public, and elected officials about the program to detect and eliminate illicit discharges

Construction Site Runoff Control

- Develop program for construction storm water permitting, construction inspections, and enforcement of installation and maintenance of the necessary E/S controls
- Enact, implement, and enforce an Ordinance for E/S implementation.
- Implement requirements to control waste at construction sites
- Implement Procedures for receipt and consideration of public inquiries and concerns.

Post-construction Stormwater Management in New Development and Redevelopment

- Develop written procedures for storm water BMP’s
- Select BMP’s that minimize water quality impacts
- Insure BMP installation
- Post-Construction SWM requirements
- Low Impact Design
- Operation and Maintenance issues

Pollution Prevention and Good Housekeeping for Municipal Operations and Maintenance

- Inventory facilities and activities
- Develop, implement, and maintain O&M program for Municipal Operations and Facilities
- Employee Training Program

During the five-year permitting period starting in March 2018, if there are impaired streams in a Municipality, the Municipality must reduce sediment pollution loads by 10% over a five-year period. In order to achieve this goal, the Municipality must develop a Pollutant Reduction Program (PRP).

The PRP Program is to be developed by the Municipality and approved by PaDEP. The PRP must include the following information:

- Accurate Map of the municipality's Storm Sewer Shed
- Determine the area and land use types in the Storm Sewer Shed
- Determine the sediment loading in the Storm Sewer Shed
- Establish the 10% reduction value of the sediment loading
- Develop and fund a program to meet the 10% reduction
- Physical work will need to be accomplished – stream bank stabilization, retro-fit SWM Basins, installation of the SWM Facilities, Tree planting, etc.

The PRP shall contain the following:

A. Public Participation

1. The PRP shall be made available for public review.
2. A Public Notice shall be published in a newspaper of general circulation concerning the PRP – where it can be viewed, comment period, etc.
3. Public comments concerning the PRP shall be received by the municipality

B. Map

1. A Map that identifies land uses and/or impervious/pervious surfaces and the storm sewer shed boundary associated with each MS4 that discharges to an impaired waterway.

C. Pollutants of Concern

1. The pollutants of concern for each storm sewershed or the overall PRP Planning Area shall be identified.

D. Determine Existing Loading for Pollutants of Concern

1. Calculations are to be provided to determine the existing loading, in lbs per year, for the pollutant(s) of concern in the PRP Planning Area.

E. BMPs to Achieve the Minimum Required Reductions in Pollutant Loading

1. The municipality must propose the implementation of BMP(s) or land use changes within the PRP Planning Area that will result in meeting the minimum required reductions in pollutant loading within the planning area.

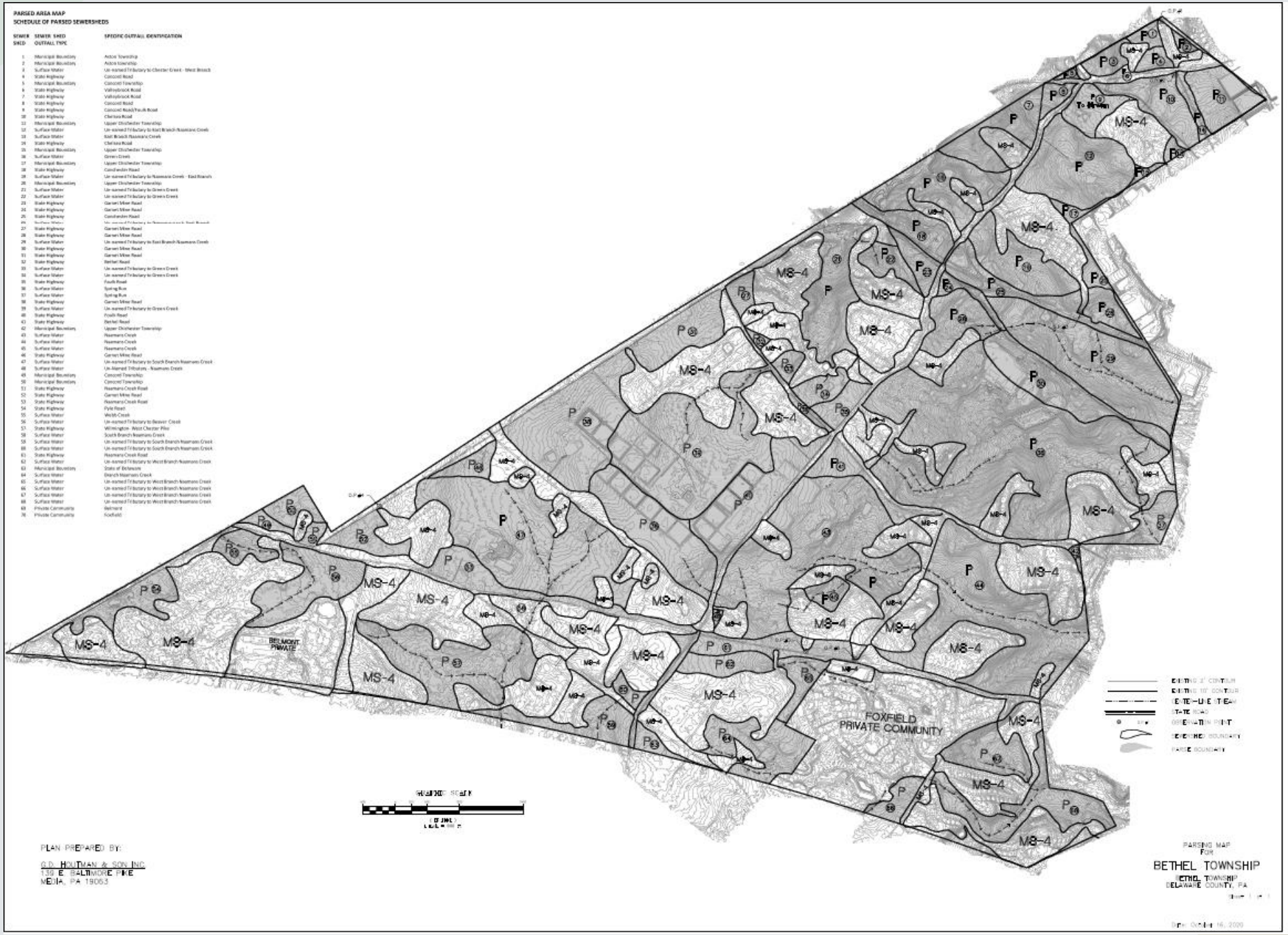
F. Identify the Funding Mechanism

G. Identify Responsible Parties for the Operation and Maintenance (O&M) of the BMPs

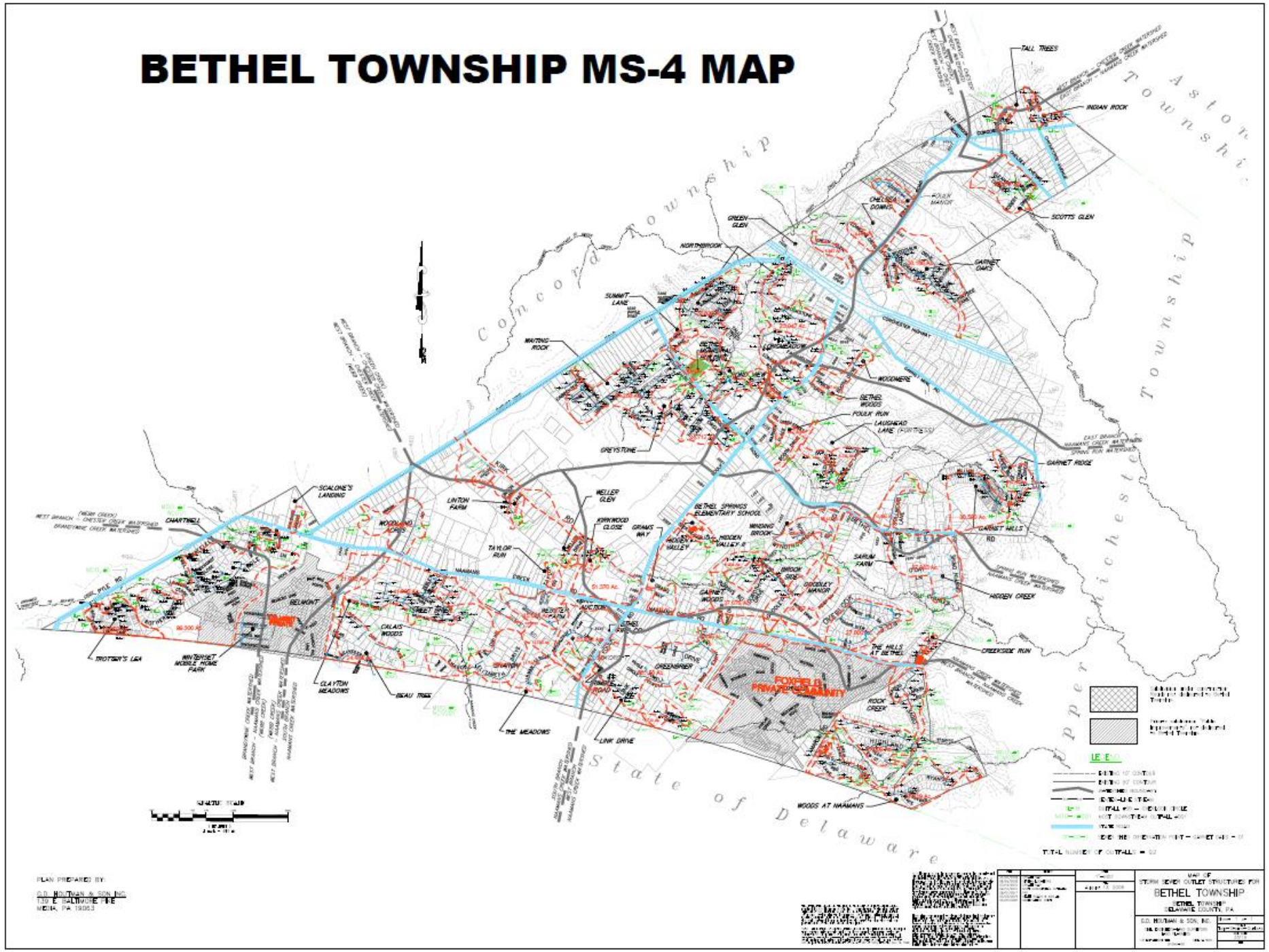
1. The requirements of the MS4 program including the Pollution Reduction program is an unfunded mandate meaning the municipality must fund the expenses related to the MS4 program

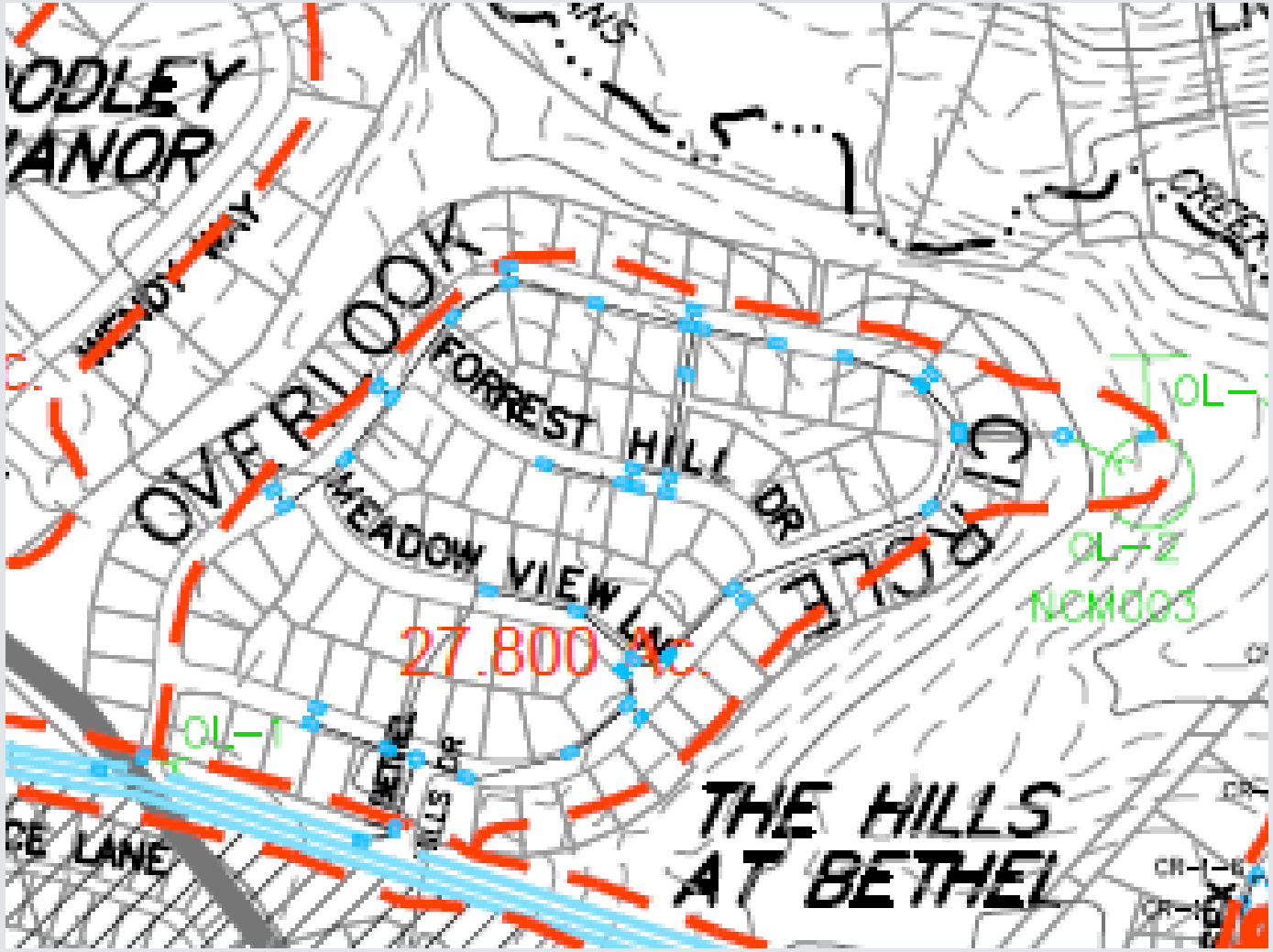
STORM SEWERSHED MAP

- Existing Roads
- Residential and Commercial Developments
- Identify Drainage Areas to all Township Roads or Publically Owned Land


PARSED AREA MAP
SCHEDULE OF PARSED SEWERSHEDS
SEWER SHED
SEWER SHED OUTFALL TYPE
SPECIFIC OUTFALL IDENTIFICATION
MS-4
P
BELMONT PRIVATE
FOXFIELD PRIVATE COMMUNITY
PLAN PREPARED BY:
G.D. HOUTMAN & SON INC
139 E. BALTIMORE PIKE
MEDIA, PA 19063
PARSING MAP
FOR
BETHEL TOWNSHIP
BETHEL TOWNSHIP
DELAWARE COUNTY, PA

BETHEL TOWNSHIP MS-4 MAP




ODLEY
ANOR
OVERLOOK
FORREST HILL DR
MEADOW VIEW LN
CIRCLE
27.800 AC.
OL-1
OL-2
NCMD03
THE HILLS
AT BETHEL
RE LANE

BETHEL TOWNSHIP WATERSHEDS

NAAMANS CREEK WATERSHED

- West Branch
- South Branch
- Main Branch
- Spring Run
- East Branch

WEST BRANCH CHESTER CREEK

- Webb Creek (aka Concord Creek
- Green Creek

BRANDYWINE CREEK

- Un-named Tributary to Beaver Creek

CALCULATE EXISTING POLLUTANT LOADING

1) Determine Area of each Stormsewer Shed
2) Estimate the Impervious Cover in each Stormsewer Shed
3) Establish Sediment Loading for each Stormsewer Shed
    A) Impervious Surface – 1,839 lbs/year/acre
    B) Pervious Surface – 265 lbs/year/acre
4) Compute the required Pollutant Loading Reduction (10%)

DEVELOPMENT	ROAD	STORM SEWER SHED AREA (acres)	IMPERV COVER TYPE	PERCENTAGE OF LAND IN COVER TYPE	IMPERV COVER (%)	SEDIMENT LOADING (lbs)	10% of SEDIMENT Loading
SOUTH BRANCH NAAMANS CREEK							
Sharon	Sharon Drive Atlee Circle Elizabeth Drive	28.09	R-1	100	20	16,287	1,629
The Meadows	Luhman Circle	11.72	R-1 OS	85 15	20 5	5,776 604	578 60
Brookcroft	Brookcroft Lane Brookcroft Place	25.82	R-1 OS	90 10	20 5	13,473 887	1,347 89

WATERSHED	STORM SEWERSHED AREA (acres)	SEDIMENT LOADING (pounds/year)	POLLUTANT LOAD REDUCTION (pounds)
West Branch Naamanns Creek	154	102,834	10,283
South Branch Naamans Creek	227	128,132	12,813
Main Branch Naamans Creek	192	123,347	12,335
Spring Run	97	57,983	5,798
East Branch Naamans Creek	75	51,160	5,116
Webb Creek	31	19,926	1,993
Green Creek	119	132,331	13,233
TOTAL	**895**	**615,713**	**61,571**

PaDEP EFFECTIVENESS VALUES

Wet Ponds – 60%

Dry Detention Basins – 10%

Extended Dry Basins – 60%

Infiltration Practices – 95%

Filtering Practices – 80%

Filter Strips – 56%

Rain Gardens – 55%-80%

Vegetated Channels – 50%-70%

Bioswale – 80%

Permeable Pavement – 70%

Forest Buffers – 50%

Tree Planting – 20%

Street Sweeping – 9%

Stream Bank Restoration – 45lbs/ft/yr

BMP SELECTION

SELECTION FACTORS

1. Cost of Installation
2. Land Acquisition
3. Impact on Residents
4. Access to BMP
5. Effectiveness

RECOMMENDED BMPS

1. Convert Dry Basins to Extended Dry Basins with some Sediment Filtering
2. Stream Bank Stabilization

SELECTED BMPS's – Naamans Creek Watershed

West Branch Naamans Creek	Retrofit Basin at Woods at Naamans 240 feet Stream Bank Stabilization
South Branch Naamans Creek	Retrofit Basin at Sharon Development 285 feet Stream Bank Stabilization
Main Branch Naamans Creek	Retrofit Basin at Hills at Bethel Development 275 feet of Stream Bank Stabilization
Spring Run	Retrofit Basin at Garnet Hills Development 130 feet of Stream Bank Stabilization
East Branch Naamans Creek	Retrofit Basin at Scotts Glen Development 114 feet of Stream Bank Stabilization

SELECTED BMPS’s – Chester Creek Watershed

Webb Creek	Retrofit Basin at Woodland Acres
	100 feet Stream Bank Stabilization
Green Creek	Retrofit Basin at Northbrook Development
	294 feet Stream Bank Stabilization

INITIAL PROJECTS

1) Retrofit Basin at Sharon Development

- Land Owned by Township
- Readily Accessible
- High Effectiveness Ration

2) Stream Bank Stabilization on Township Owned Property

COST ESTIMATE

Retrofit Basin	$43,000.00 per basin
Stream Bank Stabilization	$18,700.00 per 100 ft of Stream