

## 5.0 ASSESSMENT OF CURRENT AND FUTURE FLOWS

### 5.1 CURRENT FLOWS

Wastewater needs are typically assessed in terms of service connections and/or wastewater flows. Current conditions in Whitpain Township are described in the following sections in both terms.

#### 5.1.1 Service Connections

As described in Chapter 4, Whitpain Township provides wastewater collection and conveyance within its municipal borders. However, Whitpain conveys wastewater flows to four agencies for treatment according to topography and natural drainage:

1. East Norriton-Plymouth-Whitpain Joint Sewer Authority (ENPWJSA)
2. Ambler Borough
3. Upper Gwynedd Township Municipal Authority (UGTMA)
4. Whitemarsh Township

The point of treatment provides the basis for defining service areas. Sewer connections in each service area are delineated in Table 5-1 and summarized as follows:

Service Area	Total Properties	Sewer Connections		
		Residential	Commercial	Total
ENPWJSA	5,217	4,694	192	4,886
Ambler Borough	1,900	1,646	20	1,666
UGTMA	79	372	0	372
Whitemarsh Twp.	<u>34</u>	<u>392</u>	<u>0</u>	<u>392</u>
Totals	7,231	7,104	212	7,316

The tabulation confirms two statements from prior chapters: (a) treatment is provided primarily by first two regional authorities and (b) the vast majority of Whitpain is served by public sewers.

In addition to the sewer connections within the designated service areas, there are properties in Whitpain and the adjacent municipalities that receive service through unmetered, intermunicipal connections to sewers along the border streets. These intermunicipal sewer connections are listed in Table 5-2. There is generally a balance in the number of properties served in this manner between Whitpain and the adjacent municipalities.

### 5.1.2 Historic Flow Data

Whitpain Township flows in the ENPWJSA service area are metered at three chambers, as shown schematically in Figure 5-1:

Meter Chamber	Location	Tributary Area
Arch Road	at Saw Mill Run PS (Arch Rd & Johnson Hwy)	Township Line Road PS (A) (Stony Creek basin)
Sheffield Drive	Township Line Road, east of Sheffield Drive	Mermaid Run PS (B) and small gravity area (C)
Walton Road	Township Line Road, west of Walton Road	gravity area generally bordered by Penllyn Pike, Stenton Ave, and Narcissa Road (D)

The Arch Road and Sheffield Drive meter chambers have 18-inch magnetic flow meters. The Walton Road chamber relies on a 10-inch Palmer-Bowlus flume as the primary device with an ultrasonic level sensor.

Total Whitpain flows to the ENPWJSA for the last 15 years (1991 through 2005) are listed in Table 5-3 and are presented graphically in Figure 5-2. Flows through the two larger meter chambers are also presented graphically in Figure 5-2. Key flow criteria for the sewerage facilities are as follows:

Facility	Flow (mgd), according to Criteria		
	5-Year Avg.	Max. 3-Month	Max. Day
Township Line PS	1.026	1.364	4.366
Sheffield Drive Meter	0.642	1.213	3.542
ENPWJSA Total	1.880	2.866	8.559

The maximum 3-monthly and maximum daily flow data in the preceding tabulation represent the highest values that have occurred during the past five years, rather than the 5-year average that is presented in Table 5-3. Another way to analyze the data in Table 5-3 is to present the percentile of occurrence during the past 15 years, as shown in Figure 5-3.

These current flow criteria serve as the baseline for future flow projections.

Flows in the Ambler service area are not metered. Billings by the treatment authority are based on residential units served and population equivalents for commercial, industrial, and institutional users. Residential units in the Ambler service area have slowly increased over the last ten years to 1,538 units in 2005, as shown in Table 5-4 and presented graphically in Figure 5-4.

### 5.1.3 Temporary Flow Metering

Flows in the ENPWJSA and Ambler service areas were further desegregated according to sub-districts by means of temporary flow metering. Flow meters were installed in 19 manholes in the ENPWJSA sewer district and 5 manholes in the Ambler sewer district, as shown schematically in Figures 5-5 and 5-6 respectively. The flow meters were in place from March 13 through May 14, 2003. The temporary flow metering period coincided with the highest monthly flow (10.25 mgd) ever recorded at the ENPWJSA treatment plant (March 2003).

The results of the temporary flow metering are summarized in Table 5-3 and flow charts for the individual sites are included in Appendix B. The temporary flow metering data is compared to the flow data from the permanent flow meters described in the preceding section. The comparisons are presented graphically in Figures 5-7 through 5-10. The following conclusions are drawn from the comparisons:

- ☑ Figure 5-7 indicates that there is good correlation between the temporary flow meter on the Stony Creek interceptor, just downstream of the PA Turnpike (#T-200) and the sum of the six upstream meters on tributary sewers.
- ☑ Figure 5-7 also indicates that there is good correlation between the permanent Arch Road meter on the Township Line pumping station and the sum of the temporary flow meters (#T-200 plus #T-101, 102, 104, 105 and 106) on the Stony Creek interceptor, considering that there are some tributary sewers that were not metered.
- ☑ The temporary flow meter on the Stony Creek interceptor (#T-200) shows similar flow patterns to the permanent meter at the ENPWJSA treatment plant, further suggesting the reliability of this temporary meter (see Figure 5-8).
- ☑ The plots on Figure 5-9 suggest that the temporary flow meter on the Mermaid Run interceptor, just downstream of Jolly Road (#M-400) may have been recording high.
- ☑ Figure 5-10 shows that there is a significant flow difference between the meter on the Prophecy Creek interceptor, just downstream of the Morris Road (#A-100) and the sum of the four upstream meters on tributary sewers that may not be explained by the tributary sewers that were not metered.
- ☑ The flow meter on the Prophecy Creek interceptor (#A-100) recorded slightly higher flows than the downstream meter on the Wissahickon Creek that also receives flows from Lower Gwynedd Township. This is further indication that the meter on the Prophecy Creek interceptor (#A-100) may be inaccurate.

As shown in Table 5-5 and the referenced flow charts, there is generally good calibration between the temporary and permanent flow meters. However, two of the temporary flow meters produced questionable data. This could be due to the inherent inaccuracies of the temporary flow meters and typical sewer conditions (such as grease, solids, etc.) that can affect meter accuracy. Accordingly, the data in Table 5-5 must be analyzed with some technical discretion.

## 5.2 INFILTRATION/INFLOW

### 5.2.1 Analysis

A desktop analysis of infiltration/inflow (I/I) was conducted as part of this study. The results of the analysis are summarized in the following tabulation, which presents maximum monthly I/I flows for the last five years:

Facility	Max. Month I/I Flows		Month
	(mgd)	(gpd/inch-mile)	
Township Line PS	0.897	2,290	Dec-03
Sheffield Drive Meter	1.237	5,430	Apr-05
ENPWJSA Total	2.044	3,040	Apr-05

Compared to a criterion of 6,000 gpd per inch-diameter per mile of sewer, I/I in the overall Whitpain Township system is not excessive. This is likely the result of diligent efforts on the part of the Township to control I/I.

The results of the temporary flow metering were also used to analyze I/I in the various sewer system sub-areas. The analysis implicated certain sewer sub-areas as greater sources of I/I. The sewer sub-areas suspected to have higher I/I quantities are generally the older sections of the system, as might be expected. Based on the analysis, the following sewer sub-areas were targeted for further inspections and corrective actions:

No.	Sewer System Sub-Area Geographic Limits	Approx. Year Installed	Sewer Quant. Length (feet)	No. MH
T-201	Rte 202 on west, Rte 73 on north, Grant Ave & Jackson St on east, and Cherry Lane on south	1970	11,750	37
T-202	Fairview Ave, W of Rte 202; Rte 202 bet. Cherry and Michaels Lanes; and Michaels Lane, E of Rte 202	1960	4,200	20
T-101 & T-104	Center Square Green: Clearview Ave on west, Yost Rd on north, Lafayette Way on east, and Erbs Mill Rd on S	1960	17,000	70
T-102	Mauck Rd on west, Yost Rd on N, Whitwood Dr on east, and Pulaski Dr on south.	1970	9,000	36
M-301 & M-302	Blue Bell Garden: Valley Rd on west, Rte 73 on north, Sunset Dr on east, and Valley Rd on south.	1960	11,350	53
<b>Total Sewer Inspection Recommendation</b>			<b>53,300</b>	<b>216</b>

The sewers recommended for further investigation represent roughly 12% of the total sewer system. Investigations and corrective actions undertaken in the past are described in the following section.

### 5.2.2 Previous Efforts

Whitpain Township has expended considerable effort and expense to identify, correct, and control I/I over the past 30 years. These efforts are summarized in the following capsule descriptions.

1. Infiltration /Inflow Study

Report Date: June 1971

Quantities/Description:

A physical inspection of approximately 85 to 90 percent of the manholes and sewers in the Township at the time was completed.

Results:

- Recommended the internal TV inspection and grouting of sewer lines and the repair of manholes, which was undertaken in 1972

2. Infiltration /Inflow Study

Report Date: June 1982

Period of work: May 1982

Quantities/Description:

Portable meters were placed in 6 key manholes to monitor flow in sewer subareas of the Township Line and Mermaid Run pumping station service areas, which included a total of 206,220 feet of collector sewers.

Results:

- Recommended additional flow metering during high groundwater conditions. Flow metering during this study was conducted in May 1982, which was a dry month.

3. Infiltration /Inflow Study

Report Date: August 1983

Period of work: May and June 1983

Quantities/Description:

Portable meters were re-installed in the same 6 key manholes of the Township Line and Mermaid Run pumping station service areas as was done in the previous study.

Results:

- Infiltration rates were determined to be nonexcessive according to USEPA guidelines.
- However, the study concluded that the inflow measured was excessive and recommended the physical inspection of selected sewer subareas.

4. Manhole Inspections

Period of work: July through November 1985

Quantities/Description:

86 of 161 total manholes were inspected in three sewer subareas of the Township Line and Mermaid Run pumping station service areas.

Results:

- 28 of the 86 manholes inspected were found to have problems, such as leaking walls, leaking pipe or channels, and leaking frame/ covers.

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5. Flow Monitoring Study

Period of work: November 1985 through February 1986

Quantities/Description:

Portable meters were installed and then relocated, after analysis, to isolate I/I problems. Meters were installed at 14 locations for varying times during the study period.

Results:

- After reviewing metering data, the Township decided to undertake the comprehensive metering program described in the subsequent summary to identify and isolate I/I quantities in the Township Line and Mermaid Run pumping station service areas.

6. Infiltration /Inflow Study for the Lower Township Sewer System

Report Date: August 1986

Period of work: March through April 1986

Quantities/Description:

Portable meters were placed in 24 key manholes to monitor flow in 26 sewer subareas of the lower section of the Township, which included a total of 206,460 feet of sewers.

Results:

- About 75 percent of the I/I flows are located in 45 percent of the lower Whitpain sewer system.
- Flows in excess of 4.5 mgd cause surcharging at the upper end of the Plymouth/Whitpain Interceptor.
- Most of I/I is rain-induced infiltration.
- Major problem sewers are interceptors along streams and highly traveled roadways (Routes 202 and 73).
- Recommended construction of Arch Street force main as most economical long-range solution to problem.

7. Infiltration/Inflow Flow Isolation Study

Report Date: July 23, 1987

Period of work: March through April 1987

Quantities/Description:

Project included the flow isolation of 82,190 feet of sewer pipe, segment by segment, and the physical inspection of the 390 manholes in the project area. This work was conducted pursuant to the August 1986 I/I Study.

Results:

- 72 percent of the total infiltration is located in the problem segments, which represent 9 percent of the total pipe inspected.
- Infiltration rates are significantly higher in problem segments than in the overall sewer subarea.
- 17 percent (68) of 390 manholes inspected had some degree of infiltration.
- Report recommended the TV inspection of 23,600 feet of sewer to identify physical conditions causing I/I flows.

8. Contract No. 21 - Sanitary Sewer Inspection and Repair  
Contractor: Jet Vac Service & Equipment, Inc.  
Period of work: May through August 1988  
Quantities/Description:  
Work consisted of the internal closed-circuit television inspection of 23,625 feet of problem sewers identified in the July 1987 Flow Isolation Study. The inspected sewers ranged in diameter from 8 to 18 inches in diameter and are located in the service areas of the Township Line and Mermaid Run pumping stations. The purpose of the work was to identify problems with house laterals, structural problems in sewer mains, and leaks at pipe joints and manhole connections. The contract also included the pressure testing of sewer joints and the repair of 52 manholes.
9. Report on TV Inspection of Selected Sewer Segments  
Report Dates: September 27, 1988 and November 22, 1988  
Quantities/Description:  
Report summarized the results of the TV inspection of 23,600 feet of sanitary sewer in Contract 21 and recommended future action.  
Results:  
  - House laterals accounted for 43% of infiltration measured in Flow Isolation survey.
  - Sewer main leaks accounted for 13% of infiltration measured in Flow Isolation survey.
  - Structural problems varied from hairline cracks to collapsed pipe and were found in one out of 640 feet of pipe inspected.
  - Sewer joint test failures occurred in 6 percent of joints tested, but in some areas failures were as high as 13-17 percent.  
Recommendations:  
Report recommended (1) excavation and repair of major structural problems at 14 locations, (2) internal pressure grouting of leaking joints and minor vertical cracks in 4,900 feet of sewer, and (3) complete replacement of 2,400 feet of sewer.
10. Contract No. 22 - Sewer Rehabilitation for Whitpain Township  
Bid Date: June 30, 1989  
Period of work: May 24 through June 2, 1989  
Quantities/Description:  
Pursuant to the recommendations in the November 22, 1988 report, work consisted of (1) replacement of 2,250 feet of existing 8- and 12-inch sanitary sewers, including reconnecting existing laterals, (2) excavation and repair at 9 locations, (3) replacement of 8 manholes, (4) grouting of 18 existing manholes, (5) pressure testing of 700 pipe joints in 8-inch and 18-inch sewers and the grouting of defective joints.
11. Contract 25 - Sanitary Sewer TV and Grout Contract  
Contractor: Tri-State Grouting, Inc.  
Period of work: July through November 1992  
Quantities/Description:  
Work included the internal closed-circuit television inspection of the older sanitary sewers in the Ambler service district. The inspected sewers included 8, 10, and 15-inch pipes, which were originally constructed circa 1961 with asbestos cement pipe.

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12. Contract No. 30 - Sewer Relining in Ambler District  
Bid Date: May 14, 1993  
Contractor: Insituform East, Inc.  
Period of work: June through July 1993  
Quantities/Description:  
Work consisted of the relining (with *Insituform*) of approximately 3,100 feet of 10-inch asbestos cement pipe primarily located in Butler Pike, north of Skippack Pike. The replaced sewer was identified in Contract 25 to be in a severely deteriorated state.
13. Contract No. 32 - Sewer Relining in Blue Bell Glen Subdivision  
Bid Date: April 14, 1995  
Contractor: Hampton CF Corporation  
Period of work: August through September 1995  
Quantities/Description:  
Work consisted of the relining (with Hampton CF *Superliner*) of approximately 2,390 feet of 8-inch pipe and the repair of selected laterals located in an older residential development upstream of the Beale Road pumping station.
14. Contract No. SF-00-2: Skippack Pike Sanitary Sewer Relining  
Bid Date: September 2000  
Contractor: AllState Power Vac, Inc.  
Period of work: October 2000 through February 2001  
Quantities/Description:  
Work consisted of the relining of 4,265 feet of 8-inch sewer in Skippack Pike (PA Route 73) from Village Circle, just east of Penllyn Pike to the Prophecy Creek, just east of Walton Road. The sewer is downstream of the Beale Road pumping station discharge.
15. Miscellaneous Township Work  
Agent: Whitpain Township forces  
Period of work: summer of 2004  
Quantities/Description:  
Work completed to improve the sewer system, included (a) televising the sewers in the Highgate community at the southeastern corner of Route 73 and Penllyn Pike, (b) televising the sewers in the Chatham development, northwest of Township Line Road and Penllyn Pike, and (c) installing watertight manhole covers on the Wissahickon interceptor behind Batleson Road.
15. Corrective Action Plan  
Agent: Whitpain Township forces  
Period of work: first 3 quarters of 2005  
Quantities/Description:  
As part of a Corrective Action Plan implemented as a result of a sewer connection prohibition imposed by the PADEP on the ENPWJSA system, Whitpain Township has completed inspections and rehabilitative work on its sewer system. The reported efforts completed through the first three quarters of 2005 have included (a) televising roughly 59,600 feet of sewers and (b) inspecting approximately 255 manholes in the service area tributary to the ENPWJSA treatment plant.



### 5.2.3 I/I Control Plan

Correction efforts on existing sewers will continue and new sewers are expected to have nearly watertight conditions. However, these benefits may be offset by gradual deterioration of the sewer system over the future. The increase in infiltration/inflow (I/I) over time should be avoided to some degree if the Township maintains its aggressive policy regarding system maintenance and the prohibition of illegal connections such as sump pumps, down-spouts, etc.

As described above, I/I control efforts completed as part of this plan have included:

- ☒ Desktop I/I analysis of flow records
- ☒ Temporary flow monitoring of sewer system sub-areas

The scope of work for subsequent I/I Control Plan activities includes:

1. **Internal TV inspection of approximately 10 to 20% of the sewer lines annually.** As a matter of routine maintenance, the Township intends to internally televise roughly 10 to 20% of the sewer system each year to identify potential sources of I/I and/or other problems.
2. **Physical inspection of all manholes** in the sewer system (over 2,500 MH). Low-lying manholes will be considered for insert dishes to reduce surface inflow during heavy rains.
3. **Repairs or replacement of public sewers** or private laterals, as identified by the inspections, will be made as funds permit or in the next fiscal year. Repetition of this annual process of TV inspection and repairs should improve the collection system and reduce I/I.
4. **Flow Isolation of sewer system sub-sections** will be used to (a) prioritize subsequent I/I investigative actions (b) provide baseline flow data upon which to evaluate subsequent I/I corrective efforts and (c) locate inflow sources. Major sewer system sub-sections will be flow isolated with hand-held weirs during storm events.
5. **Identify and eliminate illegal sewer connections.** The Township will enact an ordinance requiring inspection and removal of sump pumps, floor drains and other illegal sewer connections prior to the transfer of existing houses and the issuance of use & occupancy permits.
6. **Coordinate sanitary sewer rehabilitation with Township road paving projects.** The Township will replace sewer lines in conjunction with road repairs and other improvements throughout the township. Sewers will be inspected prior to the Township paving any roads. Appropriate repairs or replacement of the sewers will be made. This program will offer the cost savings of repaving the road after sewer rehabilitation.

Initial efforts will be focused on the older portions of the sewer system that were constructed in the mid 1960s, since these portions are more likely to be affected by I/I than newer portions of the system. The program will proceed on a step-by-step basis with intermediate decision points to re-adjust the direction of the program.

### 5.3 WASTEWATER FLOW PROJECTIONS

#### 5.3.1 Future Development Potential

*The Whitpain Township Open Space Plan*, prepared by E. Van Rieker in November 1995 inventoried existing open space and vacant land in the Township, as shown in Figure 5-11. The report identified open land according to three categories:

1. **Vacant Land** includes parcels of one acre and larger, on which there is surplus property that could be subdivided. This land represents the primary potential for future development.
2. **Temporarily Protected Open Space** includes Act 319/515 lands, golf courses, and privately owned recreation lands. These lands have the potential for future development and are included in the projection of the maximum build-out population.
3. **Permanently Protected Open Space** is publicly and privately owned park land and open space. This land has no potential for future development.

Based on an inventory of open space and vacant land in the Township, as shown in Table 5-6, projections have been prepared based on the following summary of available land:

Category	Developable Land (acres), according to Sewer District	
	ENPWJSA	Ambler
Vacant Land	664	484
Temporarily Protected Open Space	<u>341</u>	<u>679</u>
Total	1,005	1,163

For purposes of this study, the development potential and ultimate population for the Township, as determined in Table 5-6, assumes that private golf courses and clubs, including Cedarbrook and Meadowlands Country Clubs and the Mermaid Swim Club, can be developed. Conversely, temporarily preserved open space from institutions, such as public schools and churches, is not included in the estimate of future development.

The projected future needs for the Township are presented in Table 5-7 and are based on the following assumptions:

- ✓ full build-out of vacant land in accordance with the current zoning provisions (defined in the subsequent tabulation as "Future Build-Out"),
- ✓ development of half ( $\frac{1}{2}$ ) of the temporarily preserved open space in accordance with the current zoning provisions, and
- ✓ provision of public sewer service to all those properties that currently rely on on-lot disposal systems (OLDS).

The projected future needs for the Township are based on (a) full build-out of vacant land and (b) ultimate needs, as detailed in Table 5-7 and summarized as follows:

Component	Sewer Service Units (EDU)		
	Subtotals by Service Area		
	ENPWJSA	Ambler	Total
Current Connections	6,634	1,670	8,304
Completion of Present Development			
Vacant Land	<u>1,443</u>	<u>246</u>	<u>1,689</u>
<b>Future Build-Out</b>	<b>8,077</b>	<b>1,916</b>	<b>9,993</b>
Existing Properties w/ OLDS	135	156	291
Temporary Open Space	469	438	907
<b>Projected Ultimate Needs</b>	<b>8,446</b>	<b>2,292</b>	<b>10,738</b>

The Whitpain Township Open Space Plan also reviewed non-residential growth expectations and concluded that (1) there are no additional properties being considered for the office/administrative nor the industrial zoning districts and (2) there are no substantial changes or expansions contemplated for the commercial and business districts. However, there have been more recent plans discussed to redevelop the Unisys property and projections are included in Table 5-6.

### 5.3.2 Flow Projections

There are limited remaining vacant lots available for development within Whitpain Township, as indicated previously in Table 5-6. Additional future flows are projected in Table 5-7 and amount to slightly more than 0.6 mgd or roughly 25 percent of current average flows. These future flows, which are based on the Township approaching full build-out, are delineated in Table 5-7.

As discussed in Section 5.1.2 and shown previously Figure 5-3, the relationship between average annual flows and maximum 3-month flows varies from year to year depending on several factors. Therefore, the factor (maximum 3-month to average annual) used to estimate future maximum 3-month flows depends on the degree of probability or reliability that is selected. For example, if a factor is selected that is based on the average of historic data, it can be anticipated that the maximum 3-month flows will exceed the selected capacity half of the years when design conditions are reached. Examples of projections based on selected percentiles are shown as follows:

Percentile	Peaking Factor (Maximum 3-Month/Average)	Future Needs (mgd) (Maximum 3-Month)
0.5	1.33	3.1
0.7	1.43	3.3
0.9	1.54	3.5

Whitpain Township has decided to be conservative in estimating its future maximum 3-month hydraulic needs in order to ensure that it does not exceed its allocated capacity. Accordingly, Whitpain has selected a factor based on the 90<sup>th</sup> percentile of data for the past 14 years (1992-2005).

These projections of future needs for the two primary sewer districts in Whitpain Township are projected in Table 5-7 and may be summarized as follows:

Flow Criteria	Projected Future Needs (mgd)	
	ENPWJSA	Ambler
Current Flows:		
Average	1.87	0.50
Max. Month	2.93	
Ultimate Needs:		
Average	2.37	0.67
Max. Month	3.50	
Current WWTP Capacity Allocation	3.1	0.7

**TABLE 5-1  
SUMMARY OF SEWER CONNECTIONS  
ACCORDING TO SEWERAGE SERVICE AREAS**

Area No.	Sewerage Basin	Total #Parcels			No. of Units w/ Public Sewers 2005		
		Resid.	Comm.	Total	Resid.	Comm.	Total
<b>E.N.P.W.J.S.A. TREATMENT SYSTEM</b>							
A	Twp. Line Road P.S.	3,249	97	3,346	2,994	86	3,080
B	Mermaid Run P.S.	1,507	83	1,590	1,485	82	1,567
C	Sheffield Meter - Gravity	40	3	43	38	3	41
D	Walton Road Meter	227	21	248	196	21	217
E	Narcissa Road P.S.	<u>44</u>	<u>0</u>	<u>44</u>	<u>35</u>	<u>0</u>	<u>35</u>
<b>E.N.P.W.J.S.A. Totals</b>		<b>5,067</b>	<b>204</b>	<b>5,271</b>	<b>4,748</b>	<b>192</b>	<b>4,940</b>
<b>(EDU)</b>					<b>4,748</b>	<b>1,886</b>	<b>6,634</b>
<b>AMBLER TREATMENT SYSTEM</b>							
1	Prophecy Creek	1,616	16	1,632	1,504	15	1,519
2	Willow Run	177	5	182	125	5	130
3	Wissahickon Creek- upper	<u>86</u>	<u>2</u>	<u>88</u>	<u>21</u>	<u>0</u>	<u>21</u>
<b>Ambler Totals</b>		<b>1,879</b>	<b>23</b>	<b>1,902</b>	<b>1,650</b>	<b>20</b>	<b>1,670</b>
<b>(EDU)</b>					<b>1,650</b>	<b>477</b>	<b>2,127</b>
<b>UPPER GWYNEDD TREATMENT SYSTEM</b>							
		79	0	79	79	0	79
<b>WHITEMARSH TREATMENT SYSTEM</b>							
		34	0	34	34	0	34
<b>TOWNSHIP TOTALS</b>							
<b>(EDU)</b>		<b>7,059</b>	<b>227</b>	<b>7,286</b>	<b>6,511</b>	<b>212</b>	<b>6,723</b>
					<b>6,511</b>	<b>2,363</b>	<b>8,874</b>

Source: Whitpain Township GIS analysis

**TABLE 5-2  
SUMMARY OF UNMETERED INTERMUNICIPAL SEWER CONNECTIONS**

Municipality Location/Description	Receiving Party	Connections (EDU)		Billing Agency
		Whitpain	adjacent municipality	
<b>East Norriton Twp.</b>				
Twp. Line Rd. (W of RR tracks)	E. Norriton	<u>4</u>		Whitpain
Twp. Line Rd. (@ Erbs Mill Rd)	Whitpain		<u>4</u>	Whitpain
<b>Totals: East Norriton Twp.</b>		<b>4</b>	<b>4</b>	
<b>Plymouth Twp.</b>				
Twp. Line Rd. (bet. Jolly & Walton Rds)	Plymouth	10.2		Whitpain
Governor Estates & area		<u>35</u>		Whitpain
Twp. Line Rd. commercial (near Jolly Rd)	Whitpain		52.2	Plymouth
Twp. Line Rd. residential (near Butler Pk)			<u>4</u>	Whitpain
Twp. Line Rd, near Sheffield Dr.			<u>22</u>	Plymouth
<b>Totals: Plymouth Twp.</b>		<b>45.2</b>	<b>78.2</b>	
<b>Whitemarsh Twp.</b>				
Hamptons, Butler Pike (Elliott tract)	Whitpain		8	Whitpain
potential future connections			<u>18</u>	
<b>Totals: Whitemarsh Twp.</b>		<b>0</b>	<b>26</b>	



**TABLE 5-3**  
**ANNUAL WHITPAIN FLOWS TO E.N.P.W.J.S.A. PLANT**

Year	Service Base (EDU)			Hydraulic Loadings					
				Average Flow			Max. 3-Month Flow		
	Resid.	Non-Resid.	Total	Total (mgd)	Unit Flow (gpd/EDU) Residential	Unit Flow (gpd/EDU) Total	Total (mgd)	Unit Flow (gpd/EDU)	Peaking Factor
<b>Past Loadings</b>									
1992	3,643	1,297	4,940	1.429	392	289	1.615	327	1.13
1993	3,775	1,297	5,072	1.775	470	350	2.753	543	1.55
1994	3,950	1,297	5,247	1.737	440	331	2.600	496	1.50
1995	4,098	1,736	5,834	1.438	351	246	1.640	281	1.14
1996	4,257	1,765	6,022	2.469	580	410	3.379	561	1.37
1997	4,461	1,774	6,235	1.764	395	283	2.292	368	1.30
1998	4,535	1,777	6,312	1.898	419	301	2.969	470	1.56
1999	4,594	1,809	6,403	1.659	361	259	1.918	300	1.16
2000	4,649	1,842	6,491	1.982	426	305	2.786	429	1.41
2001	4,657	1,874	6,531	1.903	409	291	2.819	432	1.48
2002	4,670	1,875	6,545	1.473	315	225	1.696	259	1.15
2003	4,671	1,875	6,546	1.949	417	298	2.150	328	1.10
2004	4,694	1,879	6,573	2.002	426	305	2.326	354	1.16
2005	4,748	1,886	6,634	2.010	423	303	2.866	432	1.43
Average (1992-current)				1.820	416	300	2.415	399	1.32
5-Year Avg.				1.867	398	284	2.371	361	1.26



## PAST WHITPAIN FLOWS TO E.N.P.W.J.S.A.

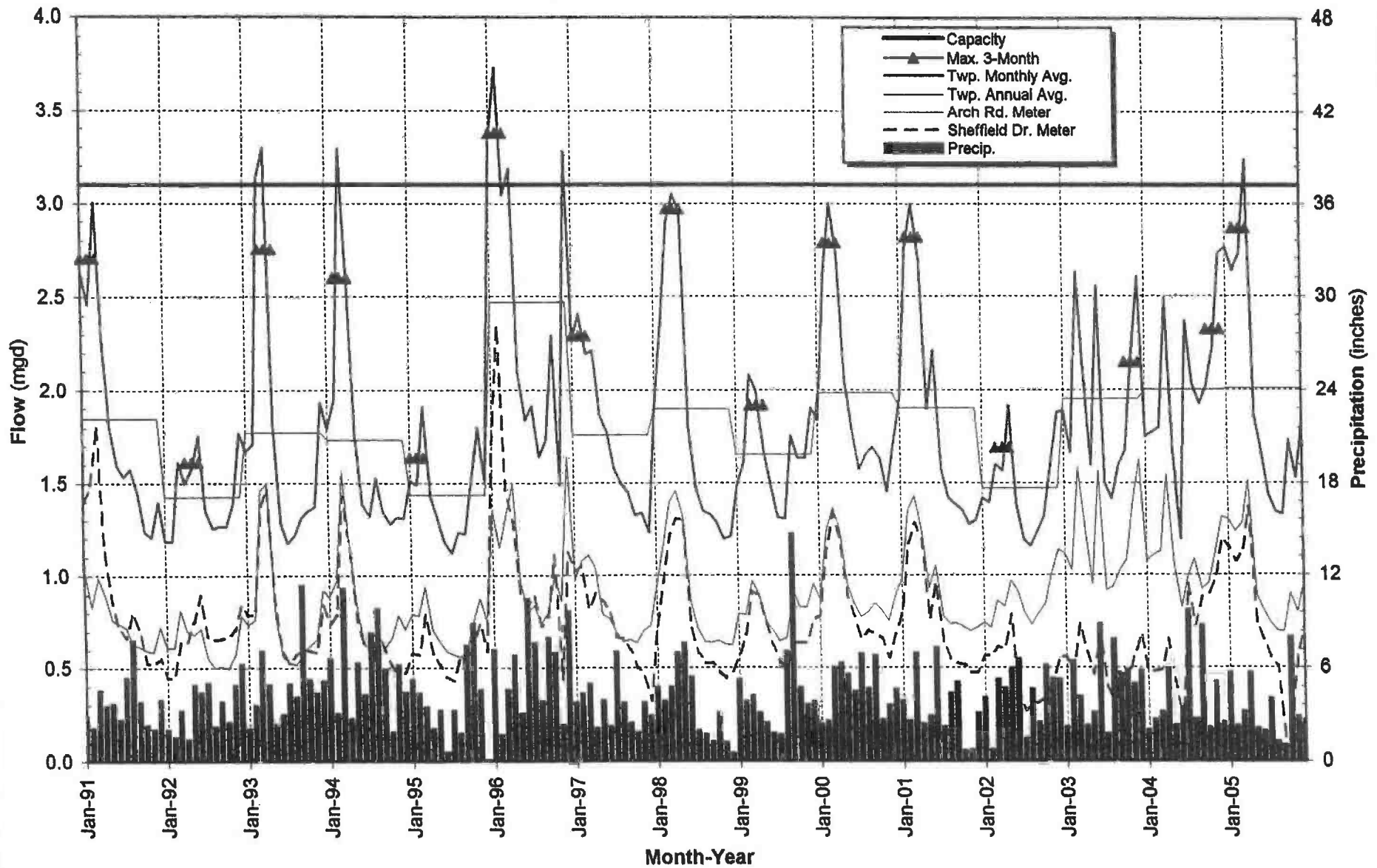


FIGURE 5-2:  
PAST WHITPAIN FLOWS TO E.N.P.W.J.S.A. SYSTEM

## Probability of Max. 3-Month Flows

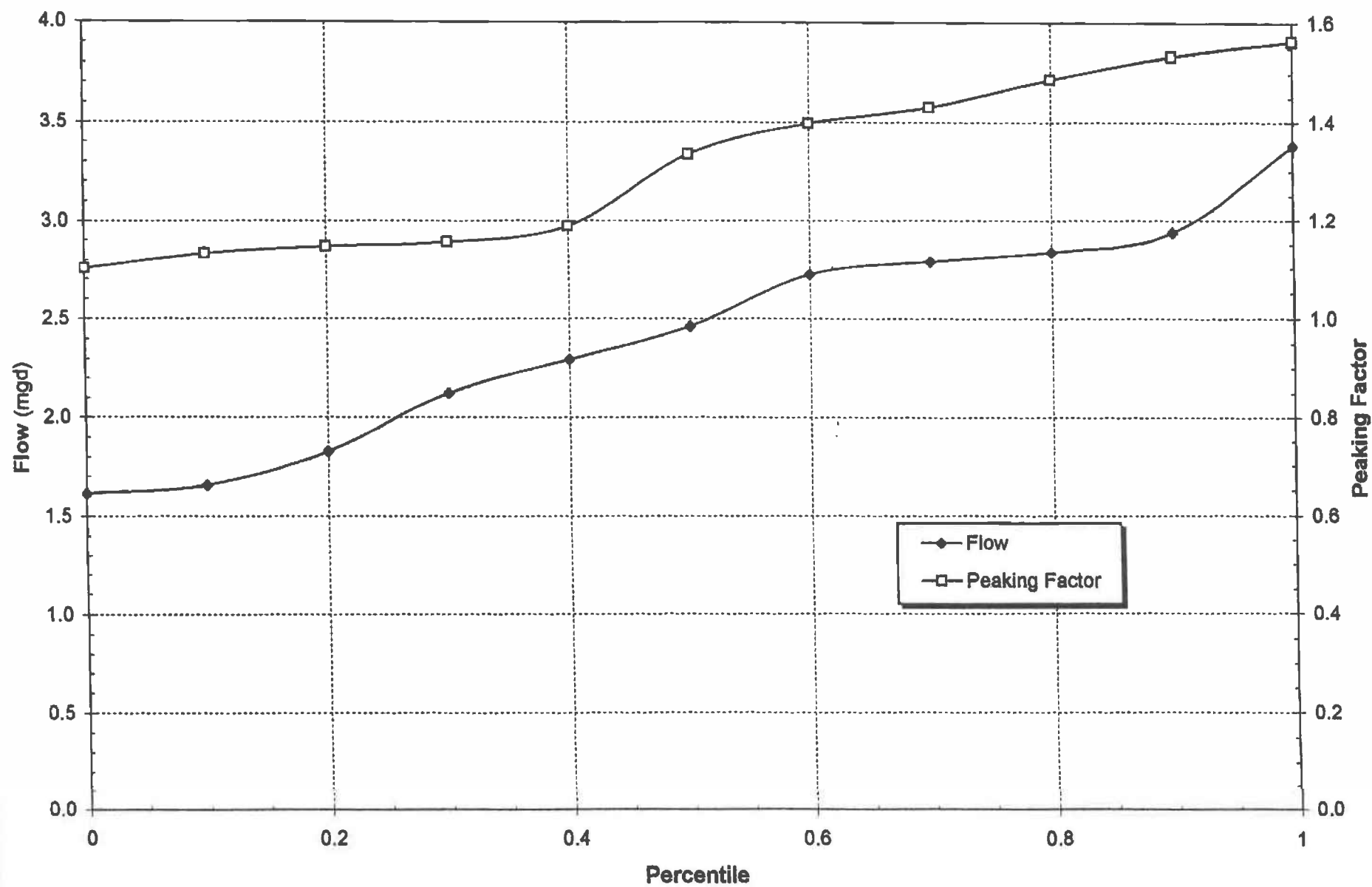


FIGURE 5-3:  
PROBABILITY OF MAX. 3-MONTH FLOWS

**TABLE 5-4  
SEWER CONNECTIONS TO AMBLER TREATMENT SYSTEM**

Year	Residential Units	Non-Residential Connections			Totals	
		Commercial	Industrial	Institutional	Pop.Equiv.	EDU
1987	1,077	36	1	1	4,200.4	1,200
1988	1,195	36	1	1	4,613.4	1,318
1989	1,313	37	1	1	5,036.1	1,439
1990	1,350	38	1	1	5,179.0	1,480
1991	1,377	41	1	1	5,273.1	1,507
1992	1,400	41	1	1	5,355.1	1,530
1993	1,409	42	1	1	4,504.3	1,564
1994	1,412	42	1	1	4,524.6	1,571
1995	1,424	42	1	1	4,559.2	1,583
1996	1,456	42	1	1	4,654.7	1,616
1997	1,466	45	1	1	4,698.4	1,631
1998	1,475	45	1	1	4,740.1	1,646
1999	1,478	45	1	1	4,736.7	1,645
2000	1,484	45	1	1	4,754.2	1,651
2001	1,510	45	1	1	4,313.2	1,698
2002	1,523	45	1	2	4,332.4	1,706
2003	1,528	46	1	1	4,355.2	1,715
2004	1,535	45	1	1	4,375.5	1,723
2005	1,538	45	1	1	4,379.1	1,724

**Source:** Whitpain Township, annual *Report of Population Equivalents for the Ambler Jointure*

**Notes:** (1) Population Equivalent and EDU are based on the following persons per Residential Unit:

1992 and prior years: 3.50 persons/EDU

1993 through 2000: 2.88 persons/EDU

2001 and later years: 2.54 persons/EDU

(2) Whitpain Township capacity in the Ambler WWTP is based on a  
population equivalent of 7,000 or 2,756 EDU

**TABLE 5-4  
SEWER CONNECTIONS TO AMBLER TREATMENT SYSTEM**

Year	Residential Units	Non-Residential Connections			Totals	
		Commercial	Industrial	Institutional	Pop.Equiv.	EDU
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1988	1,195	36	1	1	4,613.4	1,318
1989	1,313	37	1	1	5,036.1	1,439
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**Notes:** (1) Population Equivalent and EDU are based on the following persons per Residential Unit:

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(2) Whitpain Township capacity in the Ambler WWTP is based on a  
population equivalent of 7,000 or 2,756 EDU

## WHITPAIN TOWNSHIP CONNECTIONS TO AMBLER SYSTEM

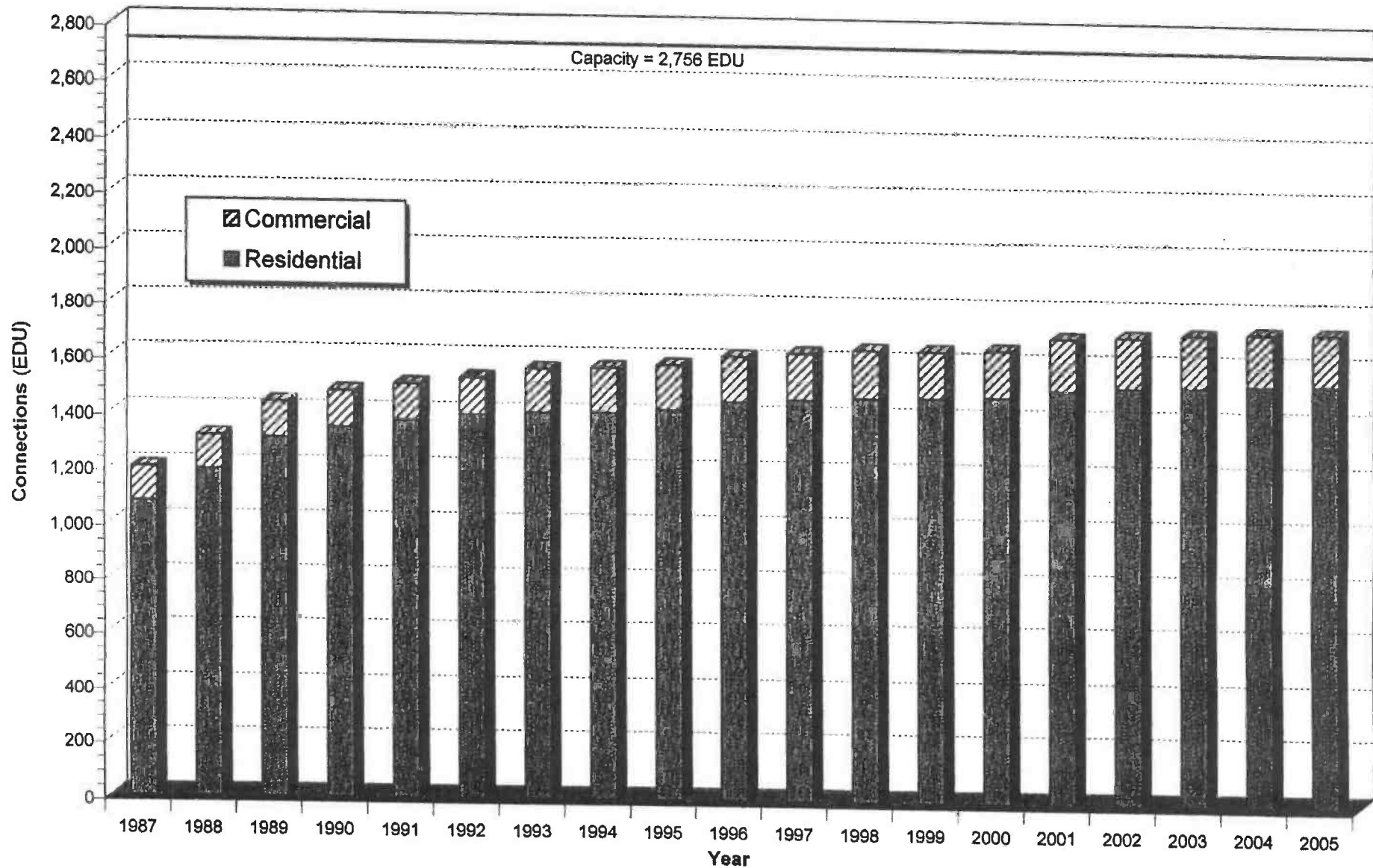


FIGURE 5-4:  
WHITPAIN CONNECTIONS TO AMBLER SYSTEM



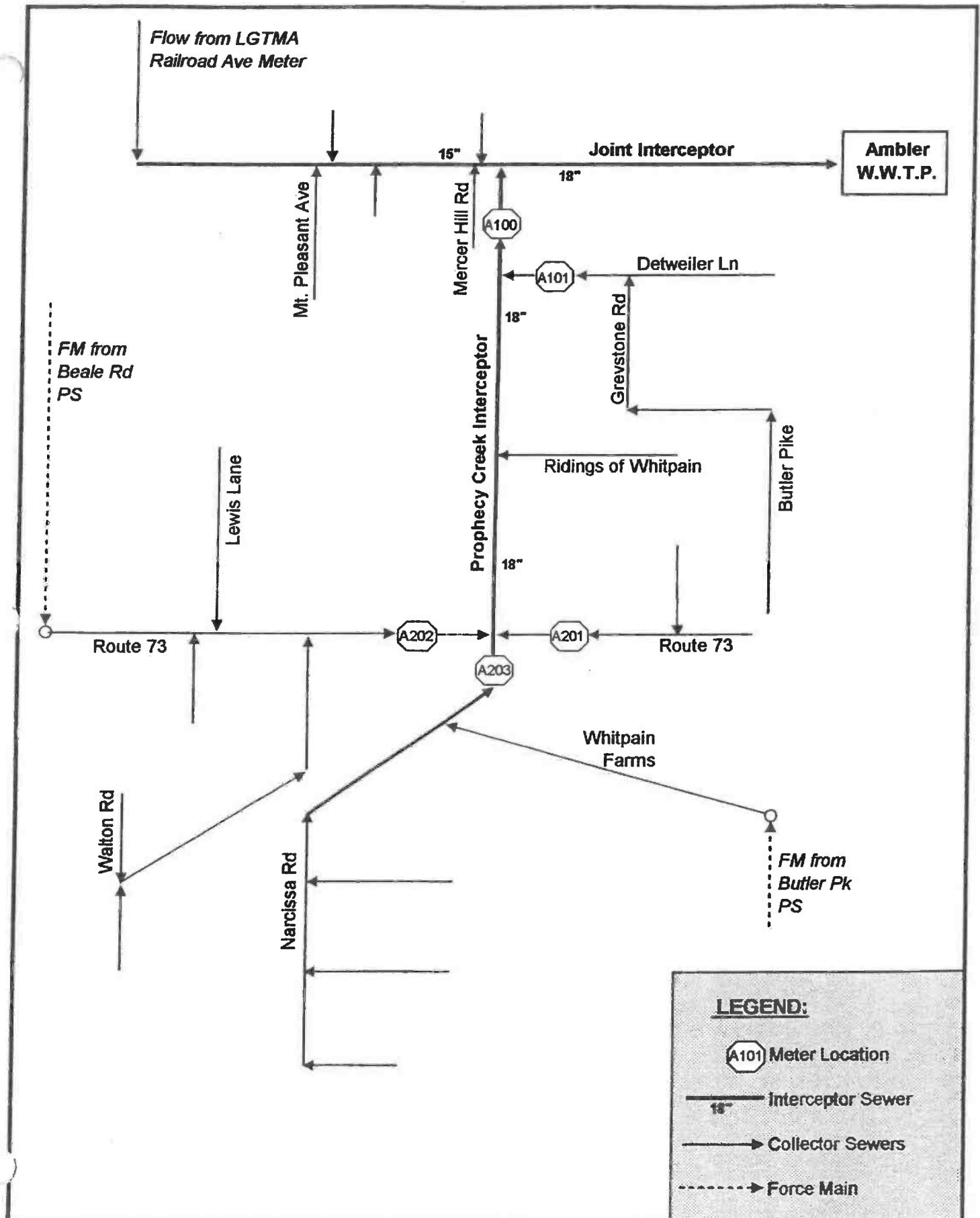


FIGURE 5-6: SCHEMATIC PLAN OF AMBLER SEWER DISTRICT METERING

**TABLE 5-5**  
**SUMMARY OF TEMPORARY FLOW METERING**

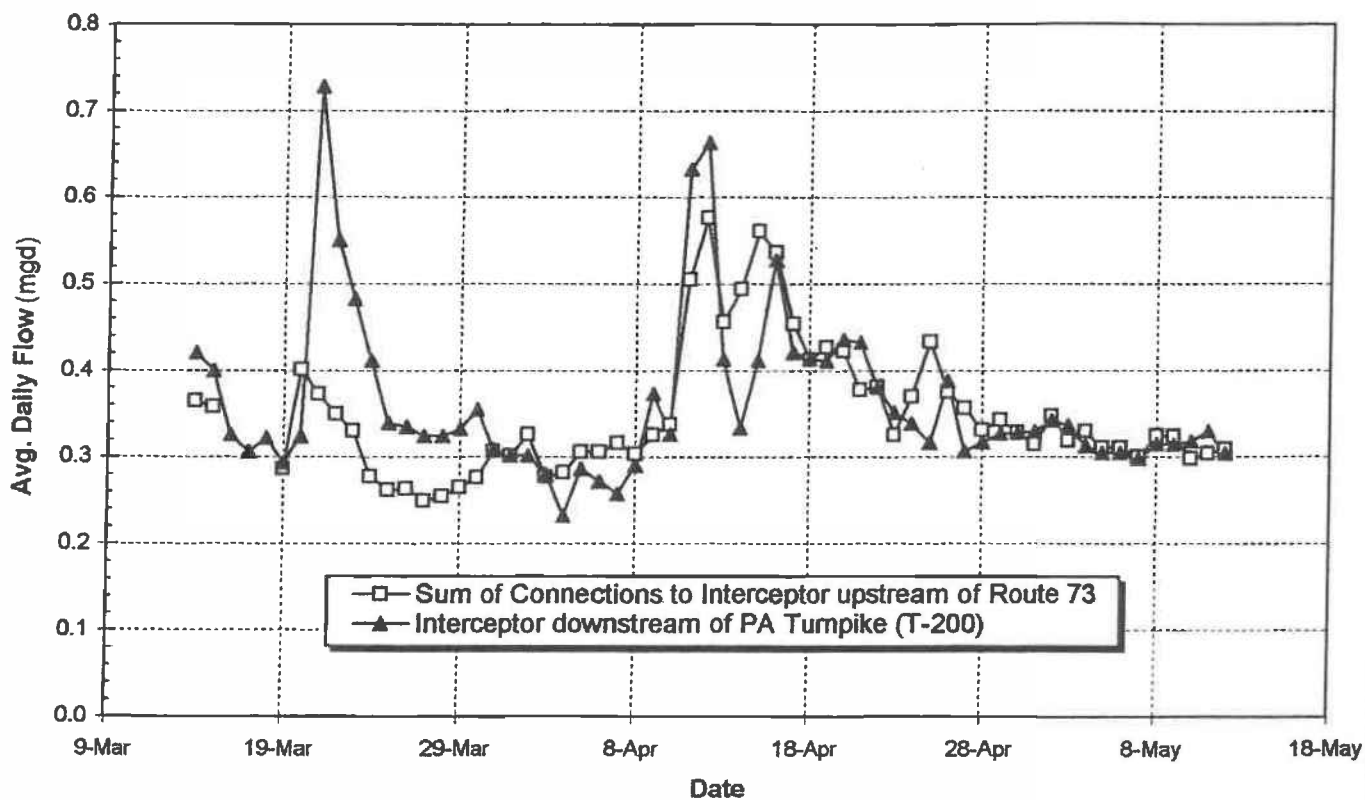
Sewer System Sub-Area		Flow (mgd)			Peak Factors		Unit Flow	
No.	Description	Average	Max. Day	Peak Inst.	Max. Day	Peak Inst.	Units (EDU)	(gpd/EDU)
ENPWJSA: Stony Creek Basin								
T-301	Stony Creek Interceptor @ MontCo CC	0.085	0.121	0.314	1.43	3.70	149	571
T-302	Rte 202 sewer, N of Rte 73	0.042	0.070	0.279	1.65	6.57	173	246
T-303	behind Center Sq shop ctr, E of Rte 202	0.078	0.143	0.210	1.82	2.69	318	246
T-304	Rte 73 sewer, W of Rte 202	0.074	0.101	0.163	1.36	2.20	302	246
T-201	Rte 73 sewer, E of Rte 202 in Reed's lot	0.053	0.213	0.432	4.01	8.13	142	374
T-202	Fairview Ave sewer, W of Rte 202	0.017	0.034	0.128	2.04	7.56	30	563
Subtotal	Stony Creek Interceptor @ Rte 73	0.350	0.576		1.65		965	363
T-200	Stony Creek Interceptor, W of PA Tpk	0.363	0.728	1.296	2.01	3.57	1,589	228
T-101	Yost Rd sewer, E of interceptor	0.145	0.213	0.389	1.46	2.68	93	1,564
T-102	Pulaski Dr sewer, W of interceptor	0.154	0.301	0.883	1.95	5.72	117	1,320
T-104	Clearview Ave sewer, at Thayer Dr	0.050	0.104	0.183	2.06	3.65	154	326
T-105	No. Wales Rd interceptor	0.078	0.128	0.654	1.64	8.37	909	86
T-106	Twp. Line Rd sewer @ PS	0.117	0.177	0.293	1.51	2.51	289	404
Subtotal	downstream connections to interceptor	0.544	0.714		1.31		1,562	348
op. time	N. Wales Rd Pump. Sta.	0.098	0.148		1.51		800	123
Total	Twp Line Rd PS (= T-200 + Σ T-100s)	0.907	1.349		1.49		2,945	308
PS meter	Twp Line Rd Pump. Sta.	1.263	2.292		1.82		3,003	420
ENPWJSA: Mermaid Run Basin								
M-301	Valley Rd sewer, E of Interceptor	0.189	0.328	0.379	1.73	2.01	190	997
M-302	Valley Rd sewer, N of Interceptor	0.258	0.445	0.637	1.72	2.47	258	1,000
M-112	Holstein Ct sewer, W of interceptor	0.027	0.040	0.107	1.48	3.94	163	167
M-113	Jolly Rd sewer, W of interceptor	0.021	0.034	0.067	1.68	3.25	107	192
M-201	Jolly Rd sewer, E of interceptor	0.061	0.088	0.280	1.44	4.60	77	789
Subtotal	Mermaid Int, upstream of Jolly Rd	0.556	0.840		1.51		795	699
M-400	Mermaid Interceptor, below Jolly	1.103	2.184	3.112	1.98	2.82	1,126	979
M-114	Twp. Line Rd sewer @ PS	0.018	0.059	0.477	3.25	26.27	191	95
Total	Mermaid Run Pump. Sta.	1.121	2.238		2.00		1,317	851
Shelfd	Mermaid Run Pump. Sta.	0.586	0.980		1.67		1,633	359



**TABLE 5-5  
SUMMARY OF TEMPORARY FLOW METERING**

Sewer System Sub-Area		Flow (mgd)			Peak Factors		Unit Flow	
No.	Description	Average	Max. Day	Peak Inst.	Max. Day	Peak Inst.	Units (EDU)	(gpd/EDU)
<b>Ambler: Prophecy Creek Basin</b>								
op. time	Beale Road Pump. Sta. (above A-202)	0.048	0.185		3.86		182	263
A-201	Route 73E collector sewers	0.095	0.147	0.241	1.54	2.52	129	740
A-202	Route 73W collector sewers	0.163	0.274	0.375	1.68	2.30	477	342
A-203	Prophecy Int, upstream of Rte 73	<u>0.148</u>	0.216	0.470	1.46	3.18	625	237
Subtotal	Prophecy Interceptor at Route 73	0.406	0.538		1.32		1,231	330
A-101	Greystone Rd & Butler Pk sewers	<u>0.074</u>	<u>0.180</u>	0.258	2.42	3.46	173	430
Subtotal	Prophecy Int. upstream of Morris Rd.	0.481	0.718		1.49			
A100	Prophecy Interceptor Total	0.751	1.091		1.45		1,316	571
Int meter	Joint Interceptor @ Butler Pk	0.678	0.826		1.22			

## Stony Creek Interceptor Flows at PA Turnpike



## Stony Creek Interceptor Flows at Twp. Line PS

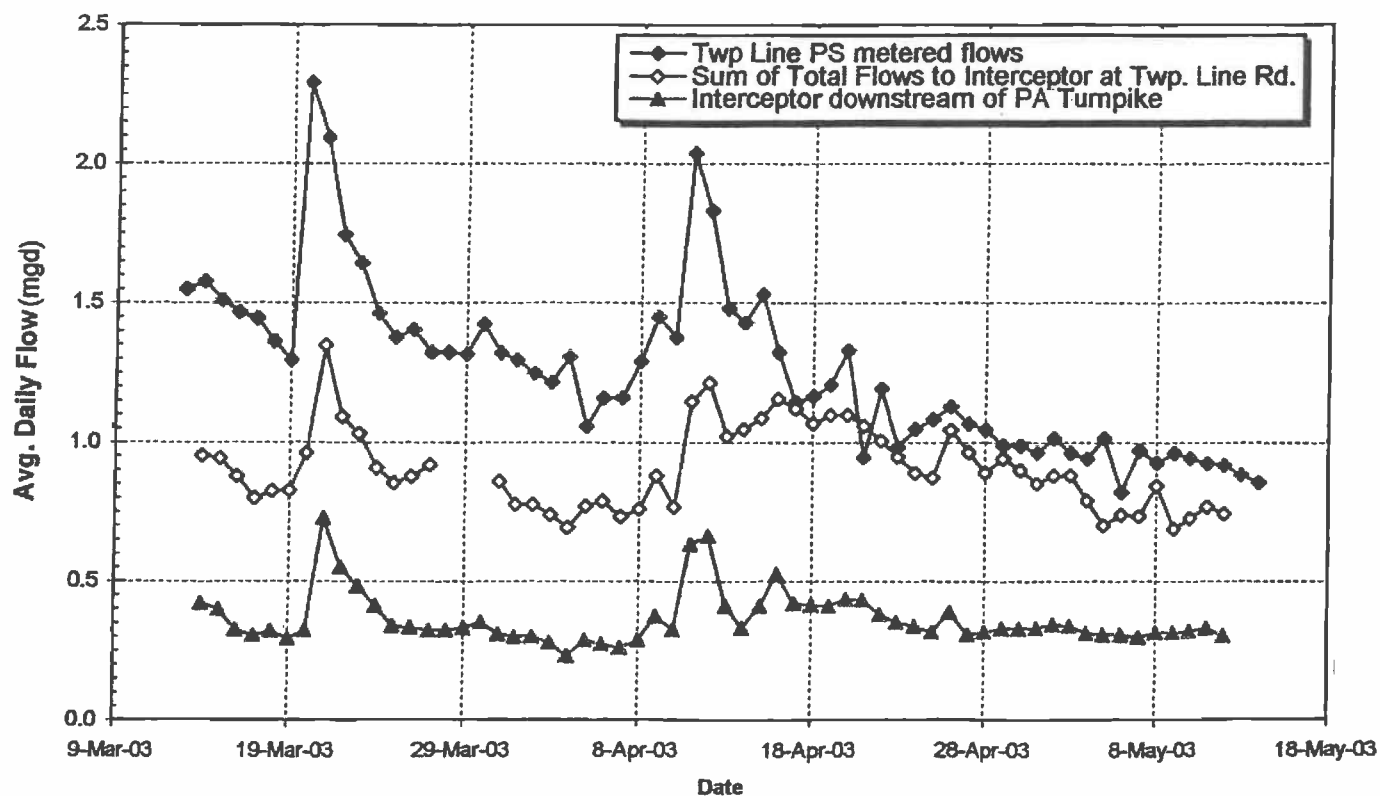


FIGURE 5-7: COMPARISON OF FLOWS IN STONY CREEK INTERCEPTOR

## Whitpain Flows in ENPWJSA System

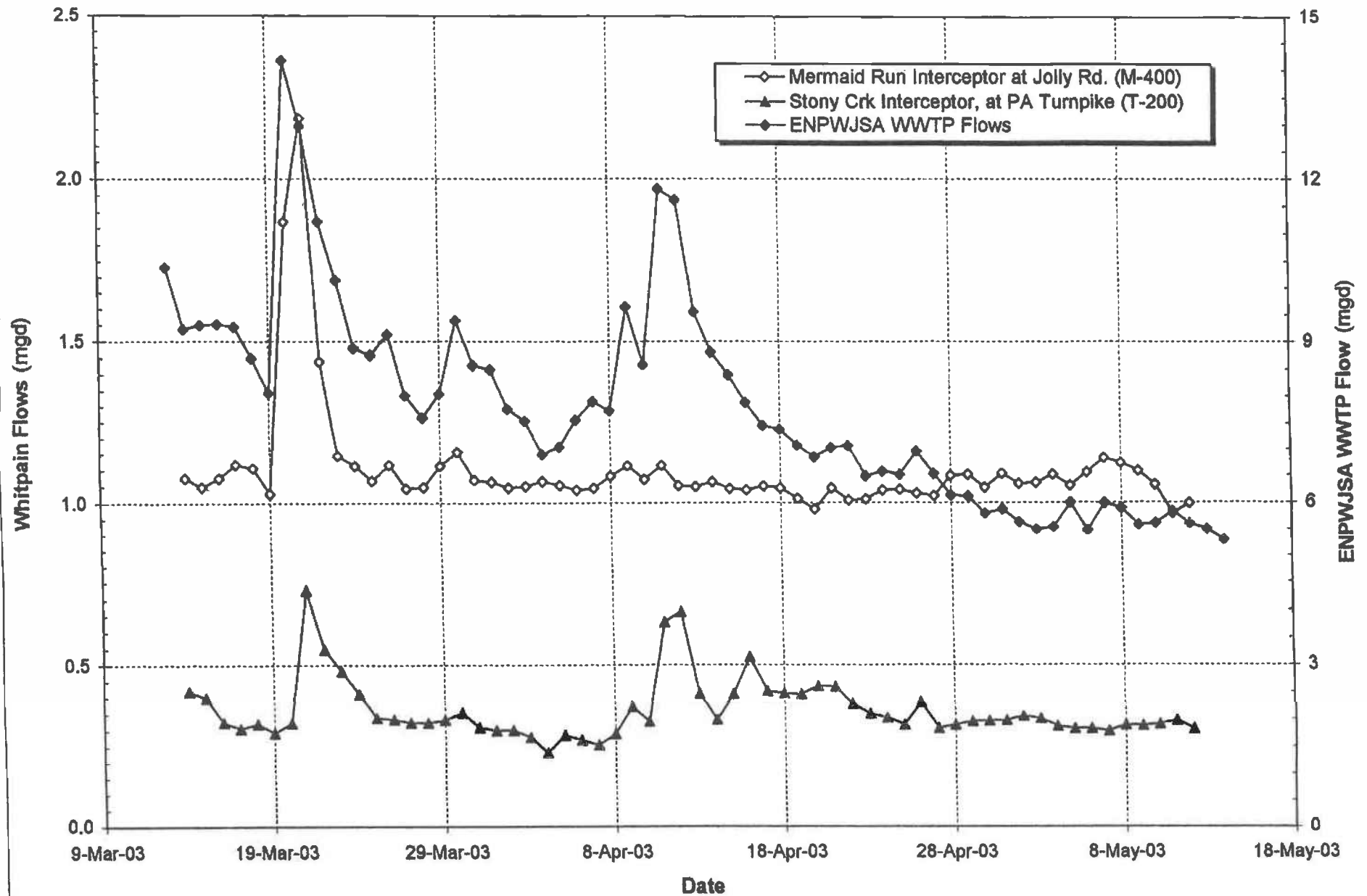
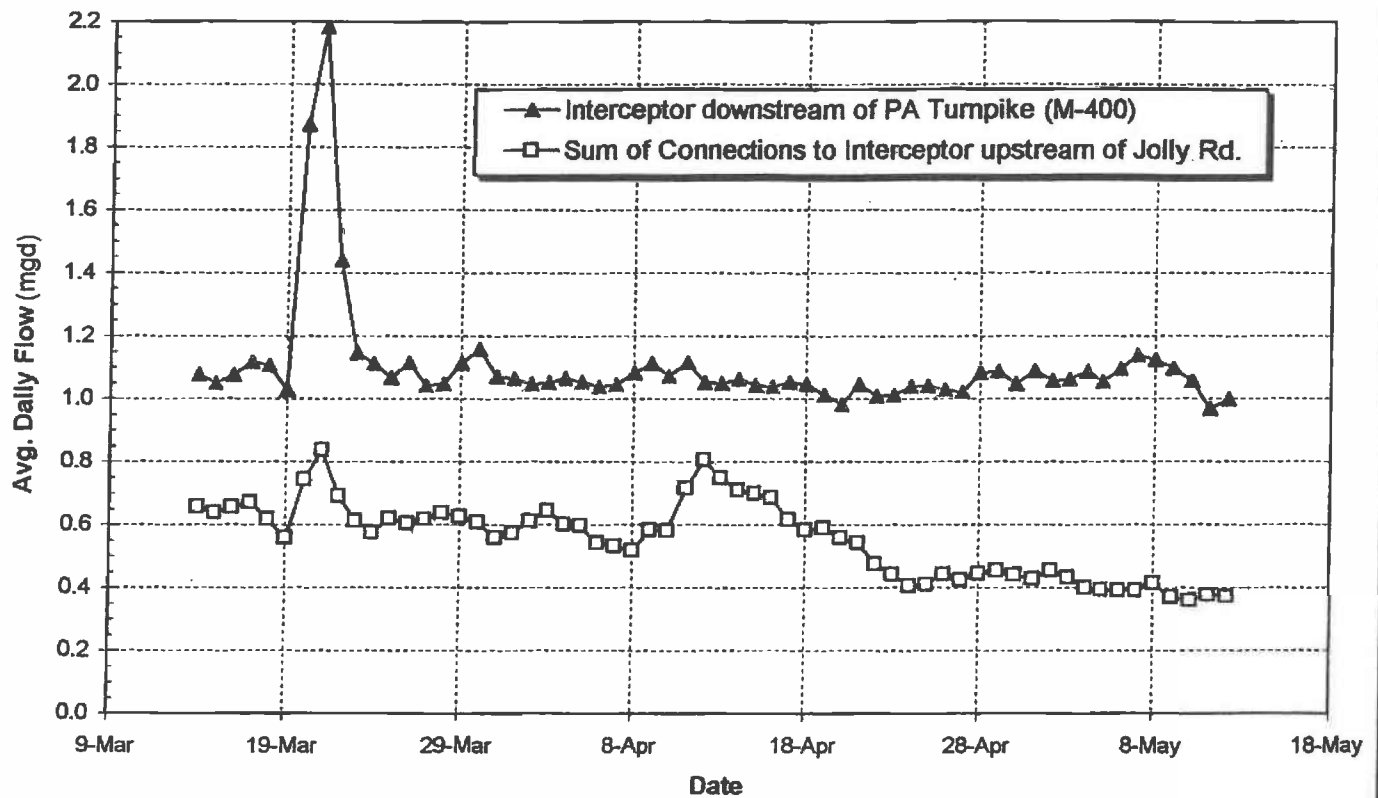


FIGURE 5-8: COMPARISON OF FLOWS IN E.N.P.W.J.S.A. SYSTEM

Mermaid Run Interceptor Flows at Jolly Road



Mermaid Run Interceptor Flows at Pumping Station

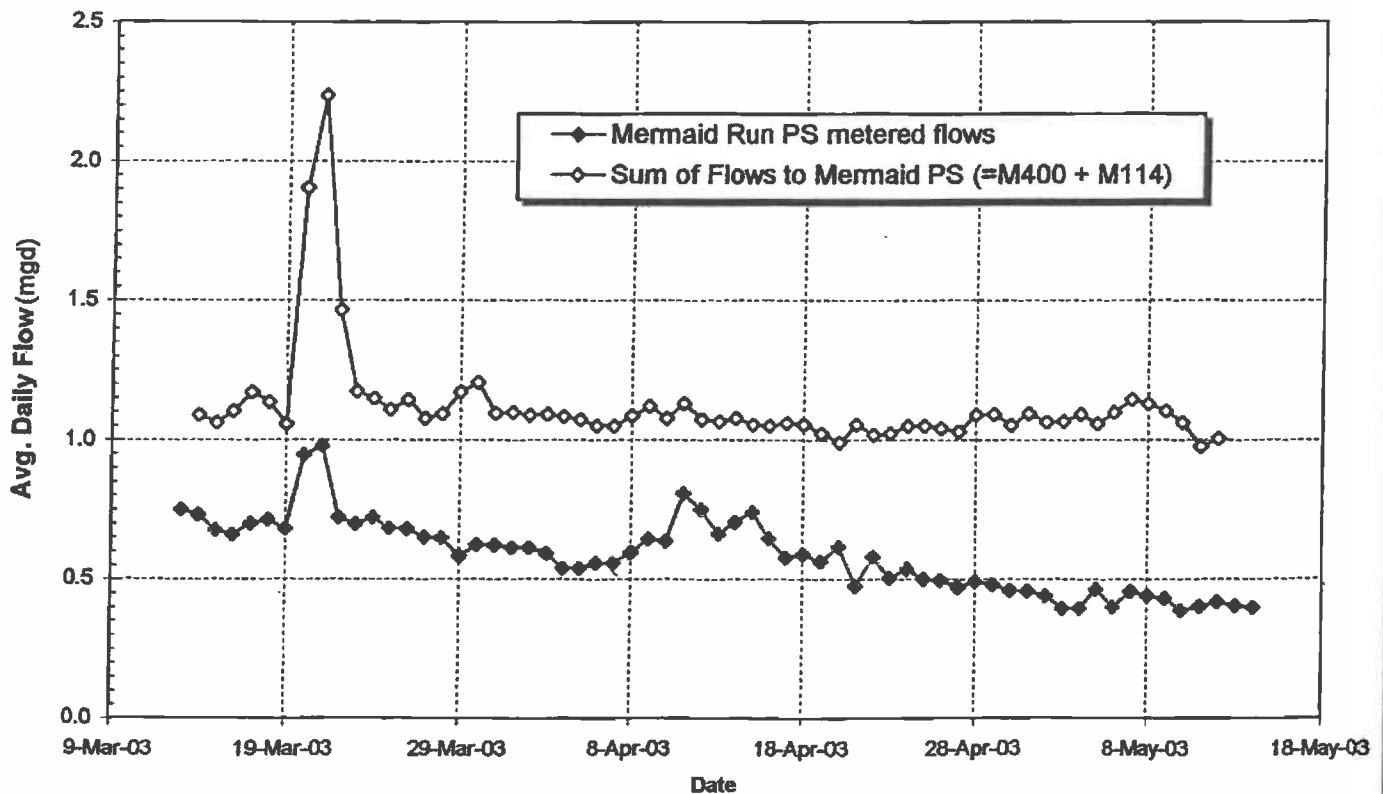
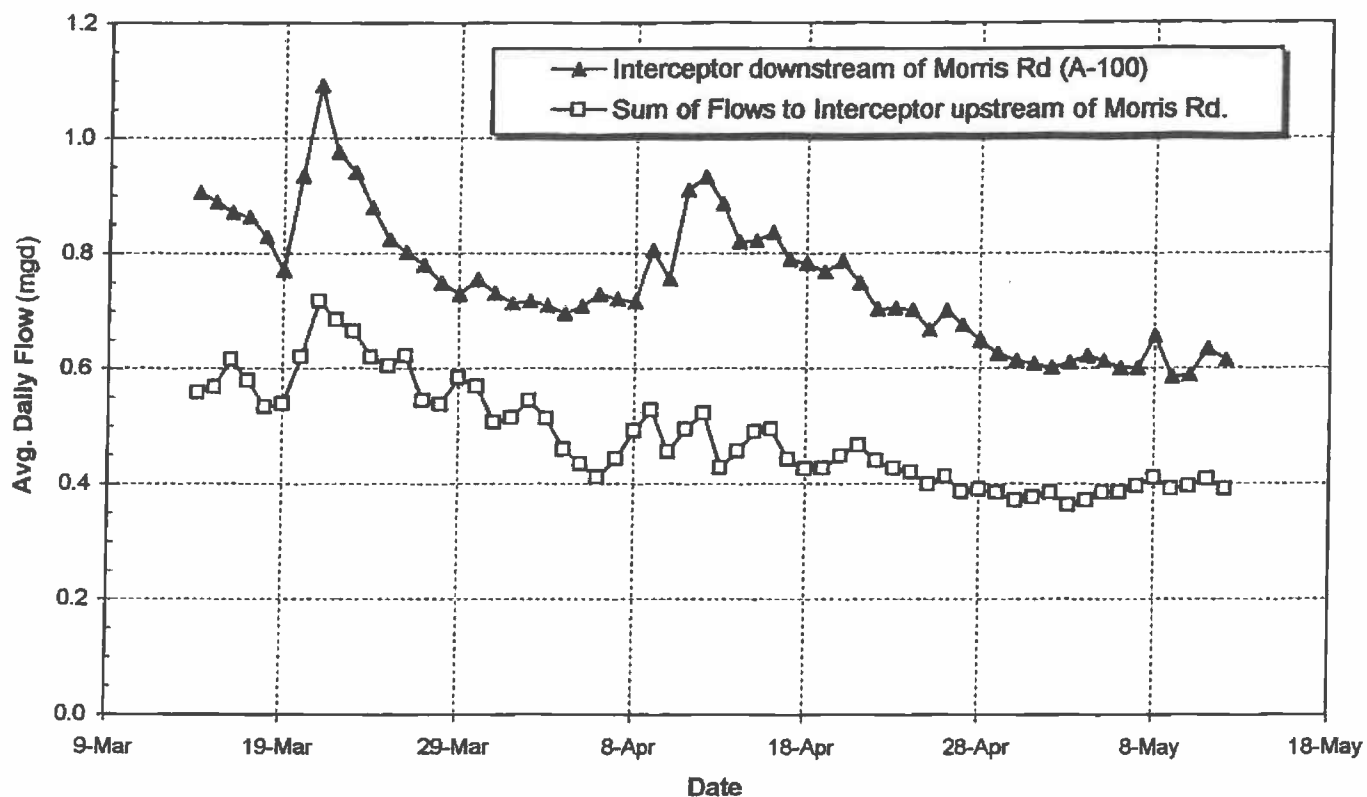


FIGURE 5-9: COMPARISON OF FLOWS IN MERMAID RUN INTERCEPTOR

## Prophecy Creek Interceptor Daily Flows



## Joint Interceptor Daily Flows

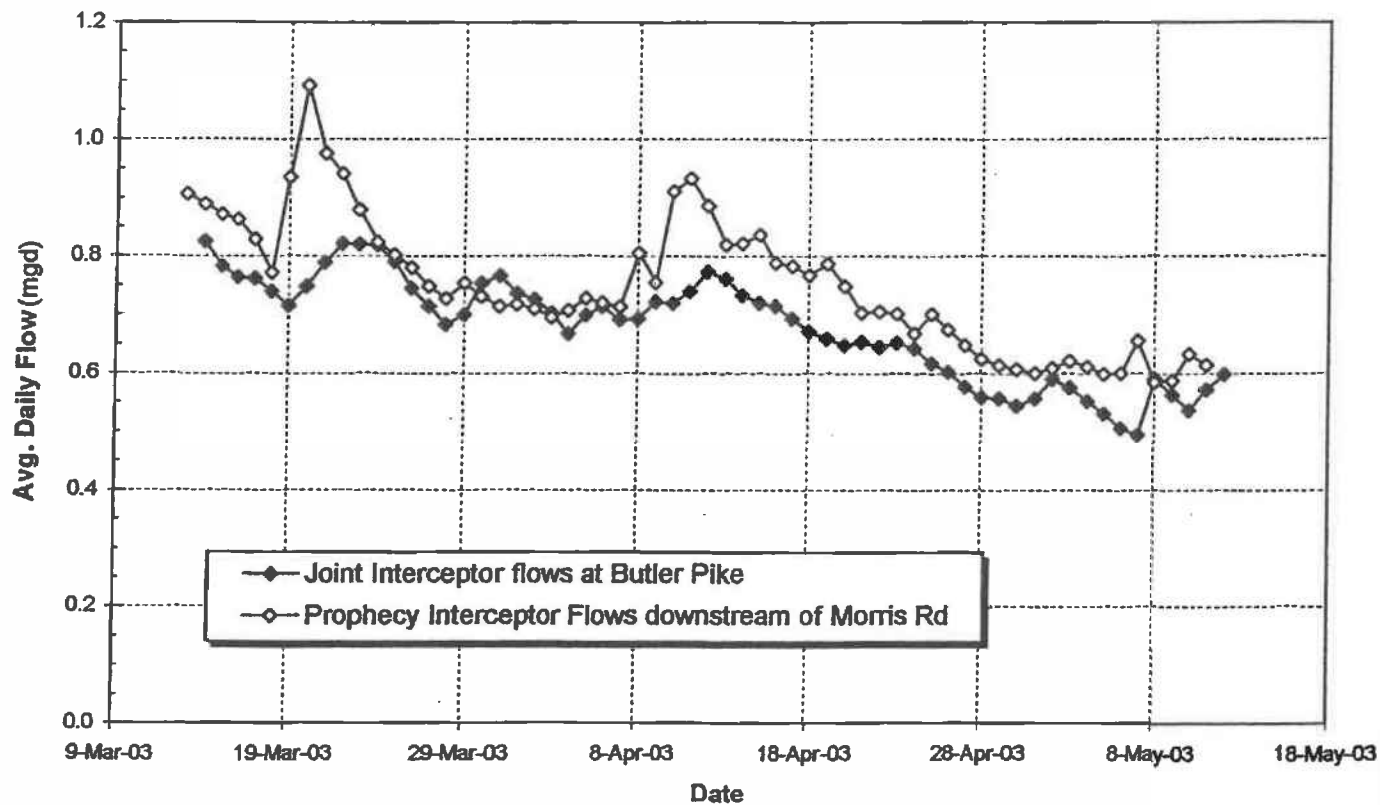


FIGURE 5-10: COMPARISON OF FLOWS IN PROPHECY CREEK INTERCEPTOR



- Open Space**
- Protected - Private
  - Protected - Public
  - Protected - WVWA
  - Protected - WVWA Easement
  - Unprotected - At Risk
  - Unprotected - Long Term
  - Wings Field
  - Public School
  - Protected Conservation Easement-Natural Lands Trust

Revision Dates  
December 27, 2000  
May 01, 2002

**DRAFT**

**WHITPAIN TOWNSHIP  
 COMPREHENSIVE PLAN  
 MONTGOMERY COUNTY, PENNSYLVANIA**

**MAP #4:  
 OPEN SPACE**



September 14, 2000

SCALE 1" = 3000'

**THE WAETZMAN PLANNING GROUP**  
 1230 County Line Road, Bryn Mawr PA 19010 - 1505  
 Telephone: (610) 527 - 0600; Fax: (610) 527 - 0445

**TABLE 5-6  
VACANT LAND ANALYSIS**

Lot No.			Property Name	Property Location	Characteristics			Develop. Potential		Comments
(1)	(2)	(3)			Size (acres)	Zoning	Status	Housing (EDU)	Flow (gpd)	
EAST NORRITON-PLYMOUTH-WHITPAIN JOINT SEWER AUTHORITY										
Drainage Basin A: Township Line PS										
Vacant Land										
1	2	Strassburger (Vill. of Normandy)	NW of Morris Rd. & Rt. 202	9.6	R-6	Dev	113	31,075	hotel, conference center, restaurant, office bldg	
		Contin. Forms Inc. (Amberley)	North Wales & Morris Rds.				119	32,725	plans submitted (apartments)	
		Anderson-Lake tracts	SE corner Morris & North Wales Rds	11.1			33	9,075	plans submitted (townhouses)	
	3	Greger (Foxcroft)	N. Wales Rd. @ Twp. park	45.0		Dev	72	19,800	sewer constructed by Oct. 2003	
	4	Pileggi (Foxcroft)	N. Wales Rd. @ Twp. park	17.4		Dev			"	
		Miller (Foxcroft II)	N. Wales Rd. @ Twp. park				24	6,600	plans submitted (townhouses)	
2			Skippack Pk, behind Ferguson property	12.0	R-6		2	550	2 flag lots, deed restricted	
3	2		Skippack Pk. @ Whitpain Hills	10.0	R-1		11	3,025	previous request zoning to med. density	
47		Donohue (Paone)	1880 Skippack Pike	10.3		319	30	8,250	plans submitted (townhouses)	
		Kowalski	Skippack Pk, E of N. Wales Rd				20	5,500		
		Gambone	1950 Skippack Pk, E of N. Wales Rd	3.4	R-1		13	3,564	plans submitted (office bldg.)	
4			N. Wales Rd. @ PA Tpk.	2.5	R-1		2	550		
5		PECO	along PA Tpk.	14.0	PR		15	4,125	landlocked	
6	8		behind Center Square Hotel	5.0	R-1		5	1,375	11 Ac. Partly floodplain/preservation	
	7		behind Fairview Rd, W of Rte. 202	6.4	R-1		7	1,925		
	6		end of Cherry Rd, W of Rte. 202	9.0	R-1		9	2,475		
7	25	Kaplan (Blue Bell Springs)	Rt. 202 & Mont. Co. College	39.0	R-9	Dev	135	37,125	to be constructed in 2005	
		MontCo Comm. College	Rt. 202, Morris & Cathcart Rds	190.5	IN	Dev	127	34,925	plans submitted (Tech. Center)	
9	11	Horse Farm	Morris Rd, bet. Cathcart & Schoolhouse	2.0	R-1		2	550		
		Harms tract (Tall Oaks)	613 Cathcart Rd.	2.6	R-1		2	550	plans submitted (2 addl. lots)	
10			Cathcart Rd. (west side)	1.8	R-1		1	275		
11		(Pines of Blue Bell)	Cathcart Rd.	3.0	R-1	Dev			4 units Constructed & occupied	
		Gardner (Better Living Homes)	670 Cathcart Rd.	3.0	R-1		2	550	plans submitted (2 addl. lots)	
21		Marsh	Skippack Pike & Wentz Road	3.2	IN	Pres		0	adjacent to Township Building	
25	9	(CVS Pharmacy)	Rte 202, just S of Rte 73	2.0	C		6	1,671	Constructed & occupied	
		Danella tract (Wawa)	1015 DeKalb Pk (Rte 202), S of Rte 73	3.2	C		23	6,380	plans submitted (food market & gas station)	
	9		Center Square, SW of Rtes. 202 & 73	5.2	C		5	1,375		
	3		Yost Rd, W of Stony Creek Elem. School	5.1	R-1		5	1,375		
26	66	4 Spacht	1901-91 Yost Rd. @ N. Wales Rd.	12.0	R-1		13	3,575		
27		Jar Jr. Inc (Creek View)	Yost Rd. @ Stony Creek	12.0	R-1	Dev			5 units Constructed & occupied	
28	71	Bruno	1623-25 Yost Rd. @ Stony Creek	8.0	R-1		8	2,200		
29			across RR from N Wales Rd.	6.0	R-2		12	3,300	Partly wooded	
30			off Lafayette Way	1.5	R-2		3	825	Flag lot	
31			Rt. 202, W of Center Square	1.0	C		1	275		
32			Pheasant Meadow Rd. & Gwynedd Rd.	1.0	R-1		1	275		
Subtotal: Vacant Land				457.8			821	225,840		

**TABLE 5-6  
VACANT LAND ANALYSIS**

Lot No.			Characteristics			Develop. Potential		Comments	
(1)	(2)	(3)	Size	Zoning	Status	Housing	Flow		
Property Name			(acres)			(EDU)	(gpd)		
EAST NORRITON-PLYMOUTH-WHITPAIN JOINT SEWER AUTHORITY (contd.)									
Temporarily Protected Open Space									
44	1	Ferguson	1895 Skippack Pk. @ PECO ROW	9.9	R-6	319	22	6,050	Part floodplain
45	67	4 Spacht	1819 Yost Rd. @ Stony Creek School	14.0	R-1	319	15	4,125	
46		Whitpain Green SC	Township Line Rd. & Erbs Mill Rd.	2.8	PR		3	825	
48	70	5 Sesame Day Camp	Yost Road	21.7			23	6,325	
49	29	Beachcomber SC	DeKalb Pike, N of Route 73	18.2	R-1		20	5,500	
50	77	10 Leoni	1002 DeKalb Pike @ Center Square	11.5	R-1	319	100	27,500	Center Square land use plan
51	11	Horse Farm	Morris Rd, bet. Cathcart & Schoolhouse	7.4	R-1		8	2,200	
Subtotal: Temporarily Protected Open Space				85.5			191	52,525	
Basin A (Township Line PS) Totals				543.3			1,012	278,365	
Drainage Basin B: Mermaid Run PS									
Vacant Land									
19		Blue Bell Inn Office Complex	Bluebell Pk. @ Bluebell Inn	6.0	C		6	1,650	Plans filed. Under construction
43			Skippack Pk. & School House Ln.	1.3	R-1		1	275	
			860 Penilyn Pk, N of Rte 73	2.1	C		13	3,465	
			599 Skippack Pk, N of Penilyn Pk	0.9	C		2	594	
		(Kendrick Hill)	NW corner Swede St & Rte 202	1.1	C-1		11	2,929	
Subtotal: Vacant Land				11.3			32	8,913	
Temporarily Protected Open Space									
52	87	36 Mermaid Lake S.C.	S side of Jolly Rd bet. Wentz Rd & Arch S	62.0	PR		68	18,700	Part floodplain
53		37	Arch St. & Jolly Road	12.0	R-1		13	3,575	
55	28	Meadowlands C.C.	Plymouth Rd, bet. Morris & Boehms Rds	93.8	PR		103	28,325	
56	28	Meadowlands C.C.	Plymouth Rd, bet. Morris & Boehms Rds	35.4	PR		38	10,450	
57		35 Blue Bell Sr. Camp	Union Meeting & Hoover Roads	40.5	R-1		44	12,100	
Subtotal: Temporarily Protected Open Space				243.7			266	73,150	
Basin B (Mermaid Run PS) Totals				255.0			298	82,063	



**TABLE 5-6  
VACANT LAND ANALYSIS**

Lot No.			Property Name	Property Location	Characteristics		Develop. Potential		Comments	
(1)	(2)	(3)			Size (acres)	Zoning	Status	Housing (EDU)		Flow (gpd)
EAST NORRITON-PLYMOUTH-WHITPAIN JOINT SEWER AUTHORITY (contd.)										
Drainage Basin C: Sheffield Drive Meter - Gravity section										
Vacant Land										
	34		UniSys	SE of Jolly & Union Mtg. Rds.	110.8	RE	Dev	570	156,750	plans submitted (corporate center)
Drainage Basin D: Walton Road Meter										
Vacant Land										
22	122		Wolf (Oakhurst)	548 Stenton Ave, W of Walton Rd.	47.5	R-5	Dev			26 units Constructed & occupied
	33			NW corner of Twp. Line Rd & Penilyn Pk.	10.8	R-1		11	3,025	
39				Chatham Ln., off Bluebell Pk.	2.3	R-1		2	550	
69			Penn Liberty Bank	Norristown & Narcissa Rds	14.0	I		2	550	
Subtotal: Vacant Land					74.6			15	4,125	
Temporarily Protected Open Space										
67				Sentry Pkwy.	10.0	AR		11	3,025	Landlocked plans submitted (addn. of bank to exist. offices)
68				Norristown Rd. & Sentry Pkwy.	1.9	I		1	275	
Subtotal: Temporarily Protected Open Space					11.9			12	3,300	
Basin D (Walton Road Meter) Totals					86.5			27	7,425	
Drainage Basin E: Sparango PS										
Vacant Land										
40				Stenton Rd. & Norristown Rd.	4.0	R-5		2	550	2 lots
41				Stenton Rd., SE of Norristown Rd.	5.0	R-5		2	550	2 lots. Partly wooded
Basin E (Sparango PS) Totals					9.0			4	1,100	
E.N.P.W.J.S.A. TOTALS					1,005			1,912	525,702	

**TABLE 5-6  
VACANT LAND ANALYSIS**

Lot No.				Property	Characteristics			Develop. Potential		Comments
(1)	(2)	(3)	Name	Property Location	Size (acres)	Zoning	Status	Housing (EDU)	Flow (gpd)	
AMBLER JOINTURE										
Drainage Basin 1: Prophecy Creek Interceptor										
Vacant Land										
15			Marial Corp.	Mathers Mill Rd. & Township Line Road N	16.9	Ind		9	2,475	located on N side of Wissahickon Creek
16	40		Cheston	340-374 Morris Road @ Mathers Mill Rd.	5.9	R-5		3	825	wooded; surrounded by WVWA lands
17	42	18	F. Otto Haas	between Lewis Lane and Prophecy Creek	51.8	R-5		28	7,700	partly wooded
18		18	Haas	between Lewis Lane and Prophecy Creek	33.6	R-5		18	4,950	heavily wooded
		18	Haas	SE corner of Lewis Ln. & Morris Rd.	10.0	R-5		5	1,375	
		19		Morris Rd, bet. Mt Pleasant & Betsy	9.2	R-5		5	1,375	
		20		Lewis Ln, N of Dawesfield	21.1	R-5		11	3,025	
20				Skippack Pk. & Narcissa Rd.	6.2	R-5		3	825	across from Shady Grove school
23				W side of Narcissa Road, N of Wings Field	8.0	R-5		4	1,100	across from Blue Bell Woods
24	117		Schoenberg (Devonshires)	Butler Pike, N of Stenton Ave.	22.0	R-5	Dev			9 units Constructed & occupied
24		32		Butler Pike, S of Devonshires	3.0	R-5		1	275	
		27	various	Penllyn Pk, bet. High Gate & Williamsburg	51.9	R-5		28	7,700	
		28		Walton Rd, N of Stenton Ave.	10.9	R-5		5	1,375	
		16		SW corner of Morris Rd & Lewis Ln	3.9	R-5		2	550	
		24			1.8	R-5		1	275	
37		25	MacKenzie	Skippack Pk. & Walton Rd.	15.9	R-5		8	2,200	
		26		Lewis Ln flag lot, NW of Rte 73	10.5	R-5		5	1,375	
38			Kunkin (Walmere)	E side of Walton Rd., N of Stenton Ave	16.9	R-5	Dev	9		Constructed, occupied
Subtotal: Vacant Land					299.5			145	37,400	
Temporarily Protected Open Space										
59	23		Nutt	475 Skippack Pike (flag lot)	21.9	R-5	319	11	3,025	adjacent to Armentrout
60	49	22	Stratton	535 Skippack Pike	22.5	R-1	319	24	6,600	adjacent to Nutt
61		29	Wistar	527 Stenton Ave.	10.6	R-5	319	5	1,375	adjacent to Wolf
62		21	Dawesfield	599 Lewis Lane	23.4	R-5		12	3,300	
63		17		Lewis Lane	9.2	R-5		4	1,100	across from Dawesfield
66	107		Wings Airfield	Walton Rd, Narcissa Rd. & Stenton Ave.	173.3	R-5		94	25,850	
70	54		Thomson	299 Skippack Pk. near Narcissa Rd.	80.9	R-5	319	44	12,100	
71	116	30	Cadwalader	120 Norristown Rd.	19.8	R-5	319	10	2,750	
72	121	31	Oak Lane Day School	Stenton Ave @ Butler Pike	28.0	IN		15	4,125	
Subtotal: Temporarily Protected Open Space					389.6			219	60,225	
Basin 1 (Prophecy Creek Interceptor) Totals					689.1			364	97,625	

**TABLE 5-6  
VACANT LAND ANALYSIS**

Lot No. (1) (2) (3)			Property Name	Property Location	Characteristics		Develop. Potential		Comments
					Size (acres)	Zoning Status	Housing (EDU)	Flow (gpd)	
AMBLER JOINTURE (cont'd.) Drainage Basin 2: Willow Run Creek									
Vacant Land									
14	35	13	Walbridge	NE of Morris Rd. & Penlyn Pike	64.2	R-5	34	9,350	adjacent to Cedarbrook C. C. 5 lots 1.5 Ac. ea. partly wooded
35				Plymouth Rd. @ Meadowbrook CC	7.5	R-1	8	2,200	
36				Bluebell Pk., E of Skippack Pk.	1.5	C	1	275	
Subtotal: Vacant Land					73.2		43	11,825	
Temporarily Protected Open Space									
58	38	15	Armentrout	548 Morris Rd. E of Penlyn Pike & Beale P	78.8	R-5 Pres			
74	32		Cedarbrook C. C.	Penlyn Bluebell Pk. @ Wissahickon Creek	188.5	PR	207	56,925	
Subtotal: Temporarily Protected Open Space					267.3		207	56,925	
Basin 2 (Willow Run Creek) Totals					340.5		250	68,750	
Drainage Basin 3: LGTMA Interceptor Sewer									
Vacant Land									
8	14		Harris Estate	Morris, Plymouth, Cathcart & Twp. Line Rd	60.0	R-5	32	8,800	4 parcels adjacent to Natural LandsTrust 4 scattered lots approx. 2 Ac. ea. predominantly wooded
12				between Morris Rd. & Township Line Road	8.0	R-5	4	1,100	
13	12		Ayerle	Penlyn Pike, bet. Morris Rd. & Lantern Ln.	16.1	R-5	8	2,200	
	12			Penlyn Pike, bet. Morris Rd. & Lantern Ln.	8.0	R-5	4	1,100	
	14			Mathers Mill Rd, N of Morris Rd.	10.4	R-5	5	1,375	
33				Plymouth Rd. & Lantern La.	4.0	R-5	2	550	partly wooded flag lot
34				Morris Rd. @ Ayerle property	2.5	R-5	1	275	
9				Morris Rd. @ Horse Farm	2.0	R-1	2	550	
Subtotal: Vacant Land					111.0		58	15,950	
Temporarily Protected Open Space									
54	12		Ayerle	235 Penlyn-Bluebell Pk.	22.4	R-5 319	12	3,300	
Subtotal: Temporarily Protected Open Space					22.4		12	3,300	
Basin 3 (LGTMA Interceptor Sewer) Totals					133.4		70	19,250	
AMBLER JOINTURE TOTAL					1,163		684	185,625	

**TABLE 5-6  
VACANT LAND ANALYSIS**

Lot No.			Property			Property Location			Characteristics			Develop. Potential		Comments	
(1)	(2)	(3)	Name					Size	Zoning	Status	Housing	Flow			
									(acres)			(EDU)	(gpd)		
<b>WHITEMARSH TWP.</b>															
42			Vacant Land		Township Line S. & Pemberton Rd.		1.5		R-5		0		0		
			<b>Whitemarsh Twp. Total</b>				<b>1.5</b>				<b>0</b>		<b>0</b>		
<b>UPPER GWYNEDD TWP.</b>															
1 2			Strassburger (Windermere)		NW of Morris Rd. & Rt. 202		52.0		R-6 Dev.		0		0		77 units Constructed & occupied
			<b>Upper Gwynedd Twp. Total</b>				<b>52.0</b>				<b>0</b>		<b>0</b>		
<b>WHITPAIN TOWNSHIP TOTALS</b>															
			<b>Overall System</b>				<b>2,221</b>				<b>2,596</b>		<b>711,327</b>		
			Vacant Land				<b>1,090</b>				<b>1,119</b>		<b>305,162</b>		
			Temporarily Protected Open Space				<b>1,020</b>				<b>907</b>		<b>249,425</b>		

**Notes:**

- (1) Properties 1 - 24 are described in Chapter 5 of the *Whitpain Township Open Space Plan*, Nov. 1995
- (1) Properties 25 - 43 are shown as vacant land on Map 2 of the *Whitpain Township Open Space Plan*, Nov. 1995
- (1) Properties 44 - 74 are listed in Chapter 2 or shown as temporary open space on Map 2 of the *Whitpain Township Open Space Plan*, Nov. 1995
- (2) Properties Numbers are as used previously in the *Whitpain Township Vacant Land Study*, 1977
- (3) Properties Numbers are as used in the *Whitpain Township Comprehensive Plan*, Sept. 2002 (Draft)
- (4) Housing yield for each zoning district are based on the following:

Zoning District		Density (EDU/Ac)
R-1	Residential	1.1
R-2	Residential	2.1
R-5	Cluster development	0.54
R-6	Retirement housing	2.27
R-9	Mobile Home Park	4
PR	Park and Recreation	1.1
IN	Institutional	0.55
RE	Research & Engineering	

- (5) Flows are estimated at 275 gpd/EDU
- (6) Flows are not included for properties that were connected as of 2002.

**TABLE 5-7  
DETERMINATION OF WASTEWATER TREATMENT NEEDS**

Service Area	Current Sewer Connections		Exist. Houses w/OLDS (EDU)	Future Additions				Future Needs	
	(EDU)	Avg. Flow (mgd)		Potential Housing (EDU)		Projections		(EDU)	Avg. Flow (mgd)
				Vacant	Temp. Open	Connections (EDU)	Avg. Flow (mgd)		
East Norriton-Plymouth-Whitpain Joint Sewer Authority									
A Township Line PS	3,876	1.021	102	821	191	917	0.252	4,895	1.301
B Mermaid Run PS	1,826	0.534	10	32	266	165	0.045	2,001	0.582
C Sheffield Road Meter	370	0.108	0	570	0	570	0.157	940	0.265
D Walton Road Meter	528	0.201	22	15	12	21	0.006	571	0.213
E Sparango PS	35	0.010	1	4	0	4	0.001	40	0.012
Totals	6,634	1.874	135	1,443	469	1,677	0.461	8,446	2.372
Max. 3-Month Flow:									
(a) Avg.: last 5 years		2.371							2.994
(b) 90th Percentile		2.877							3.500
Ambler Jointure									
1 Prophecy Creek Interceptor	1,519	0.456	59	145	219	255	0.070	1,833	0.542
2 Willow Run Basin	130	0.039	47	43	207	147	0.040	324	0.092
3 LGTMA Interceptor Sewer	21	0.006	50	58	12	64	0.018	135	0.038
Totals	1,670	0.501	156	246	438	466	0.128	2,292	0.672
Township Totals	8,304	2.375	291	1,689	907	2,143	0.589	10,738	3.044

**Notes:**

- 1 Current data are based on 2005, including (a) Sewer Connection data from Whitpain Township and (b) metered Avg. Flows from ENPWJSA.
- 2 Current Max. 3-Month Flow is based on both (a) the average for 2001-2005 and (b) the 90th percentile of data for the past 14 years (1992-2005).
- 3 Potential Housing is based on analysis of Vacant and Temporarily Open lands in the Township.
- 4 Projections assume that all of Vacant lands and 50% of Temporarily Open lands will be developed to limits of current zoning.
- 5 Projections also assume that all of houses with on-lot disposal systems (OLDS) will connect to sewers.
- 6 Future Flows are based on 275 gpd/EDU on average.
- 7 Future Max. 3-Month Flow assumes that incremental flows will have a peaking factor of 1.25 times the average flow.
- 8 Current Ambler Flows are estimated at 300 gpd/EDU on average.

## 6.0 IDENTIFICATION AND EVALUATION OF ALTERNATIVES

### 6.1 CAPACITY ANALYSIS OF EXISTING SEWERAGE FACILITIES

The existing sewerage facilities that serve Whitpain Township were analyzed to determine whether the available capacities are adequate to meet both current and projected future needs. Current and future flows in the Whitpain Township sewerage system are assessed in Chapter 5.

#### 6.1.1 WWTP Allocations

The following modifications to the wastewater treatment plant (WWTP) allocations will be necessary to meet the projected needs of Whitpain Township as it becomes fully developed:

Treatment Plant	Whitpain Flow (mgd)		
	WWTP Allocation	Needs	
		Current	Projected
ENPWJSA: Avg. Annual	2.70	1.87	2.37
Max. 3-Month	3.10	2.88	3.50
Ambler Jointure	0.70	0.50	0.67

As indicated, Whitpain Township will need to increase its allocated capacity in the East Norriton-Plymouth-Whitpain Joint Sewer Authority (ENPWJSA) plant if/when the Township reaches projected build-out. As shown previously, the reserved capacity in the plant will need to be increased assuming development of a portion of the temporarily protected open space.

#### 6.1.2 Pumping Stations

Past and current flows to the two major pumping stations in the Whitpain Township sewerage system are presented in Figure 6-1. Current and projected future flows are compared to existing capacities as follows:

Pumping Station	Design Capacity	Flows	
		Current	Projected
Township Line PS: Avg. Annual (mgd) Est. Peak (gpm)	1.46 3,750	1.04 2,900	1.30 3,600
Mermaid Run PS: Avg. Annual (mgd) Est. Peak (gpm)	1.30 2,800	0.53 1,600	0.58 1,700

The data in the preceding tabulation indicates that the existing capacities of the Township Line and Mermaid Run pumping stations should be adequate to meet the projected future needs of the respective service areas. There is, therefore, no need to provide additional capacity at these two major pumping stations.

Growth and flows to the other minor pumping stations, both in the ENPWJSA and Ambler districts of Whitpain Township sewerage system, are not projected to increase in the future. Current flows to the North Wales Road pumping station in the ENPWJSA district and the Beale Road and Butler Pike stations in the Ambler district are presented graphically in Figures 6-2 and 6-3, respectively. A comparison of current flows to the minor pumping stations is presented as follows:

<b>Pumping Station</b>	<b>Design Capacity</b>	<b>Current Flows</b>
<b>ENPWJSA Service Area:</b>		
North Wales Rd PS: Avg. Annual (mgd)	0.222	0.101
Est. Peak (gpm)	615	265
<b>Ambler Service Area:</b>		
Beale Road PS: Avg. Annual (mgd)	0.049	0.030
Est. Peak (gpm)	200	85
Butler Pike PS: Avg. Annual (mgd)	0.016	0.005
Est. Peak (gpm)	54	16

These three minor pumping stations have sufficient capacity to handle current flows. No significant growth in the service areas of these stations is projected. Accordingly, there is no need to consider improvements to these three pumping stations.

### 6.1.3 Conveyance Sewer System

There are four primary interceptor sewers that convey wastewater within Whitpain Township, as described in Chapter 4. Interceptor sewers exist along the Stony Creek and Mermaid Run in the ENPWJSA service area. There is also an interceptor sewer along the Prophecy Creek in the Ambler service area and Whitpain maintains the joint Wissahickon Creek interceptor sewer.

These interceptors were analyzed for capacity. The current peak flows used in the analyses are based on the comprehensive flow monitoring performed in March and April 2003. As mentioned in section 5.1.2, the temporary flow metering period coincided with the highest monthly flow ever recorded at the ENPWJSA treatment plant. Therefore, the analysis is expected to be fairly conservative. The future flows are based on the projections in Chapter 5. The analyses are summarized in the following tabulation and confirm that adequate capacity exists in the interceptor sewers.

Interceptor/Location	Length (feet)	Pipe Diam.	Limiting Capacity (mgd)	Peak Flows (mgd)	
				Current	Projected
ENPWJSA Service Area:					
Stony Creek Interceptor					
upper (E of PA Turnpike)	4,575	12"-15"	2.0	1.38	1.61
lower (W of PA Turnpike)	7,350	18"-24"	5.0	3.88	4.52
Mermaid Run Interceptor					
upper (E of Jolly Road)	9,275	15"-18"	2.5	1.39	1.56
lower (W of Jolly Road)	3,710	18"	3.5	2.23	2.45
Ambler Service Area:					
Prophecy Creek Interceptor	5,925	18"	3.8	1.87	2.16

The preceding analysis indicates that the existing sanitary sewerage infrastructure in Whitpain Township is sufficiently established to meet projected future needs.

## 6.2 IDENTIFICATION OF FACILITY REQUIREMENTS

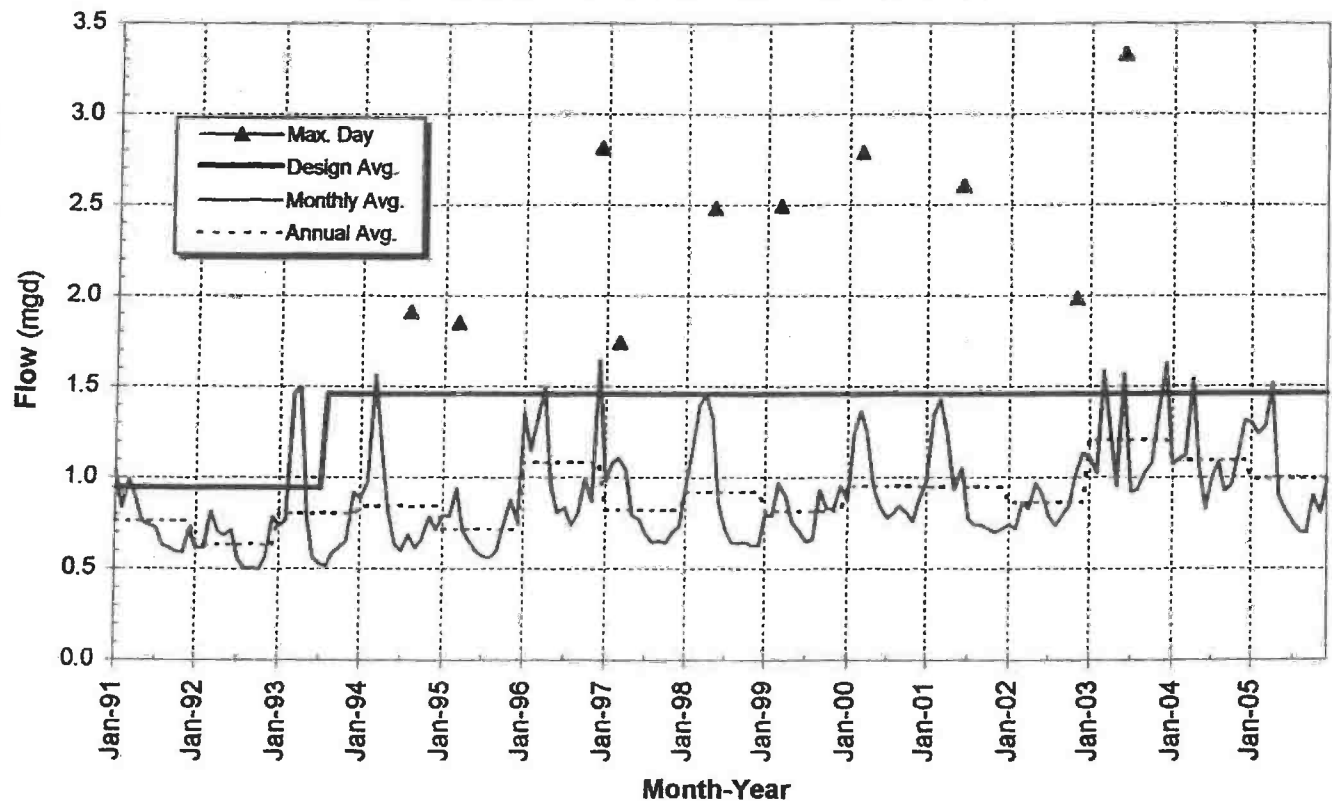
The capacity analysis in the preceding section indicates that the sewerage facilities owned and operated by Whitpain Township are adequately sized to handle not only current flows, but also projected future needs of the Township. The interceptor sewers and pumping stations have adequate capacity to convey peak flow rates. The upgrading of the Township Line and Mermaid Run pumping stations in the 1990's was sufficiently sized to meet the ultimate needs of the Township.

Conversely, Whitpain's allocated capacity in the ENPWJSA treatment plant is not adequate to meet projected future needs. However, there is no viable alternative than to increase the capacity in the ENPWJSA plant, because the Whitpain sewerage system is designed to deliver flows to that plant.

The only potential facility requirement in the Whitpain sewerage system is an interceptor sewer along the Willow Run stream in the Ambler service area. If or when vacant land and/or temporarily protected open space are developed in this basin, it may become necessary to construct an interceptor sewer. The Willow Run interceptor was preliminarily designed in 1990 and would eliminate the need for the Beale Road pumping station. However, the Willow Run interceptor is not envisioned by Whitpain Township in the next ten years.



## FLOWS TO TOWNSHIP LINE PUMPING STATION



## FLOWS TO MERMAID RUN P.S. (SHEFFIELD METER)

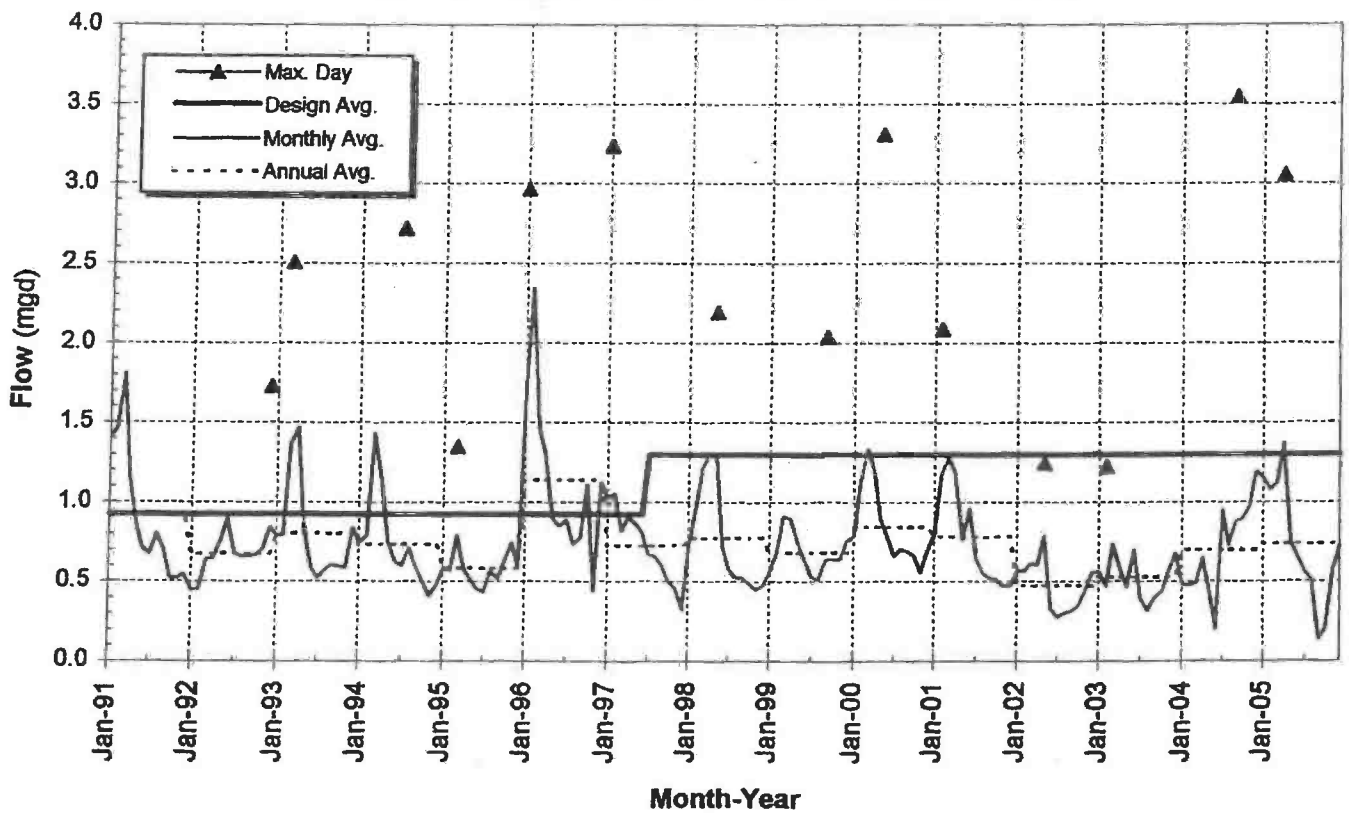


FIGURE 6-1: FLOWS TO TOWNSHIP LINE AND MERMAID RUN P.S.

## FLOWS TO NORTH WALES ROAD P.S.

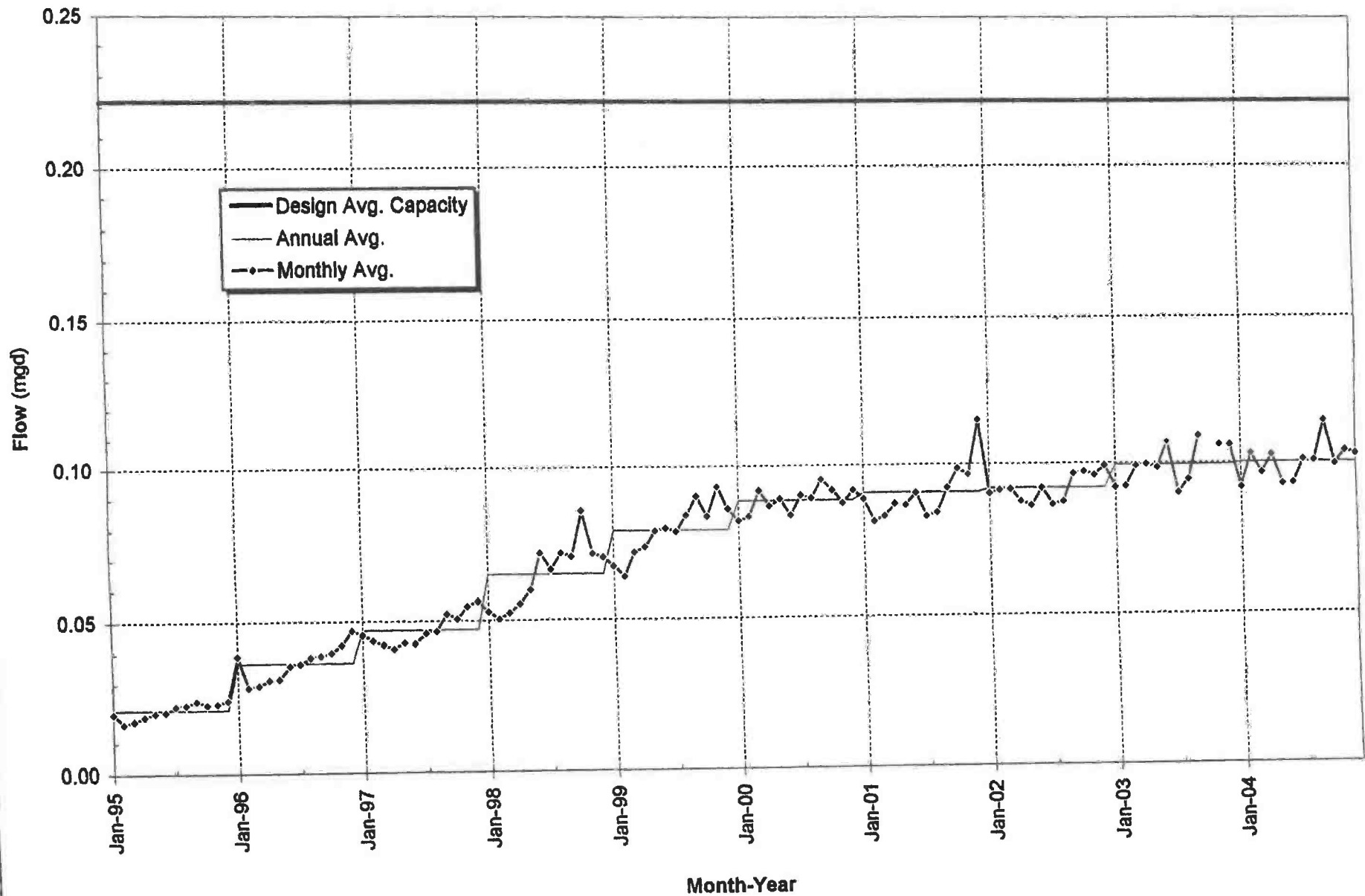


FIGURE 6-2: FLOWS TO NORTH WALES ROAD P.S.

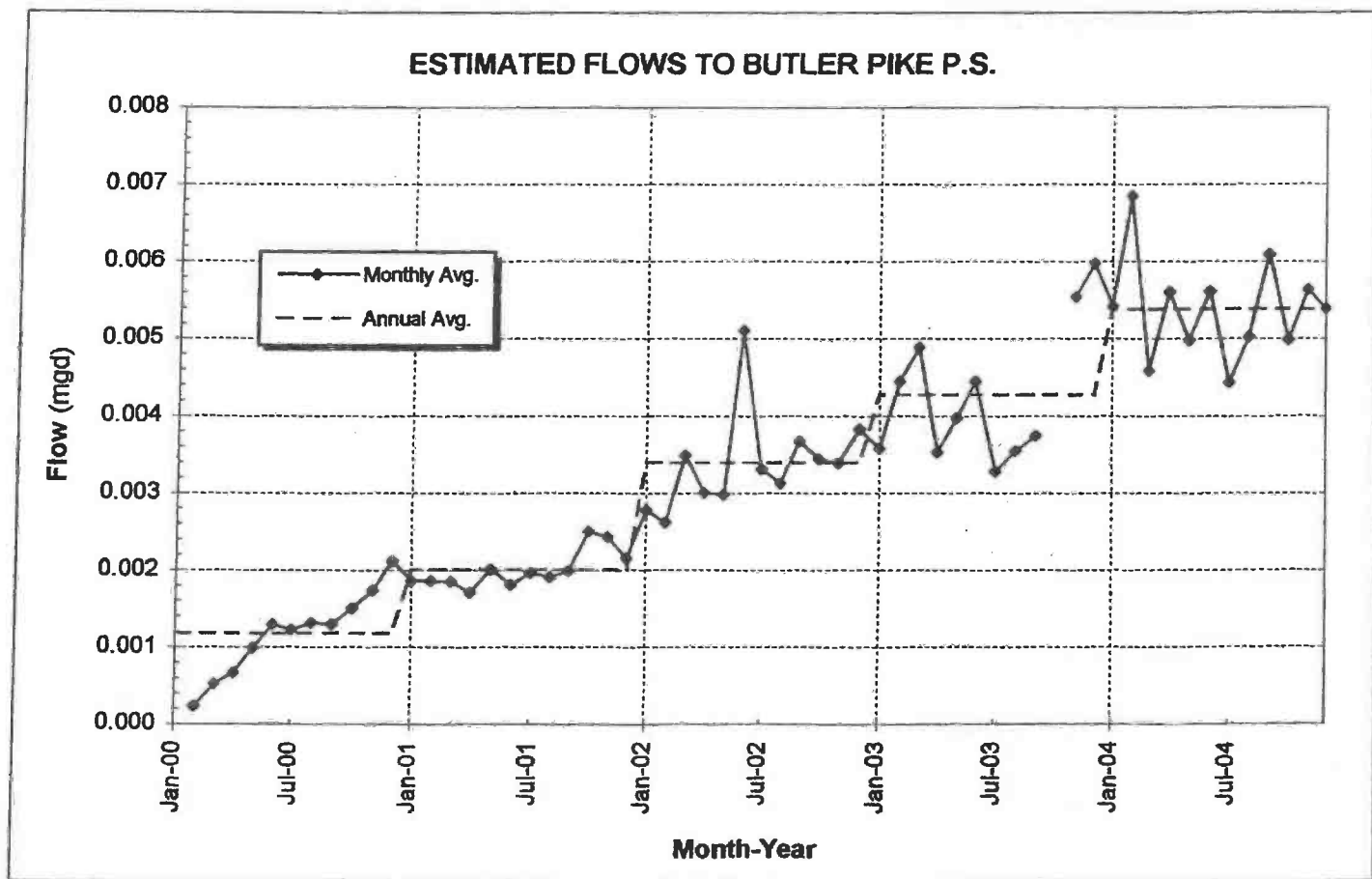
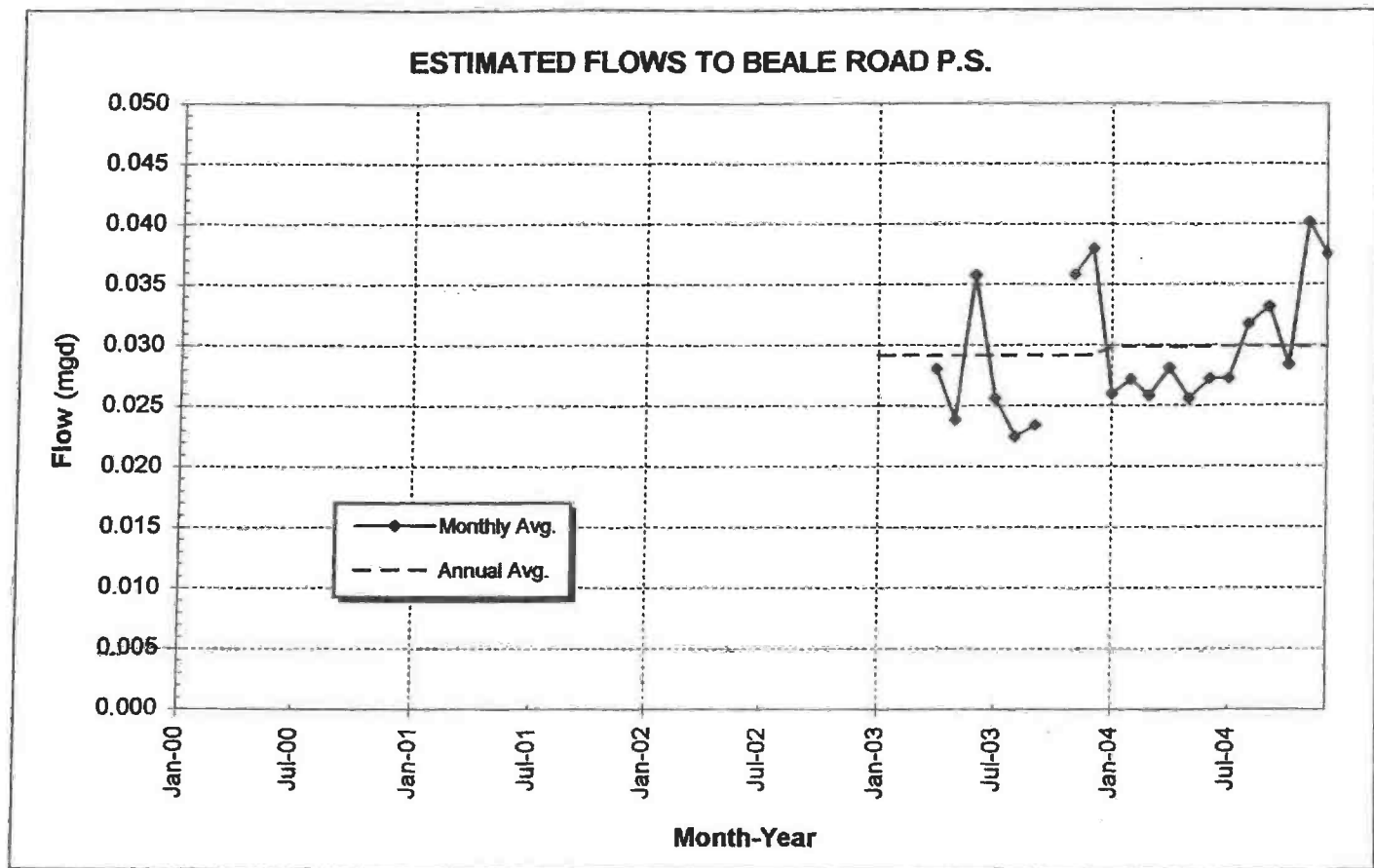


FIGURE 6-3: FLOWS TO BEALE ROAD AND BUTLER PIKE P.S.

## 7.0 DESCRIPTION OF SELECTED PLAN

### 7.1 PLAN SUMMARY

The plan selected by Whitpain Township calls for:

- **Acquisition of additional treatment capacity to meet future needs.** The following modifications to the allocations in the East Norriton-Plymouth-Whitpain Joint Sewer Authority (ENPWJSA) plant will be necessary as sewer service is extended to meet the near-future and long-term future needs in Whitpain Township:

Treatment Plant	Whitpain Flow (mgd)		
	WWTP Allocation	Needs	
		Current	Projected
ENPWJSA: Avg. Annual	2.70	1.87	2.37
Max. 3-Month	3.10	2.37	3.50

The preceding acquisition of capacity in the ENPWJSA plant involves the internal allocation of capacity. The expansion of the WWTP is required to meet the needs not only of Whitpain Township, but also those of East Norriton and Plymouth Townships.

### 7.2 CONSISTENCY DETERMINATIONS

As described in the preceding section, the selected plan does not involve projects for construction in or by Whitpain Township. The only sewerage project requiring construction would be the expansion of the existing WWTP by the ENPWJSA. The Township plan was evaluated and found to be consistent with the following requirements:

- ☑ **PA Title 25, Environmental Protection**
  - ✓ Chapter 71, *Act 537 Sewage Facilities Planning Program*
  - ✓ Chapter 93, *Water Quality Standards*. The sections of the Wissahickon Creek to which the Ambler WWTP discharges have been designated as "impaired streams" under section 303(d) of the Federal Clean Water Act. This plan does not conflict with any antidegradation requirements because it does not propose any increase in the permitted flow capacity of the Ambler WWTP. Additionally, the Schuylkill River, to which the ENPWJSA plant discharges, is not classified as a high quality or exceptional value stream.
  - ✓ Chapter 94, *Municipal Wasteload Management*. The ENPWJSA is currently under a connection prohibition. The selected plan would provide additional capacity in the plant.
  - ✓ Chapter 102, *Soil Erosion and Sedimentation Control*

- ☒ **PA State Water Plan**
- ☒ **PA Municipalities Planning Code (Act 247)**
- ☒ **PA Storm Water Management Act.** There is no approved stormwater management plan for Montgomery County. A study has been initiated but not completed nor approved, according to the PADEP.
- ☒ **Prime Agricultural Land Preservation Policy.** The stated policy of PADEP is to provide a review of new land development "because the availability of public sewer and water lines increases the probability that an area will be developed further." As shown, the selected plan does not propose any new sewerage construction.

As part of the regional Act 537 Plan, the ENPWJSA analyzed the proposed WWTP expansion for consistency with the following requirements:

- ☒ **PA Title 25, Environmental Protection**
  - ✓ Chapter 71, *Act 537 Sewage Facilities Planning Program*
  - ✓ Chapter 93, *Water Quality Standards.*
  - ✓ Chapter 94, *Municipal Wasteload Management.*
  - ✓ Chapter 95, *Wastewater Treatment Requirements*
  - ✓ Chapter 102, *Soil Erosion and Sedimentation Control*
  - ✓ Chapter 105, *Wetland Protection*
- ☒ **Federal Clean Water Act (Section 208).** Antidegradation requirements have been addressed by the effluent quality limits set by the PADEP.
- ☒ **PA Natural Diversity Inventory (PNDI).** PNDI searches were initiated by the ENPWJSA and a determination made by PADEP that there are no species of concern.
- ☒ **PA Historical Protection Act of 1978.** Submittals to the PA Historical and Museum Commission (PHMC) have been made by the ENPWJSA and the PHMC has determined that there are no areas of concern.

The details of the consistency determinations made by the ENPWJSA are contained in the regional Act 537 Plan.

### 7.3 ANTICIPATED IMPLEMENTATION SCHEDULE

The schedule for implementation of the selected wastewater treatment plant expansion is included in the regional Act 537 Plan prepared by the ENPWJSA. The tentative schedule for implementation, as contained in that report, may be summarized as follows:

Sewerage Project	Schedule
Completion of design	April 2007
Initiation of construction	August 2007
Substantial completion of WWTP expansion	January 2009



## 7.4 CAPITAL FINANCING PLAN

Financing of the selected sewerage plan can be expected to come from various sources:

- \$ **Available ENPWJSA Funds.** Each municipality, including Whitpain Township, has separate capital reserve accounts that are funded by the Townships, but held by the ENPWJSA. These funds would be liquidated to finance the WWTP expansion.
- \$ **Township Contribution.** Whitpain Township could contribute monies from its own sewer funds. The Township funding would be intended to maintain user costs at an affordable level.
- \$ **Bond Issue.** The balance of any capital project costs could be financed through a municipal bond issue. The annual debt service on the bond issue would be incorporated into the rates of existing sewer users.

## 8.0 INSTITUTIONAL ARRANGEMENTS

The institutional arrangements that currently exist are adequate to provide for the current and future sewerage service needs of Whitpain Township. Whitpain Township has the capabilities to implement the recommended wastewater facilities plan. The Township is responsible for all wastewater collection and conveyance within the municipality. Wastewater treatment is currently provided by regional authorities, including:

-  East Norriton-Plymouth-Whitpain Joint Sewer Authority (ENPWJSA)
-  Ambler Borough

As mentioned previously in this report, Whitpain has seats and voting rights on the regional ENPWJSA. There is no apparent need for any new institutional arrangements to provide for public sewerage service.

**Financial Status.** Whitpain Township currently has funds in the following approximate amounts:

Source	Amount
Capital Reserve Funds	\$
Debt Service Reserve Funds	
Bond Redemption & System Improvement Fund	
Total	

Whitpain Township has no outstanding debt related to the sanitary sewer system.

**Legal Authority.** Whitpain Township has the existing legal authority to:

- ☒ Implement the wastewater planning recommendations contained herein,
- ☒ Negotiate agreements with other parties,
- ☒ Raise capital for the construction of facilities,
- ☒ Set user rates to cover annual debt service requirements and provide for the operation and maintenance of facilities,
- ☒ Provide for system-wide operation and maintenance activities, and
- ☒ Take enforcement actions against ordinance violators in conjunction with the Township.

Operation and maintenance of the existing sanitary sewerage system is conducted with Township staff. Additionally, Township enforcement of local ordinances can be required for isolated significant events.

**Staffing.** The current practice of using Township public works crews to operate and maintain the sewer system and pumping stations continues to be functional.

**APPENDIX A**

**RESOLUTION FOR PLAN REVISION**



---

**RESOLUTION NO. \_\_\_\_\_**  
**RESOLUTION FOR PLAN REVISION**

WHEREAS, Section 5 of the Act of January 24, 1966, P.L. 1535, No. 537, known as the "Pennsylvania Sewage Facilities Act," as amended, and the Rules and Regulations of the Department of Environmental Protection adopted thereunder, Chapter 71 of Title 25 of the Pennsylvania Code, requires the municipality to adopt an Official Sewage Facilities Plan providing for sewage services adequate to prevent contamination of waters and/or environmental health hazards with sewage wastes, and to revise said plan whenever it is necessary to meet the sewage disposal needs of the municipality, and

WHEREAS, Whitpain Township has prepared and re-evaluated its prior revision, which provides for sewage facilities in the Township of Whitpain, and

WHEREAS, Whitpain Township finds that the Facility Plan described above conforms to applicable zoning, subdivision, other municipal ordinances and plans and to a comprehensive program of pollution control and water quality management.

NOW, THEREFORE, BE IT RESOLVED that the Supervisors of the Township of Whitpain hereby adopts and submits to the Department of Environmental Protection for its approval as a revision to its already approved "Official Plan" of the municipality, the above referenced facility plan. The Township hereby assures the Department of the complete and timely implementation of the said plan as required by Section 5 of the Pennsylvania Sewage Facilities Act, as amended.

The selected plan calls for the continued collection and conveyance of wastewater from Whitpain Township to treatment plants owned by the East Norriton-Plymouth-Whitpain Joint Sewerage Authority (ENPWJSA) and the Ambler Jointure. The plan requires the expansion of the ENPWJSA plant to increase Whitpain Township's allocated capacity from 3.1 to 3.5 mgd. The target implementation date for completion of the ENPWJSA plant expansion is January, 2009.

I, Phyllis C. Lieberman, Township Manager for the Whitpain Township Board of Supervisors, hereby certify that the foregoing is a true copy of Township resolution No. \_\_\_\_\_ adopted on \_\_\_\_\_, 2006.

AUTHORIZED SIGNATURE

Township Seal

\_\_\_\_\_  
Township Manager

**PUBLIC NOTICE**

As required by the Pennsylvania Sewage Facilities Act (Act 537), Whitpain Township hereby gives notice that it intends to revise the official sewage facilities plan of the Township.

The selected plan calls for the continued collection and conveyance of wastewater from Whitpain Township to treatment plants owned by the East Norriton-Plymouth-Whitpain Joint Sewerage Authority (ENPWJSA) and the Ambler Jointure. The plan requires the expansion of the ENPWJSA plant to increase Whitpain Township's allocated capacity from 3.1 to 3.5 mgd. The target implementation date for completion of the ENPWJSA plant expansion is January, 2009.

A thirty (30) day public comment period has been established. A copy of the revised plan is available for public inspection and will be available for inspection at the Whitpain Township Building, 960 Wentz Road, Blue Bell, PA 19422. All comments regarding the proposed plan revision shall be in writing and will be forwarded to the Department of Environment Protection along with the plan revision.

After the thirty (30) day public comment period, Whitpain Township plans to adopt the plan revision and forward, by resolution, to the Department of Environmental Protection for approval.

**APPENDIX B**

**TEMPORARY FLOW METERING DATA**

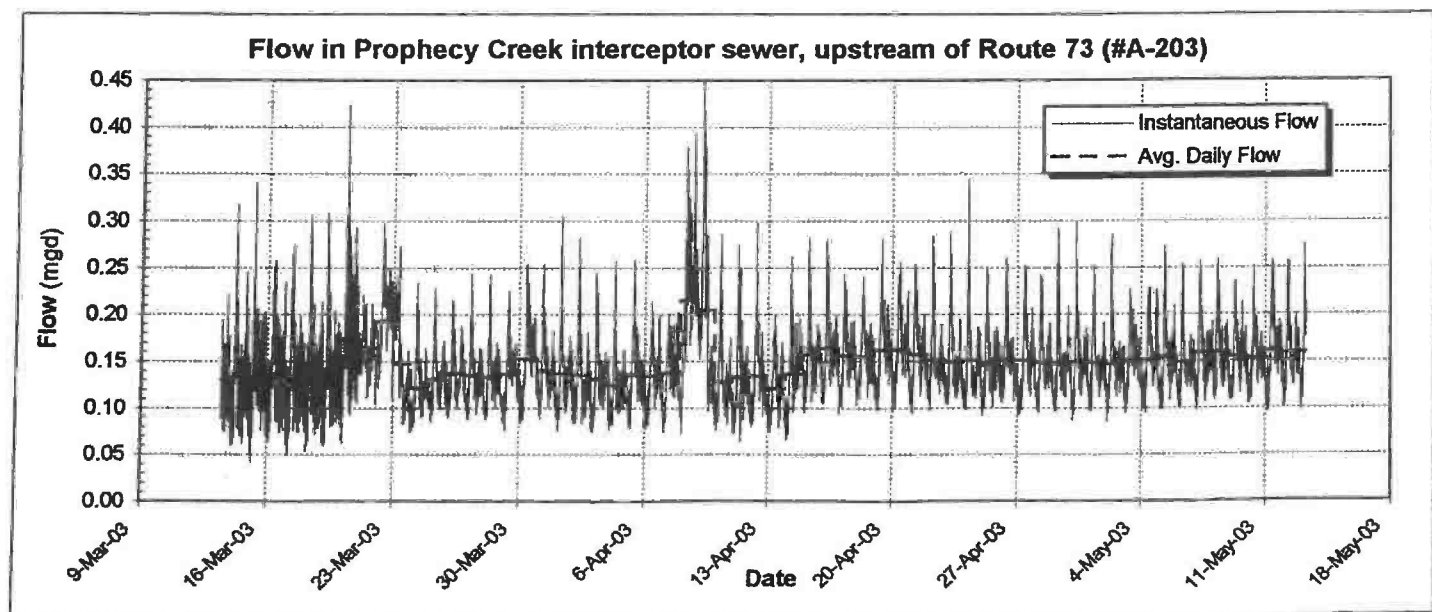
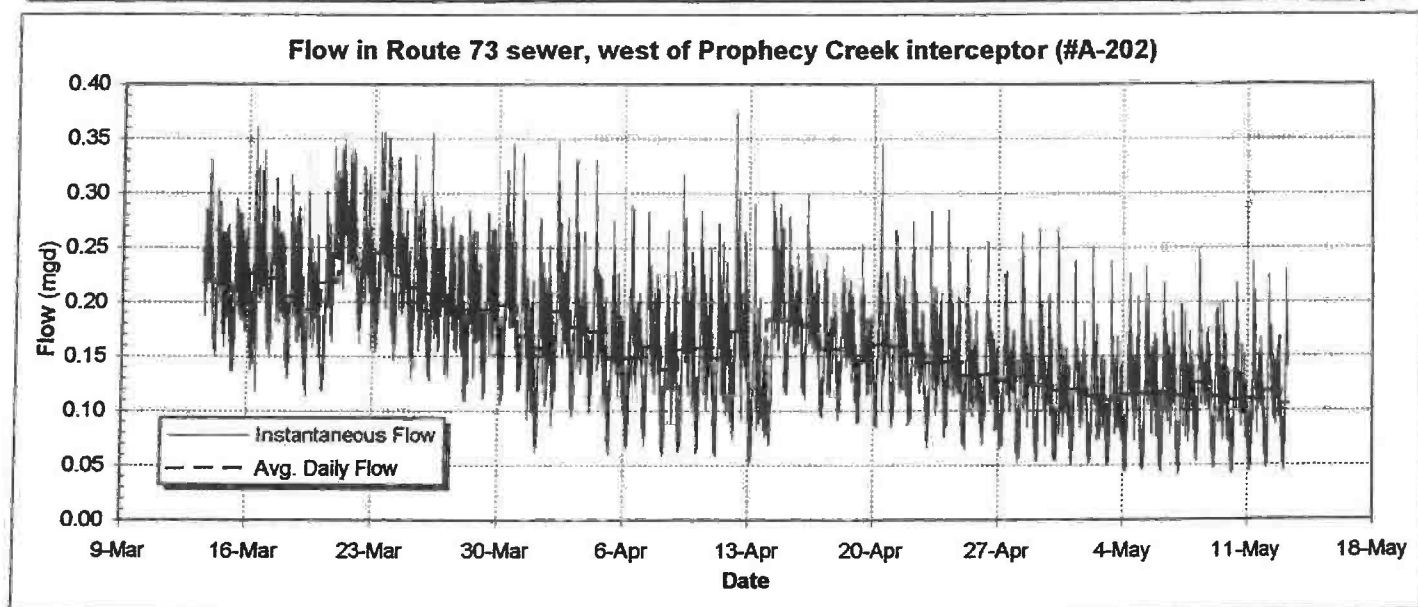
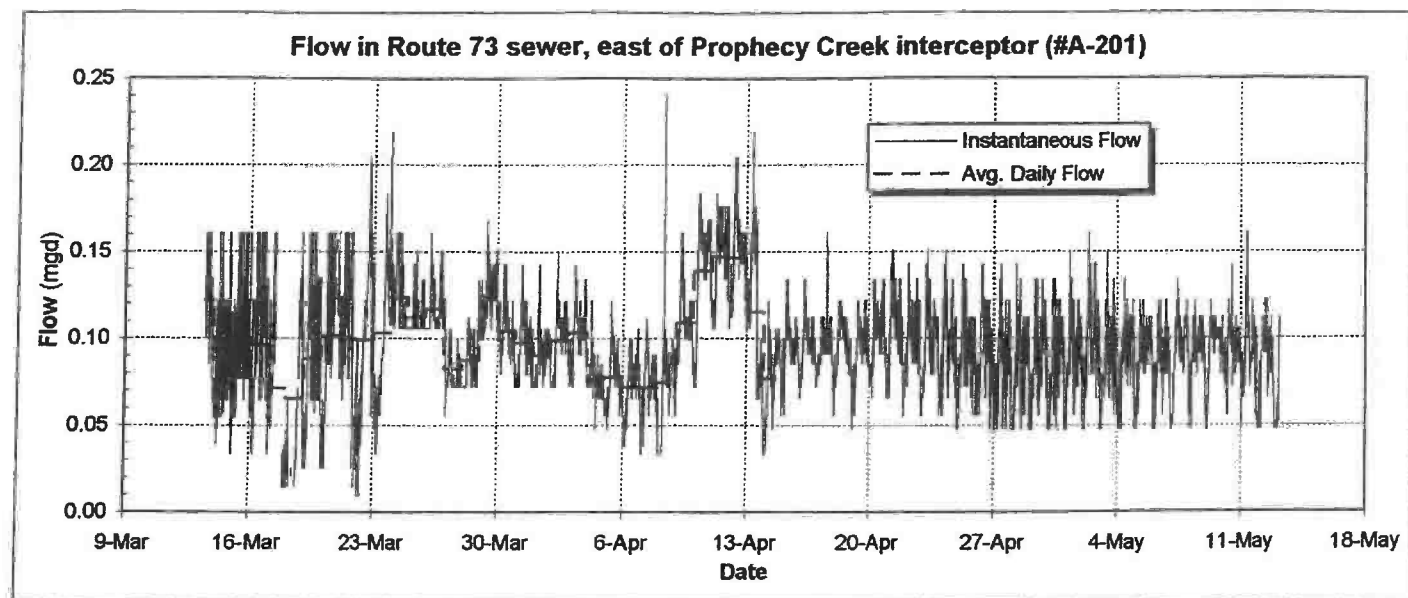


FIGURE 4-3: FLOWS TO PROPHECY CREEK INTERCEPTOR AT RTE. 73

## Flow in Greystone Road sewer, at Detweiler Lane (#A-101)

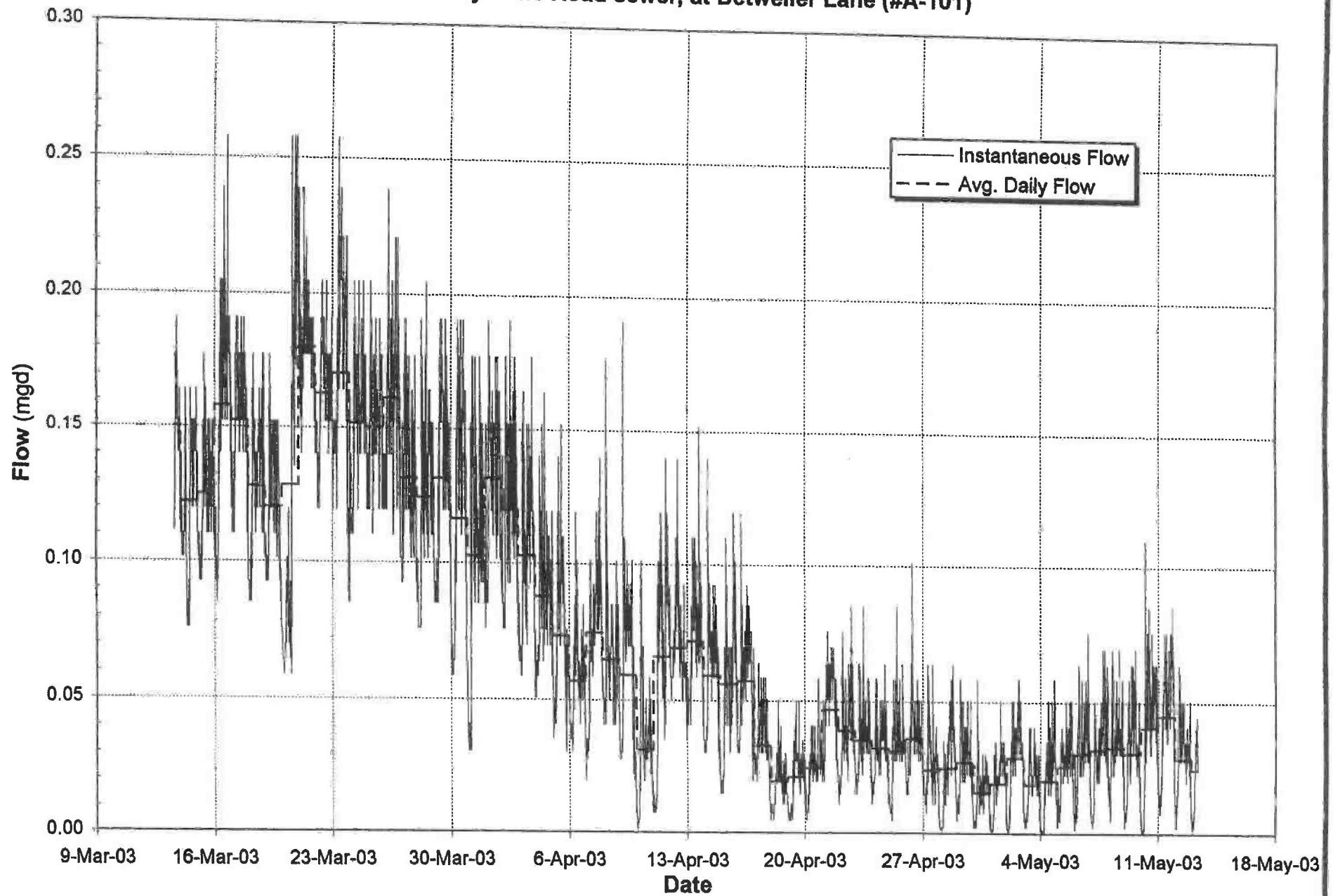


FIGURE 4-4

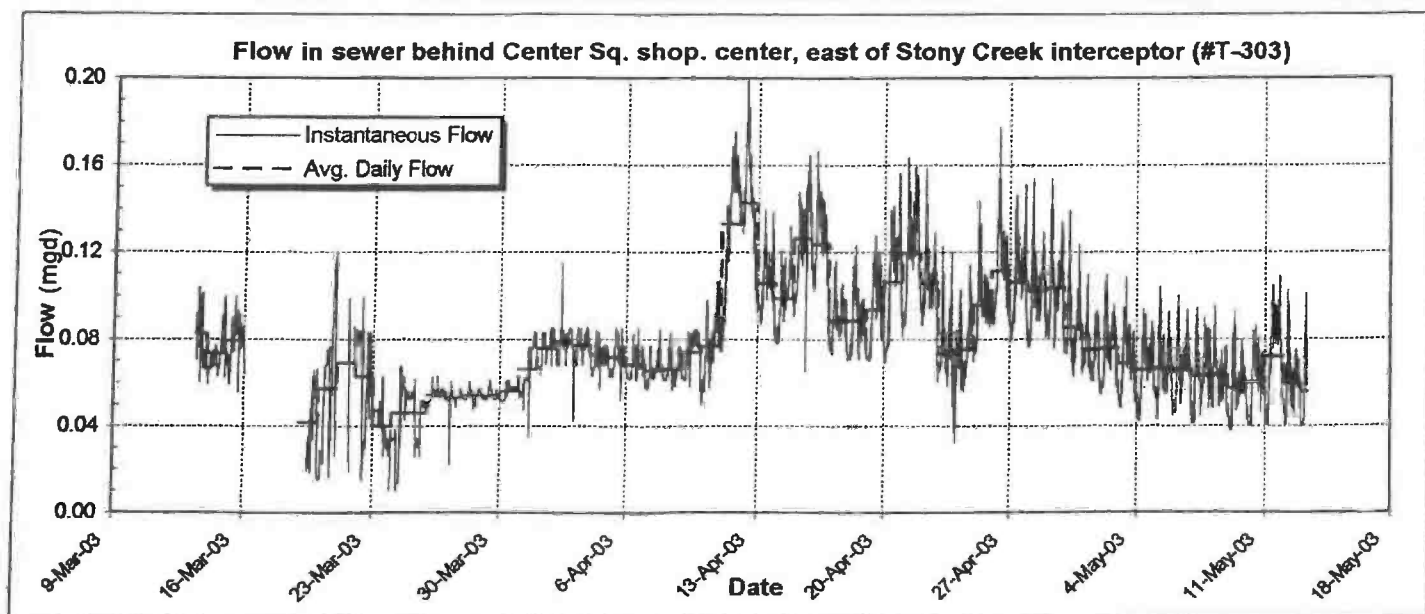
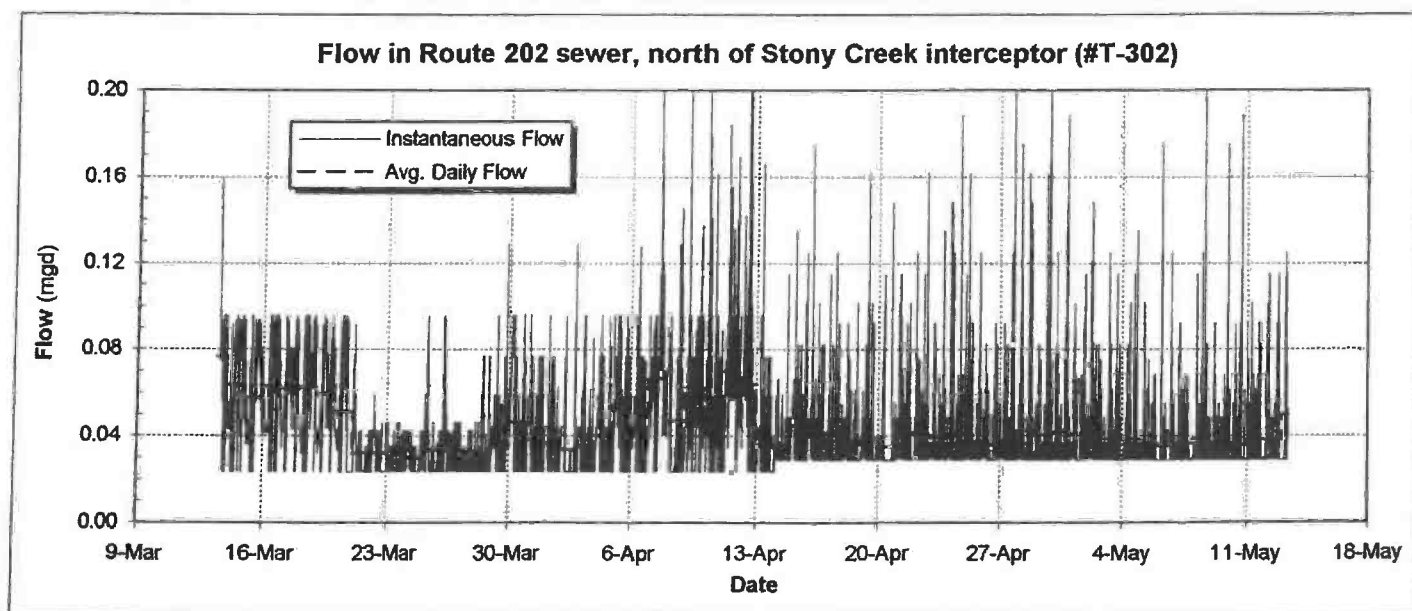
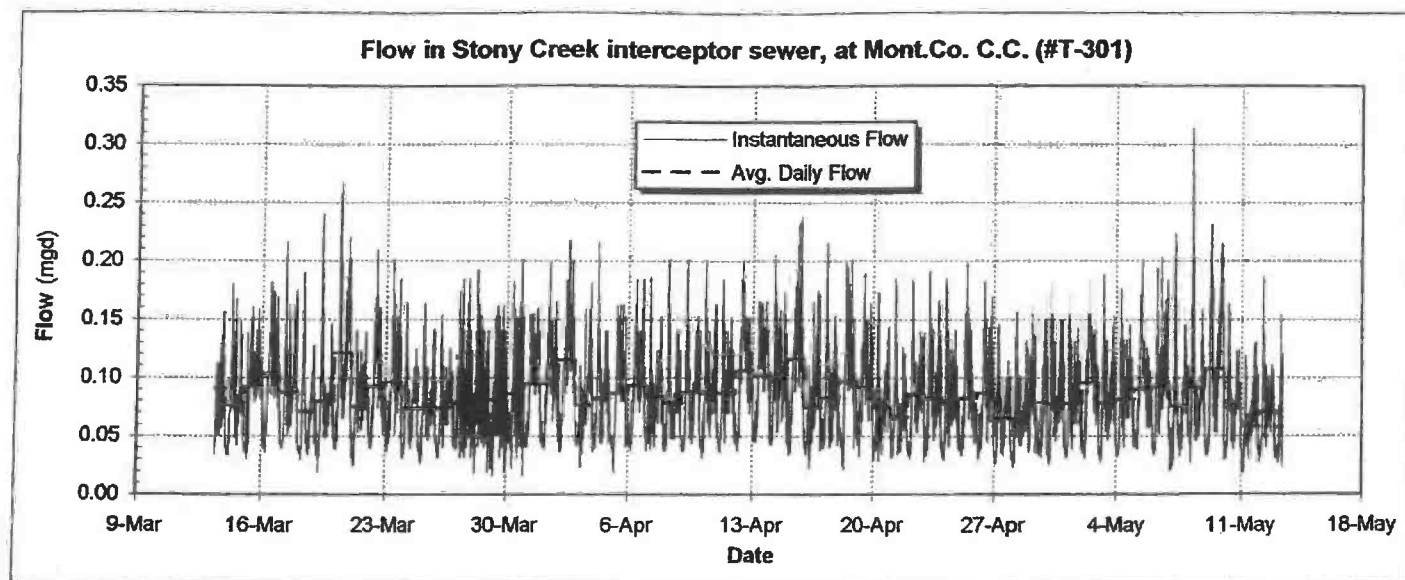


FIGURE 4-5: FLOWS TO STONY CREEK INTERCEPTOR AT UPPER END

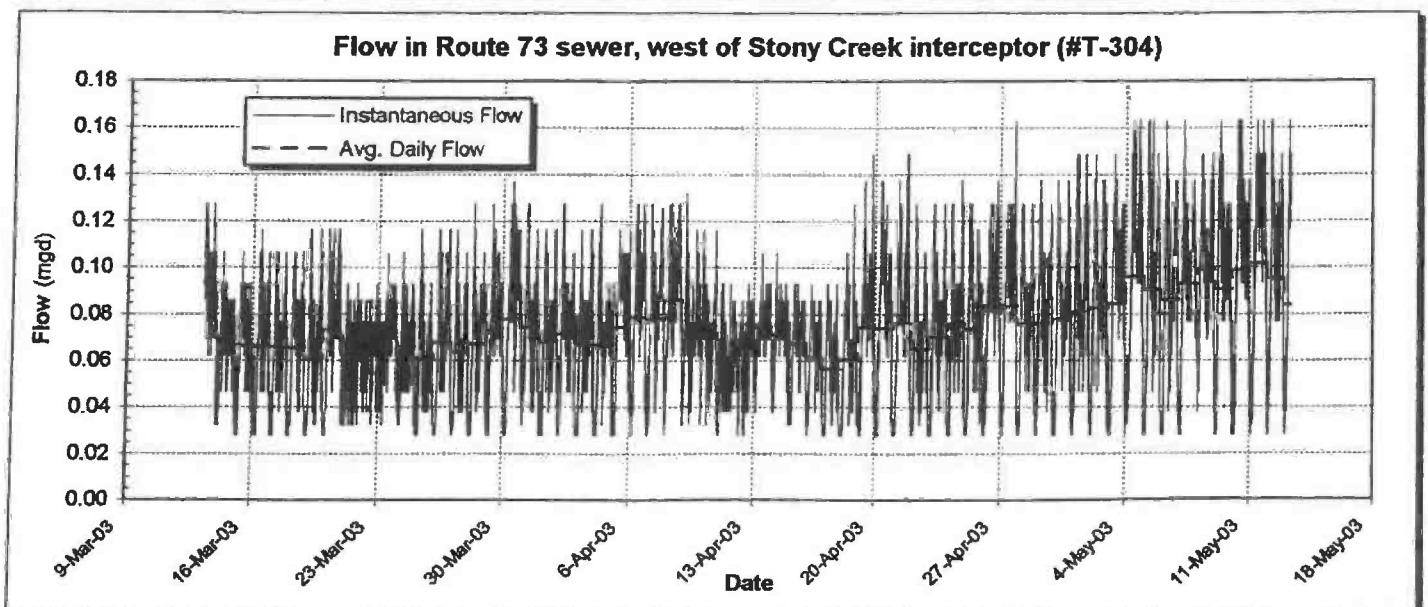
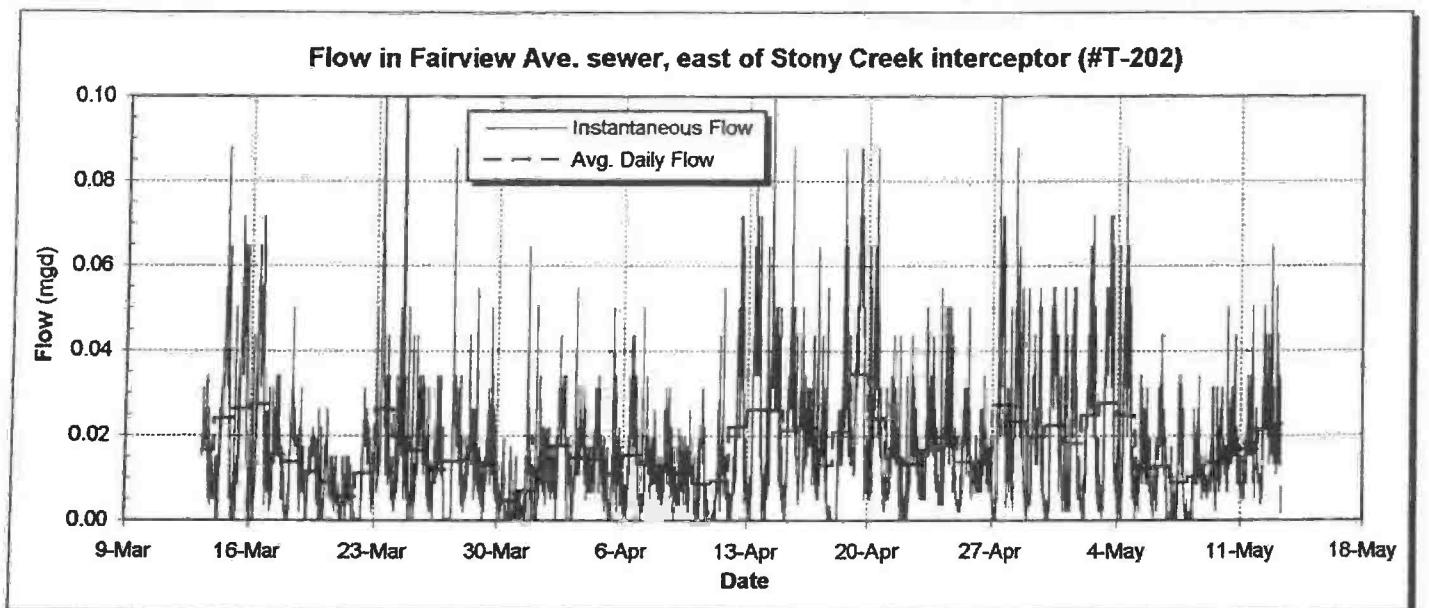
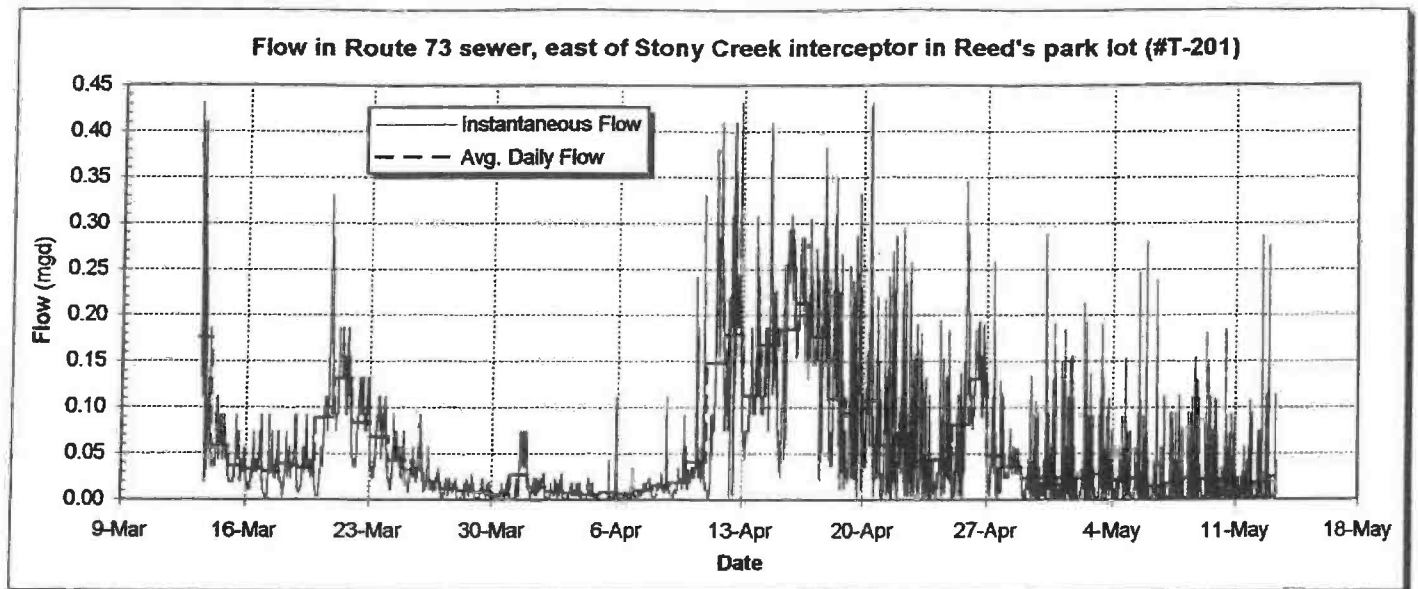


FIGURE 4-6: FLOWS TO STONY CREEK INTERCEPTOR AT RTE. 73, WEST OF RTE. 202

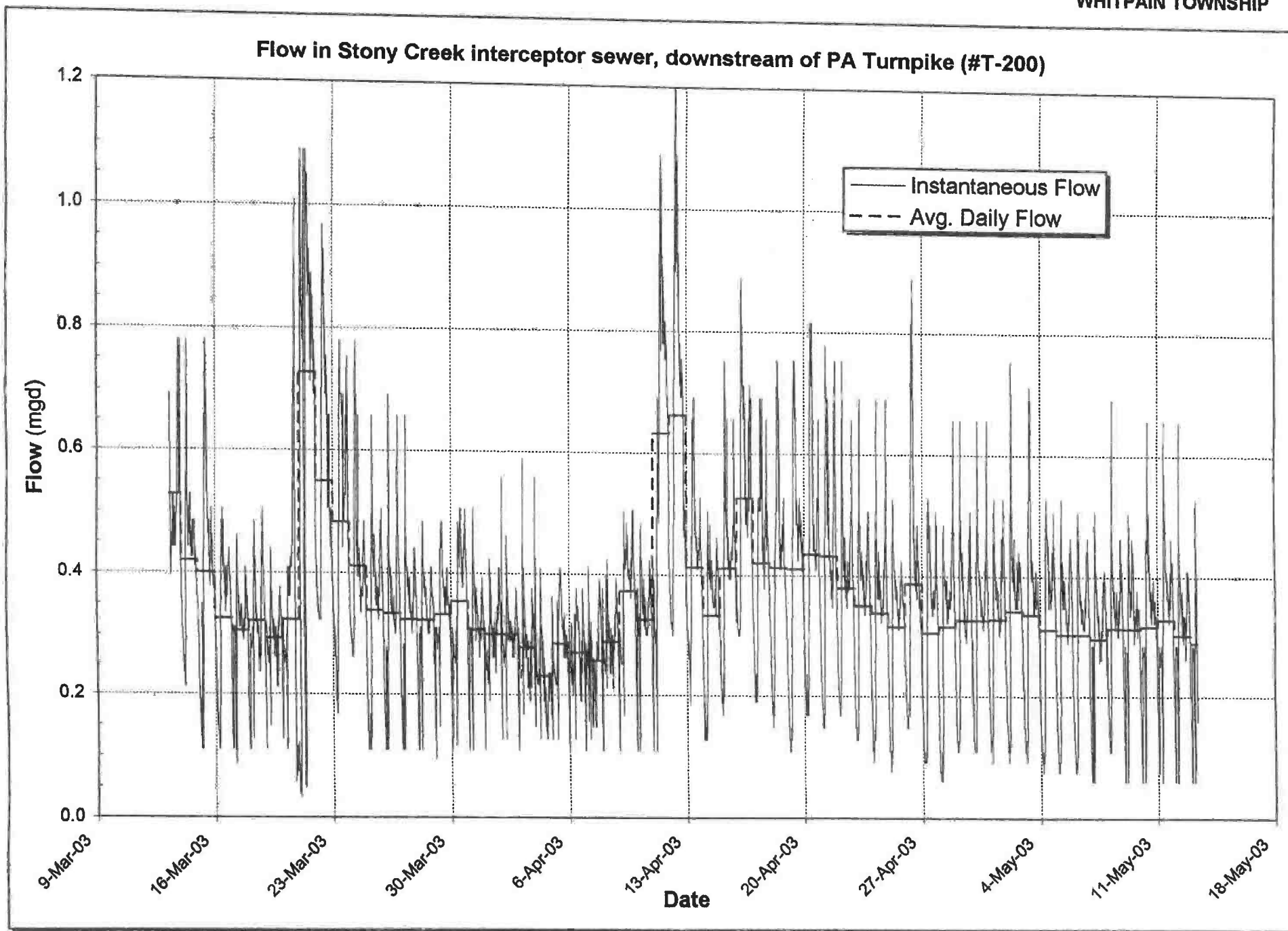


FIGURE 4-7



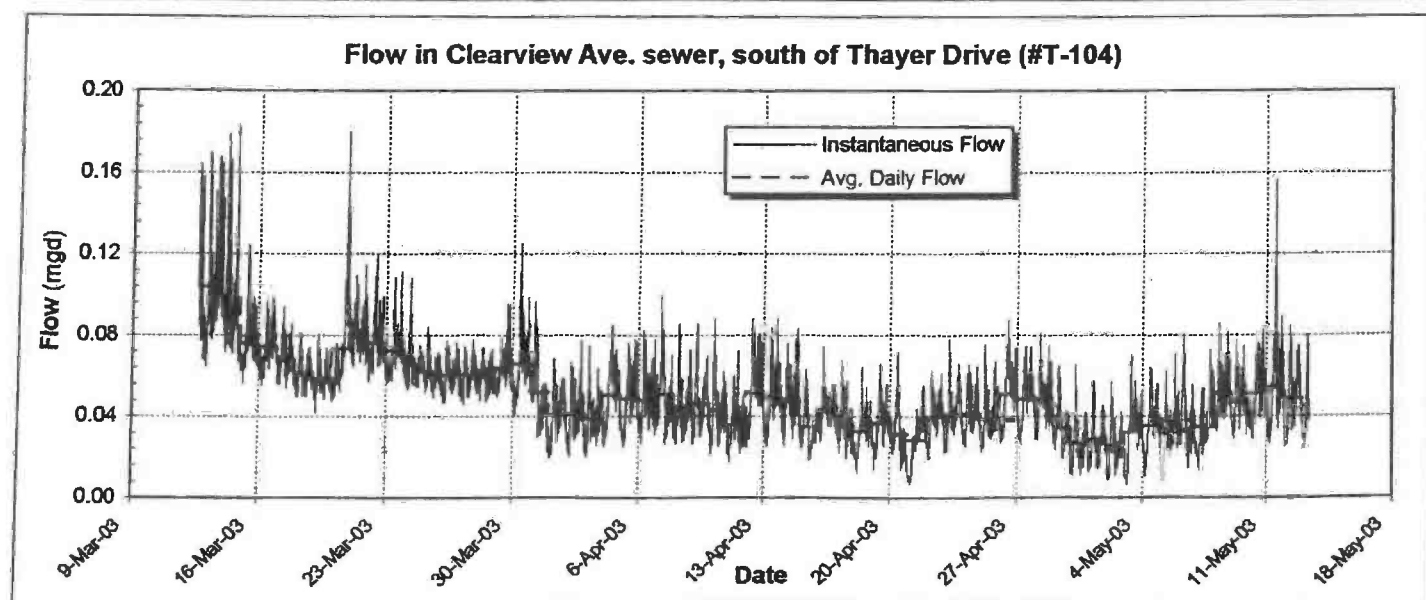
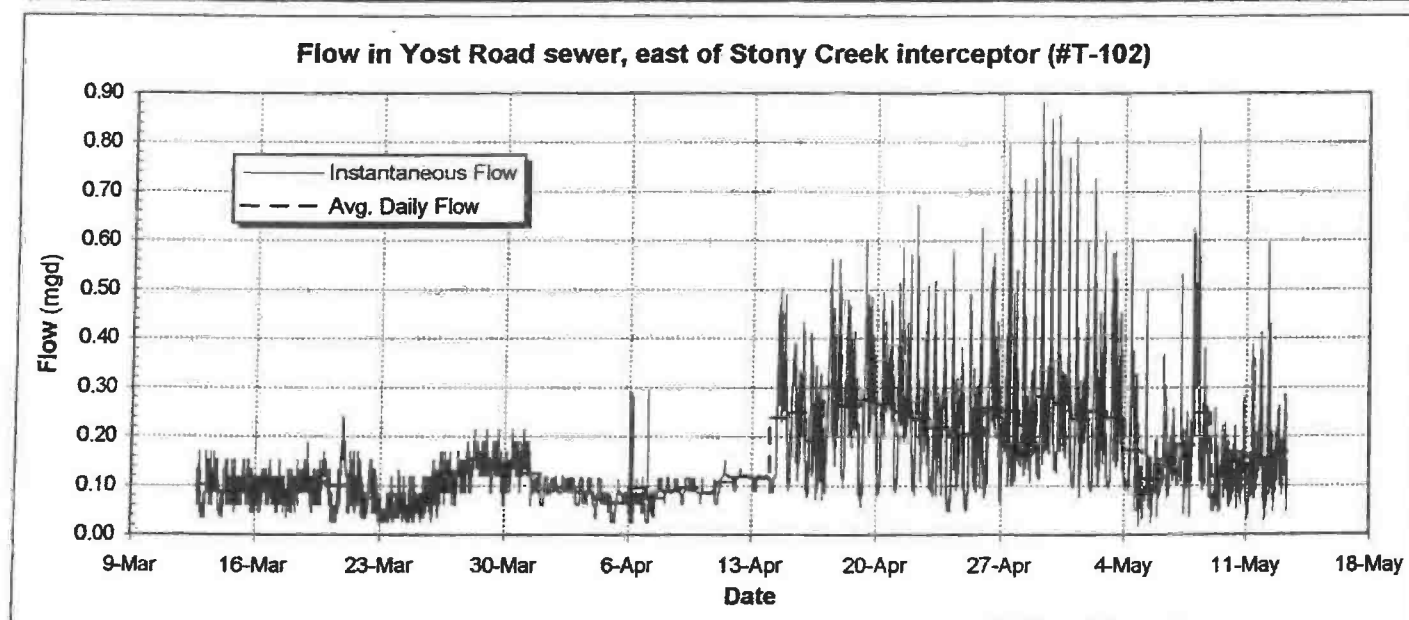
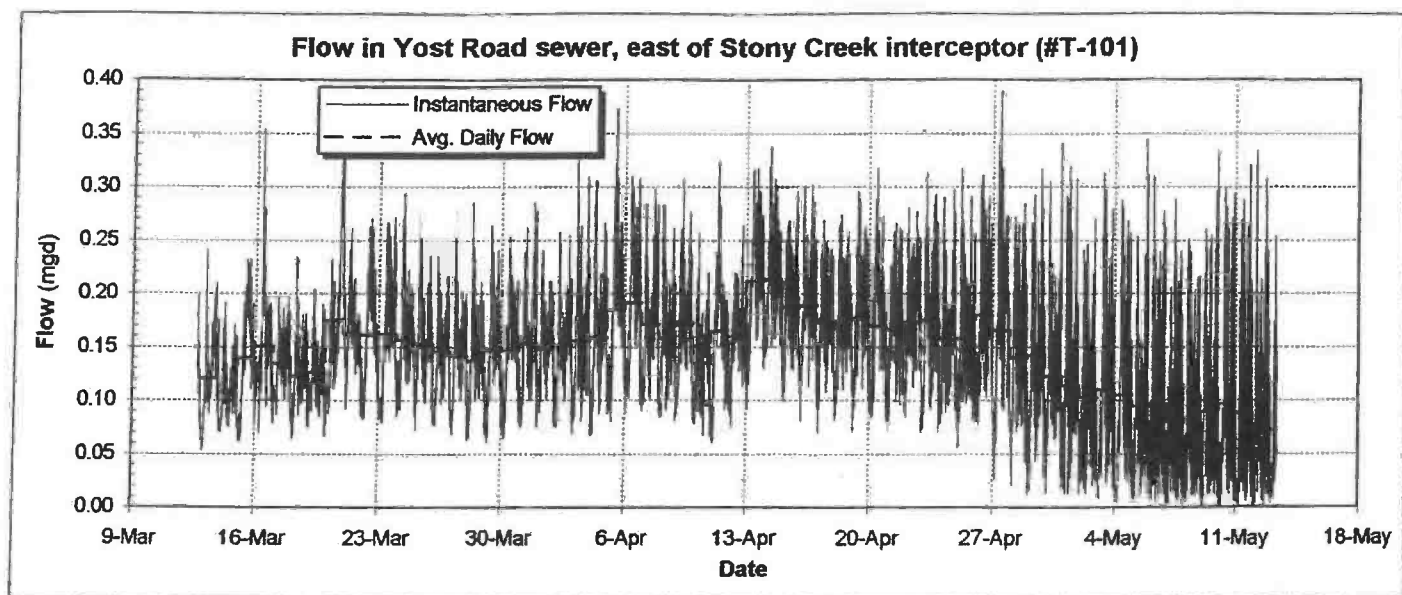


FIGURE 4-8: FLOWS TO STONY CREEK INTERCEPTOR NEAR YOST ROAD

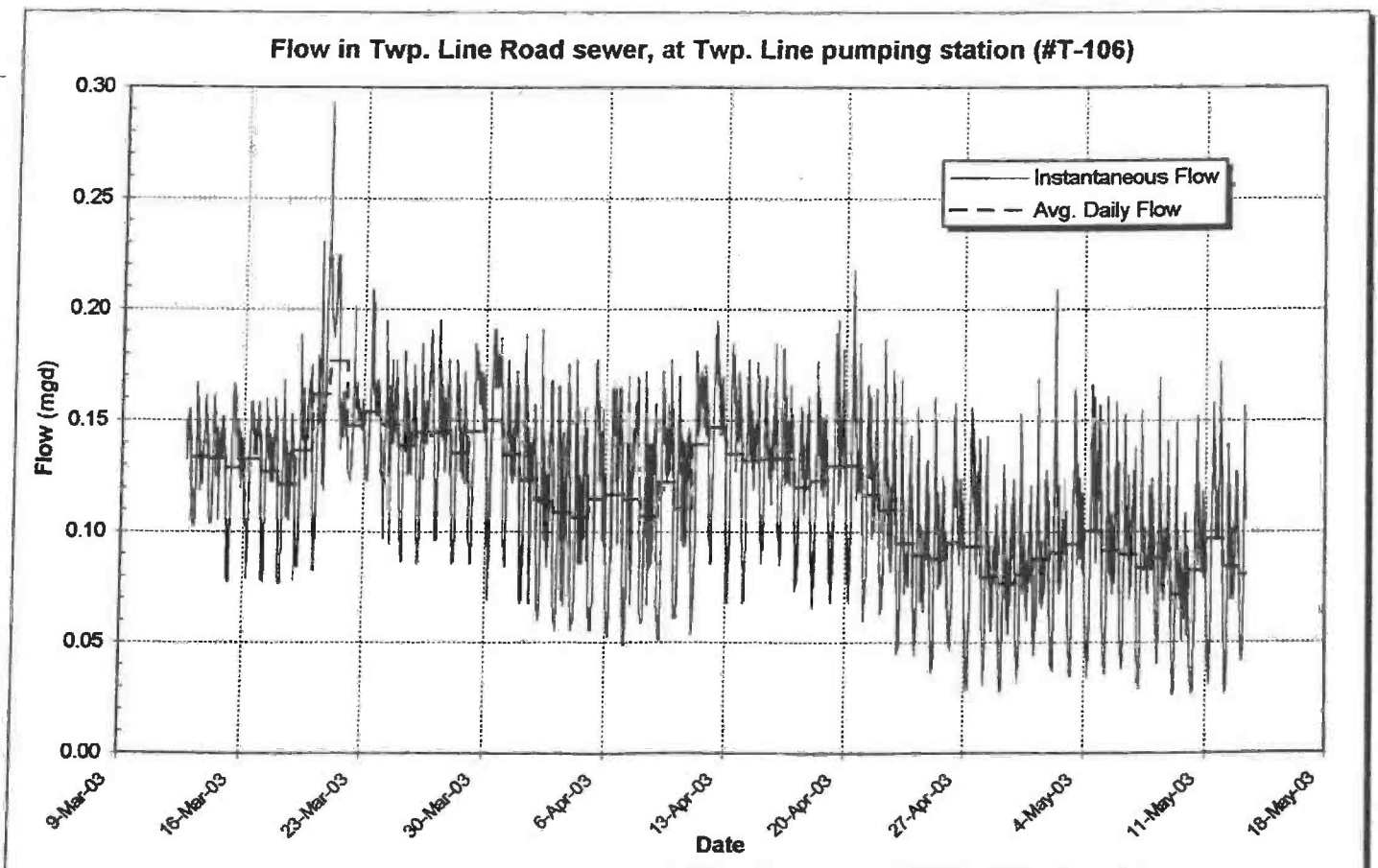
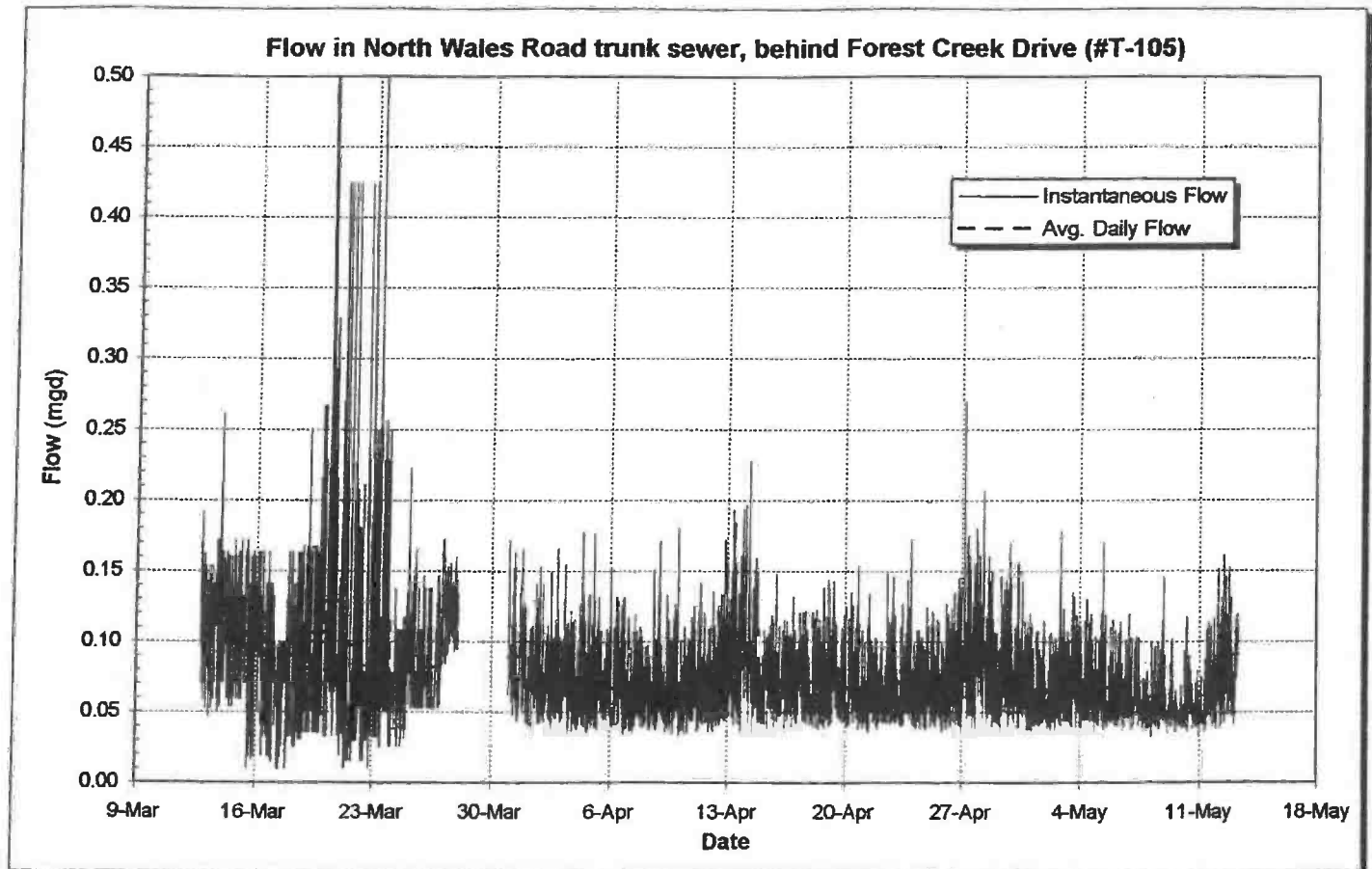


FIGURE 4-9: FLOWS TO TWP. LINE PUMPING STATION

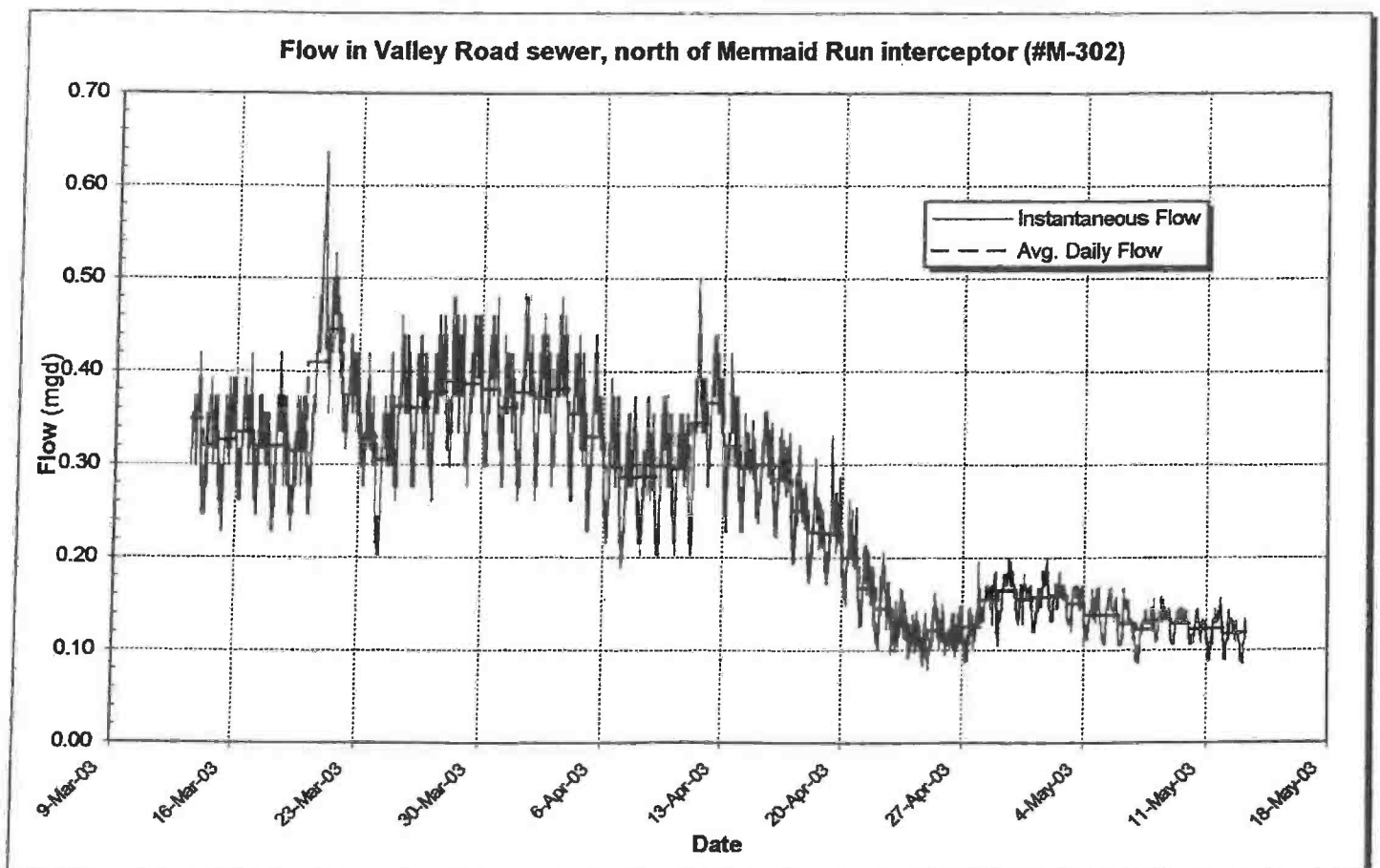
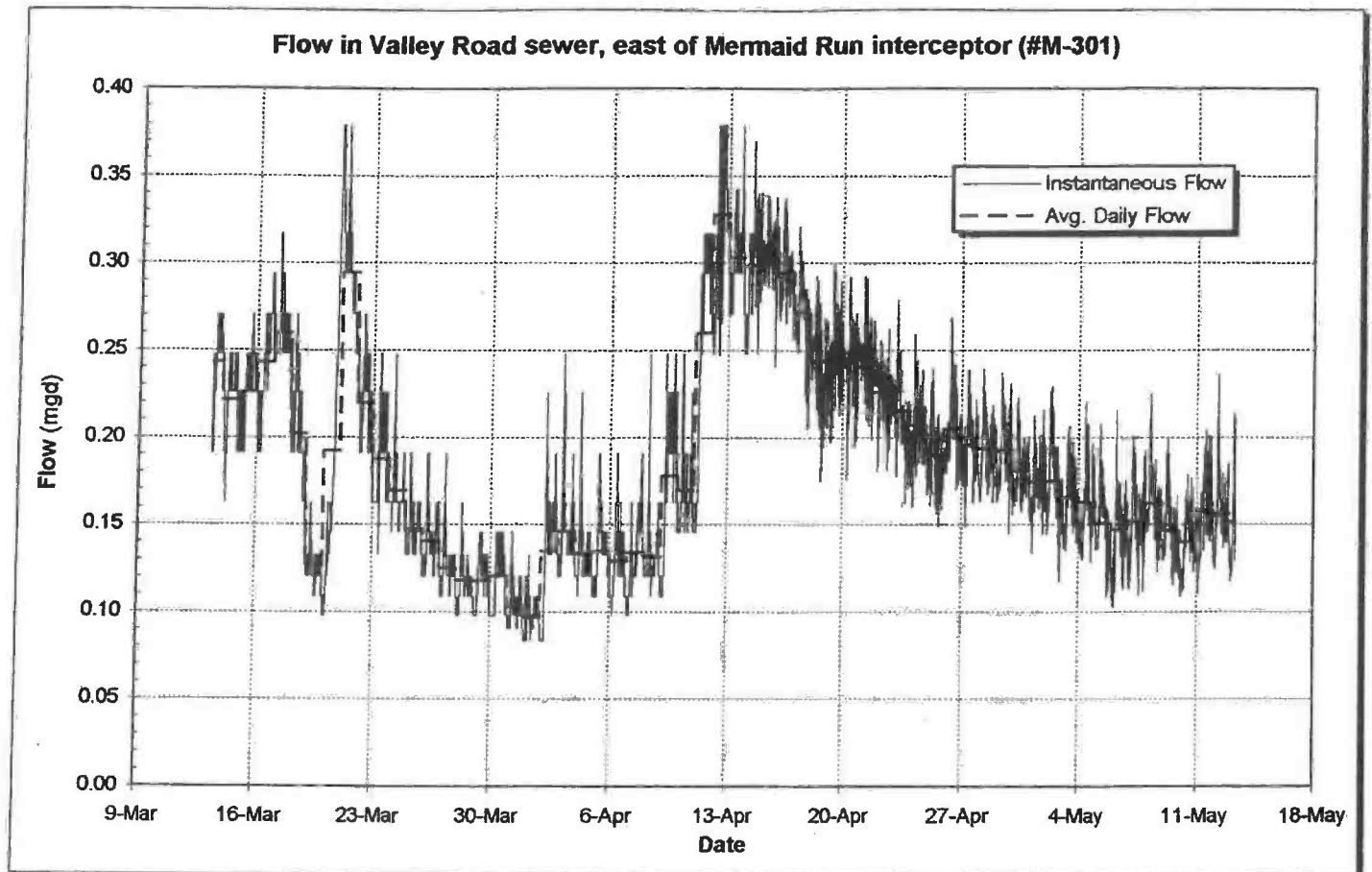
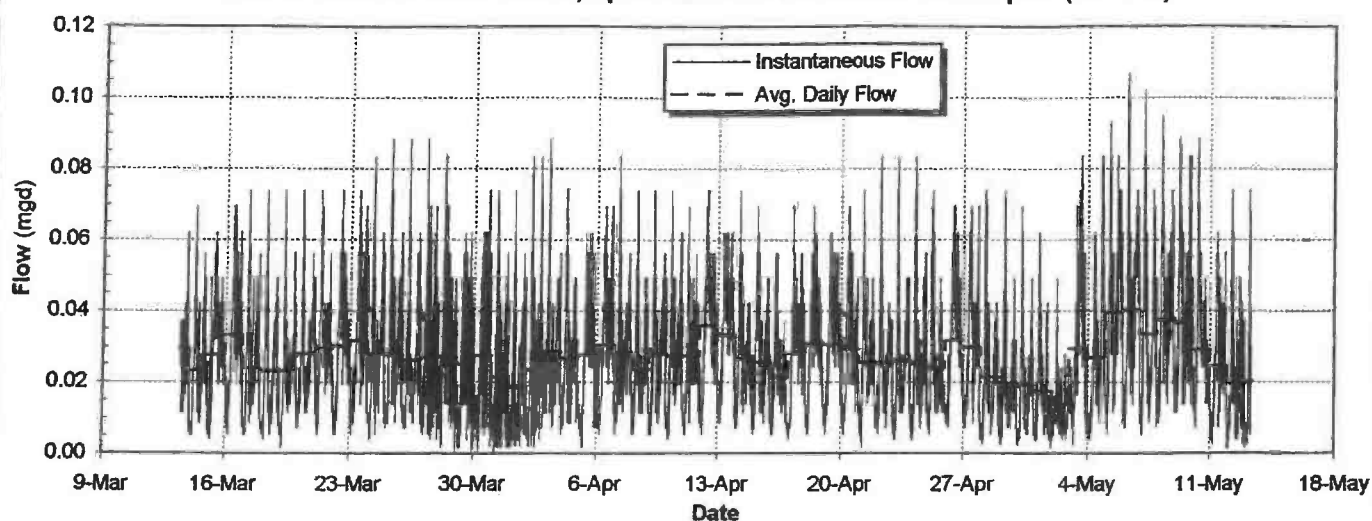
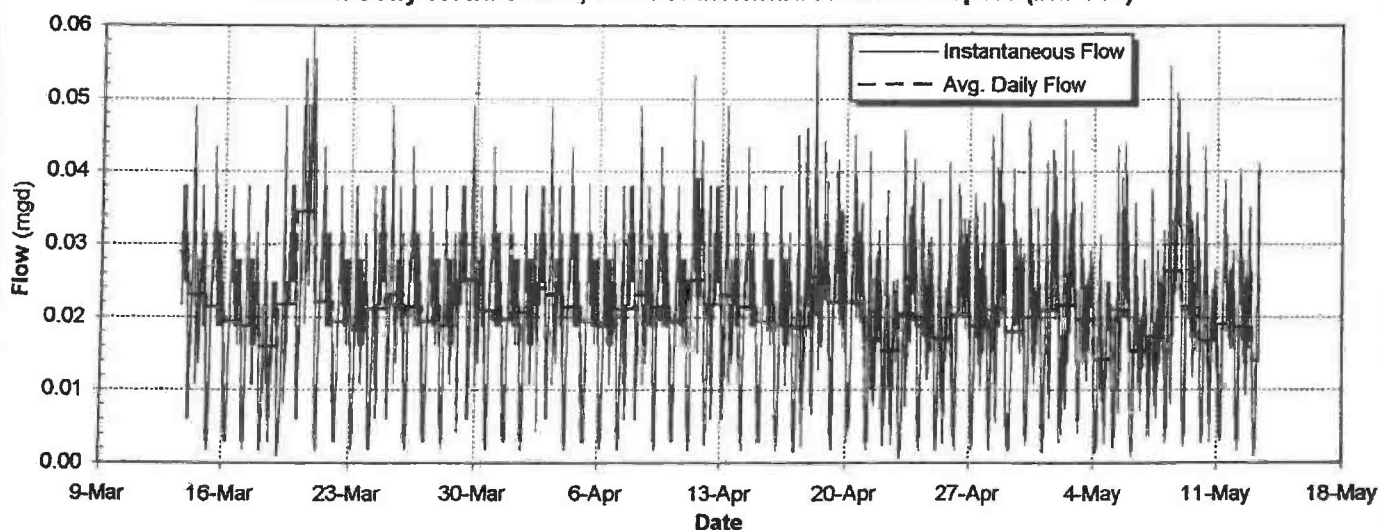


FIGURE 4-10: FLOWS TO MERMAID RUN INTERCEPTOR AT UPPER END

Flow in Holstein Court sewer, upstream of Mermaid Run interceptor (#M-112)



Flow in Jolly Road sewer, west of Mermaid Run interceptor (#M-113)



Flow in Jolly Road sewer, east of Mermaid Run interceptor (#M-201)

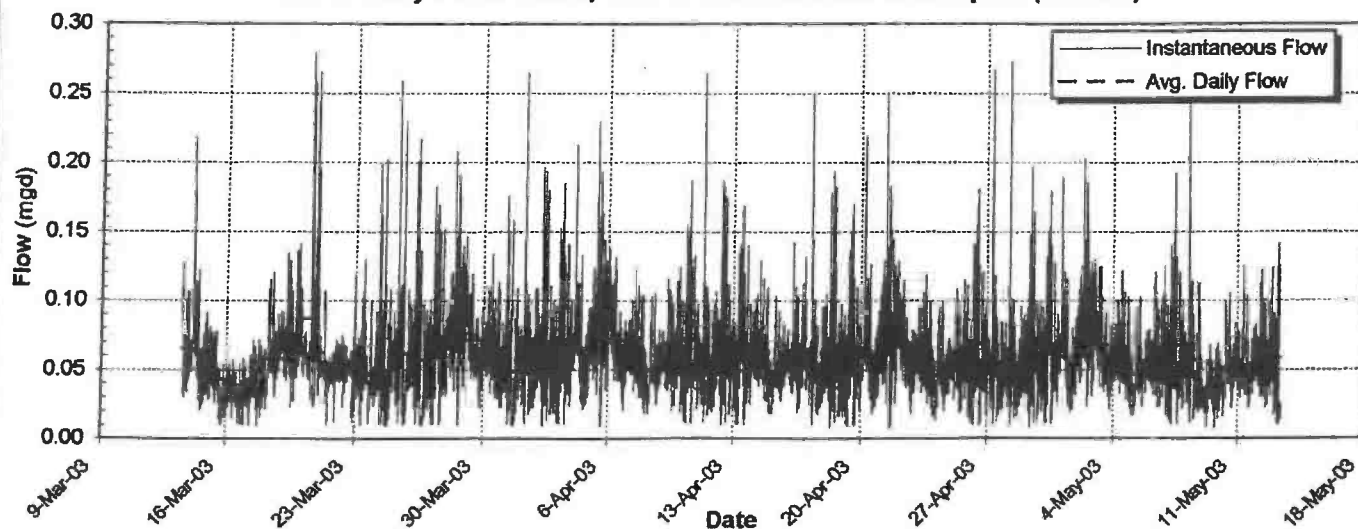


FIGURE 4-11: FLOWS TO MERMAID RUN INTERCEPTOR AT JOLLY ROAD

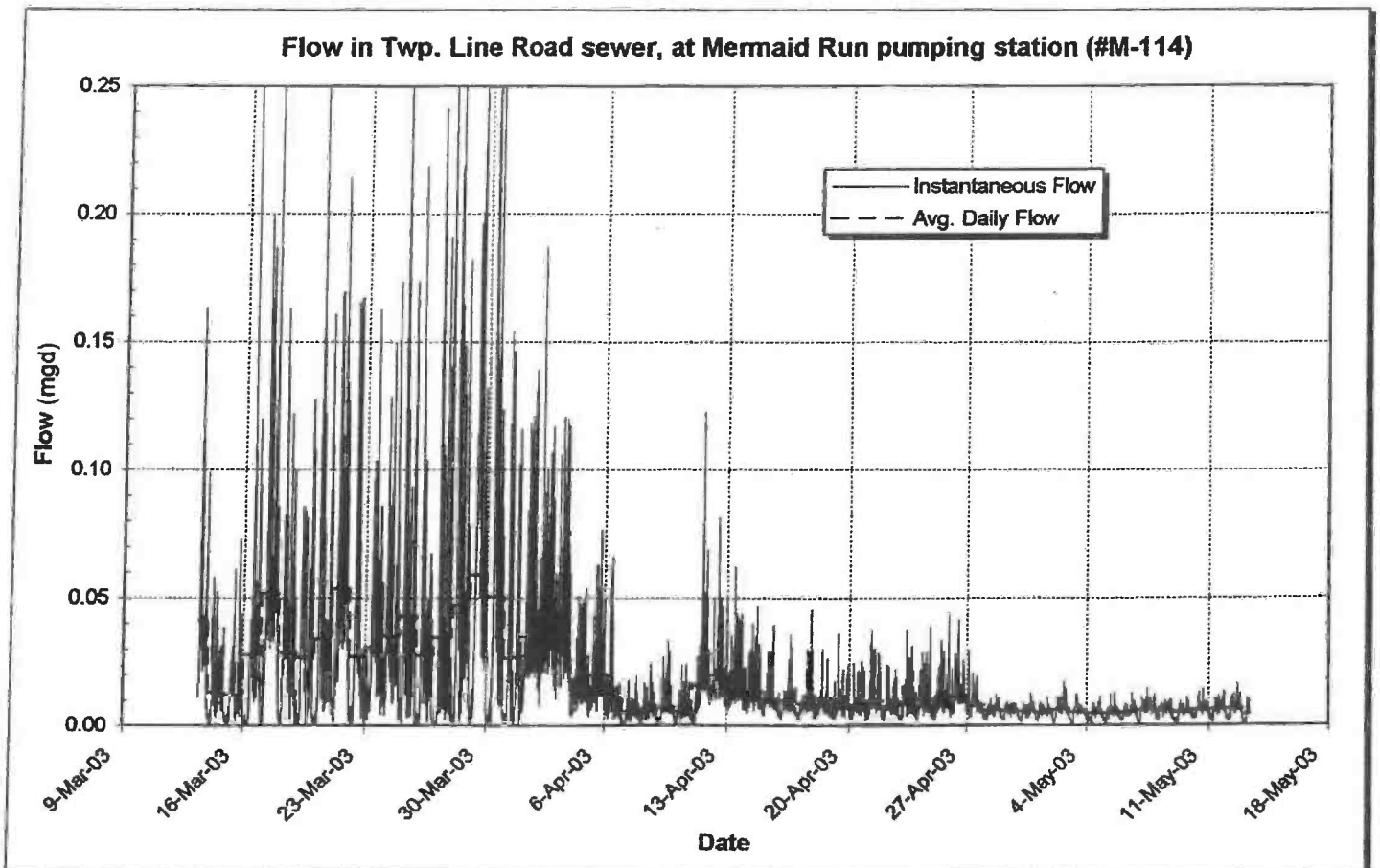
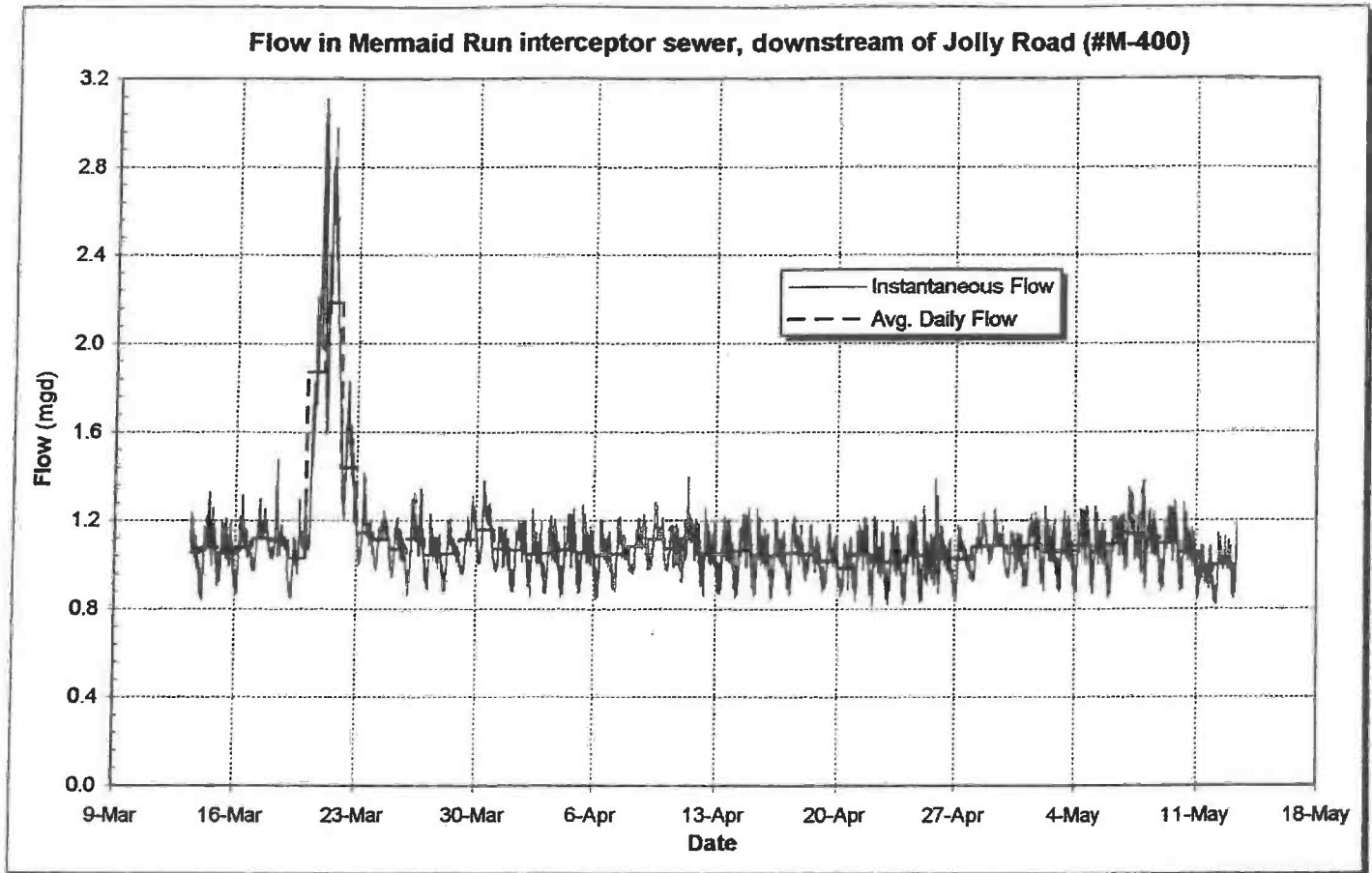


FIGURE 4-12: FLOWS TO MERMAID RUN PUMPING STATION

**TABLE 4-1  
SUMMARY OF METERED FLOWS  
AMBLER SEWER DISTRICT**

		Avg. Daily Flow (mgd)								
		Beale Road Pump Sta.	Route 73E collector sewers	Route 73W collector sewers	Prophecy Int. upstream of Rte 73	Prophecy Interceptor at Route 73	Graystone Rd & Butler Pk sewers	Prophecy Int. upstream of Morris Rd	Prophecy Interceptor Total	Joint Interceptor @ Butler Pk
		op. time	A-201	A-202	A-203	Subtotal	A-101	Subtotal	A100	Inf meter
Date	Precip. (inches)									
13-Mar-03	0.10									
14-Mar-03			0.088	0.217	0.133	0.438	0.122	0.560	0.906	0.826
15-Mar-03			0.100	0.210	0.133	0.443	0.125	0.568	0.890	0.783
16-Mar-03			0.096	0.226	0.136	0.458	0.158	0.616	0.872	0.764
17-Mar-03			0.071	0.222	0.134	0.427	0.152	0.579	0.863	0.762
18-Mar-03			0.065	0.205	0.135	0.406	0.128	0.534	0.829	0.739
19-Mar-03	0.30		0.088	0.193	0.138	0.419	0.120	0.539	0.771	0.715
20-Mar-03	1.15		0.101	0.217	0.174	0.492	0.129	0.621	0.935	0.748
21-Mar-03	0.10		0.100	0.274	0.164	0.538	0.180	0.718	1.091	0.790
22-Mar-03			0.099	0.231	0.193	0.522	0.163	0.685	0.976	0.822
23-Mar-03			0.103	0.244	0.147	0.494	0.171	0.665	0.941	0.822
24-Mar-03			0.123	0.224	0.121	0.469	0.152	0.620	0.880	0.819
25-Mar-03			0.112	0.213	0.131	0.455	0.150	0.605	0.824	0.790
26-Mar-03	0.40		0.117	0.208	0.137	0.461	0.161	0.622	0.803	0.745
27-Mar-03			0.083	0.196	0.135	0.413	0.132	0.545	0.780	0.715
28-Mar-03			0.087	0.193	0.133	0.414	0.124	0.538	0.749	0.683
29-Mar-03	0.30		0.125	0.193	0.136	0.453	0.132	0.585	0.728	0.701
30-Mar-03	0.27		0.104	0.197	0.153	0.453	0.116	0.570	0.754	0.754
31-Mar-03			0.097	0.168	0.140	0.405	0.103	0.507	0.731	0.766
1-Apr-03	0.25		0.090	0.157	0.136	0.383	0.132	0.515	0.714	0.736
2-Apr-03			0.099	0.192	0.135	0.425	0.120	0.545	0.717	0.726
3-Apr-03			0.103	0.177	0.131	0.411	0.103	0.514	0.710	0.703
4-Apr-03			0.076	0.173	0.124	0.373	0.088	0.460	0.696	0.668
5-Apr-03	0.10		0.078	0.148	0.136	0.361	0.073	0.435	0.708	0.700
6-Apr-03			0.072	0.149	0.134	0.354	0.057	0.411	0.729	0.714
7-Apr-03	0.60		0.072	0.159	0.138	0.368	0.075	0.443	0.721	0.692
8-Apr-03	0.26		0.075	0.138	0.216	0.428	0.065	0.493	0.715	0.694
9-Apr-03	0.25		0.109	0.156	0.204	0.469	0.059	0.528	0.806	0.722
10-Apr-03	0.50		0.139	0.158	0.128	0.424	0.031	0.456	0.756	0.720
11-Apr-03	0.60		0.147	0.149	0.132	0.428	0.066	0.494	0.910	0.740
12-Apr-03			0.146	0.173	0.134	0.453	0.070	0.523	0.932	0.773
13-Apr-03			0.115	0.121	0.121	0.356	0.072	0.428	0.886	0.761
14-Apr-03			0.077	0.184	0.137	0.397	0.059	0.457	0.820	0.733
15-Apr-03			0.094	0.183	0.157	0.434	0.056	0.490	0.823	0.720
16-Apr-03			0.095	0.178	0.163	0.437	0.057	0.495	0.837	0.714
17-Apr-03			0.097	0.157	0.155	0.409	0.033	0.442	0.789	0.693
18-Apr-03	0.15		0.095	0.157	0.155	0.406	0.020	0.426	0.783	0.671
19-Apr-03			0.093	0.151	0.162	0.405	0.021	0.427	0.767	0.659



**TABLE 4-1  
SUMMARY OF METERED FLOWS  
AMBLER SEWER DISTRICT**

Date	Precip. (inches)	Avg. Daily Flow (mgd)								
		Beale Road Pump Sta. op. time	Route 73E collector sewers A-201	Route 73W collector sewers A-202	Prophecy Int. upstream of Rte 73 A-203	Prophecy Interceptor at Route 73 Subtotal	Greystone Rd & Butler Pk sewers A-101	Prophecy Int. upstream of Morris Rd Subtotal	Prophecy Interceptor Total A100	Joint Interceptor @ Butler Pk Int meter
20-Apr-03			0.101	0.161	0.162	0.423	0.025	0.448	0.787	0.648
21-Apr-03	0.15		0.103	0.159	0.157	0.420	0.047	0.467	0.748	0.654
22-Apr-03			0.097	0.152	0.152	0.401	0.039	0.440	0.703	0.645
23-Apr-03			0.098	0.144	0.149	0.391	0.035	0.427	0.705	0.653
24-Apr-03			0.093	0.145	0.150	0.388	0.032	0.420	0.702	0.643
25-Apr-03	0.35		0.091	0.132	0.145	0.368	0.031	0.399	0.668	0.617
26-Apr-03	0.25		0.093	0.133	0.151	0.376	0.036	0.413	0.701	0.603
27-Apr-03			0.084	0.127	0.151	0.362	0.024	0.386	0.675	0.579
28-Apr-03			0.085	0.132	0.148	0.365	0.025	0.390	0.648	0.560
29-Apr-03			0.087	0.123	0.146	0.357	0.027	0.384	0.625	0.558
30-Apr-03	0.05		0.086	0.118	0.150	0.355	0.016	0.371	0.614	0.546
1-May-03	NA		0.090	0.120	0.148	0.358	0.019	0.377	0.608	0.558
2-May-03			0.095	0.113	0.147	0.355	0.029	0.384	0.601	0.591
3-May-03			0.085	0.109	0.151	0.345	0.019	0.364	0.610	0.577
4-May-03			0.085	0.114	0.151	0.351	0.020	0.371	0.622	0.553
5-May-03			0.089	0.115	0.154	0.359	0.026	0.384	0.613	0.533
6-May-03			0.088	0.117	0.149	0.353	0.031	0.384	0.600	0.507
7-May-03			0.092	0.113	0.158	0.364	0.032	0.396	0.601	0.497
8-May-03			0.092	0.126	0.159	0.377	0.033	0.410	0.656	0.591
9-May-03			0.093	0.113	0.154	0.360	0.031	0.391	0.586	0.564
10-May-03			0.093	0.110	0.152	0.355	0.041	0.396	0.588	0.538
11-May-03			0.092	0.110	0.160	0.362	0.045	0.408	0.633	0.572
12-May-03			0.086	0.118	0.158	0.362	0.029	0.391	0.615	0.599
13-May-03										
14-May-03										
<b>Flow (mgd)</b>										
Average			0.095	0.163	0.148	0.406	0.074	0.481	0.751	0.678
Max. Day			0.147	0.274	0.216	0.538	0.180	0.718	1.091	0.826
Peak Instant.			0.241	0.375	0.470		0.258			
<b>Peak Factors</b>										
Max. Day			1.54	1.68	1.46	1.32	2.42	1.49	1.45	1.22
Peak Instant.			2.52	2.30	3.18		3.46			
<b>Unit Flow</b>										
Units (EDU)		130	121	396	599	1,116	139	1,255	1,227	
(gpd/EDU)			789	412	247	364	536	383	612	

**TABLE 4-1**  
**SUMMARY OF METERED FLOWS**  
**LOWER (E.N.P.W.J.S.A.) SEWER DISTRICT - STONY CREEK BASIN**

Date	Precip. (inches)	Avg. Daily Flow (mgd)							T-200
		Stony Creek Interceptor @ MontCo CC	Rte 202 sewer, N of Rte 73	behind Center Sq. shop on E of Rte 202	Rte 73 sewer W of Rte 202	Rte 73 sewer, E of Rte 202 in Reed's lot	Fairview Ave sewer, W of Rte 202	Stony Creek Interceptor @ Rte 73	
		T-301	T-302	T-303	T-304	T-201	T-202	Subtotal	
13-Mar-03	0.10								
14-Mar-03		0.076	0.064	0.073	0.070	0.058	0.024	0.365	0.420
15-Mar-03		0.092	0.057	0.079	0.066	0.037	0.026	0.358	0.400
16-Mar-03		0.103	0.063		0.066	0.034	0.027		0.326
17-Mar-03		0.087	0.062		0.066	0.030	0.015		0.306
18-Mar-03		0.071	0.063		0.065	0.039	0.014		0.322
19-Mar-03	0.30	0.079	0.059	0.042	0.060	0.035	0.011	0.287	0.294
20-Mar-03	1.15	0.121	0.051	0.057	0.073	0.089	0.009	0.401	0.324
21-Mar-03	0.10	0.075	0.032	0.069	0.060	0.132	0.006	0.373	0.728
22-Mar-03		0.092	0.032	0.063	0.069	0.083	0.011	0.350	0.550
23-Mar-03		0.096	0.028	0.040	0.072	0.068	0.026	0.331	0.483
24-Mar-03		0.073	0.030	0.046	0.066	0.043	0.020	0.278	0.412
25-Mar-03		0.073	0.033	0.046	0.060	0.033	0.016	0.262	0.339
26-Mar-03	0.40	0.074	0.036	0.054	0.068	0.019	0.012	0.264	0.335
27-Mar-03		0.079	0.028	0.053	0.064	0.012	0.014	0.250	0.325
28-Mar-03		0.082	0.028	0.054	0.067	0.010	0.014	0.255	0.324
29-Mar-03	0.30	0.081	0.035	0.054	0.073	0.008	0.014	0.265	0.333
30-Mar-03	0.27	0.086	0.046	0.056	0.078	0.006	0.005	0.276	0.355
31-Mar-03		0.094	0.038	0.066	0.074	0.027	0.007	0.307	0.309
1-Apr-03	0.25	0.095	0.037	0.076	0.068	0.014	0.013	0.302	0.302
2-Apr-03		0.115	0.033	0.079	0.071	0.009	0.017	0.326	0.302
3-Apr-03		0.076	0.035	0.077	0.067	0.008	0.015	0.277	0.280
4-Apr-03		0.082	0.040	0.073	0.066	0.006	0.014	0.282	0.232
5-Apr-03	0.10	0.086	0.054	0.071	0.074	0.009	0.011	0.306	0.287
6-Apr-03		0.093	0.044	0.068	0.079	0.007	0.015	0.306	0.272
7-Apr-03	0.60	0.084	0.067	0.065	0.078	0.011	0.013	0.317	0.258
8-Apr-03	0.26	0.078	0.047	0.066	0.086	0.016	0.011	0.304	0.290
9-Apr-03	0.25	0.087	0.062	0.074	0.073	0.018	0.011	0.326	0.374
10-Apr-03	0.50	0.087	0.053	0.077	0.072	0.041	0.009	0.338	0.327
11-Apr-03	0.60	0.087	0.070	0.133	0.058	0.148	0.009	0.505	0.633
12-Apr-03		0.106	0.064	0.143	0.063	0.179	0.022	0.576	0.663
13-Apr-03		0.101	0.036	0.106	0.074	0.113	0.026	0.456	0.413
14-Apr-03		0.096	0.035	0.099	0.071	0.168	0.026	0.494	0.334
15-Apr-03		0.116	0.045	0.126	0.067	0.185	0.021	0.561	0.411
16-Apr-03		0.075	0.042	0.124	0.061	0.213	0.022	0.536	0.527
17-Apr-03		0.082	0.038	0.088	0.056	0.176	0.013	0.454	0.421
18-Apr-03	0.15	0.097	0.036	0.088	0.060	0.110	0.021	0.412	0.413
19-Apr-03		0.091	0.039	0.093	0.074	0.094	0.034	0.426	0.411



**TABLE 4-1**  
**SUMMARY OF METERED FLOWS**  
**LOWER (E.N.P.W.J.S.A.) SEWER DISTRICT - STONY CREEK BASIN**

Date	Precip. (inches)	Avg. Daily Flow (mgd)							T-200
		Stony Creek Interceptor @ Montco CC	Rte 202 sewer, N of Rte 73	behind Center Sq. shop ctn. E of Rte 202	Rte 73 sewer, W of Rte 202	Rte 73 sewer, E of Rte 202 in Reed's lot	Fairview Ave sewer, W of Rte 202	Stony Creek Interceptor @ Rte 73	
		T-301	T-302	T-303	T-304	T-201	T-202	Subtotal	
20-Apr-03	0.15	0.075	0.035	0.106	0.074	0.108	0.024	0.422	0.435
21-Apr-03		0.066	0.042	0.119	0.076	0.059	0.015	0.377	0.433
22-Apr-03		0.086	0.040	0.106	0.065	0.072	0.013	0.381	0.380
23-Apr-03		0.083	0.039	0.073	0.070	0.044	0.016	0.325	0.351
24-Apr-03	0.35	0.077	0.041	0.075	0.076	0.082	0.020	0.370	0.338
25-Apr-03		0.082	0.037	0.095	0.073	0.131	0.014	0.433	0.317
26-Apr-03		0.087	0.035	0.111	0.081	0.047	0.014	0.375	0.387
27-Apr-03		0.065	0.038	0.106	0.084	0.036	0.027	0.356	0.307
28-Apr-03	0.05	0.065	0.042	0.102	0.076	0.023	0.023	0.331	0.317
29-Apr-03		0.079	0.040	0.104	0.076	0.024	0.020	0.343	0.328
30-Apr-03		0.077	0.042	0.086	0.078	0.024	0.022	0.329	0.328
1-May-03		0.078	0.041	0.075	0.081	0.023	0.018	0.315	0.330
2-May-03	NA	0.095	0.042	0.076	0.082	0.028	0.025	0.348	0.343
3-May-03		0.078	0.039	0.069	0.084	0.021	0.028	0.318	0.337
4-May-03		0.081	0.038	0.066	0.096	0.024	0.025	0.329	0.312
5-May-03		0.090	0.036	0.067	0.091	0.015	0.012	0.310	0.305
6-May-03		0.092	0.035	0.066	0.086	0.018	0.013	0.310	0.305
7-May-03		0.075	0.036	0.063	0.093	0.024	0.009	0.300	0.297
8-May-03		0.091	0.038	0.063	0.099	0.022	0.010	0.325	0.315
9-May-03		0.107	0.035	0.057	0.090	0.021	0.014	0.324	0.314
10-May-03		0.073	0.035	0.060	0.099	0.012	0.017	0.298	0.318
11-May-03		0.057	0.038	0.072	0.101	0.019	0.017	0.304	0.330
12-May-03		0.070	0.038	0.059	0.095	0.025	0.021	0.309	0.304
13-May-03									
14-May-03									
<b>Flow (mgd)</b>									
Average		0.085	0.042	0.078	0.074	0.053	0.017	0.350	0.363
Max. Day		0.121	0.070	0.143	0.101	0.213	0.034	0.576	0.728
Peak Instant.		0.314	0.279	0.210	0.163	0.432	0.128		1.296
<b>Peak Factors</b>									
Max. Day		1.43	1.65	1.82	1.36	4.01	2.04	1.65	2.01
Peak Instant.		3.70	6.57	2.69	2.20	8.13	7.56		3.57
<b>Unit Flow</b>									
Units (EDU)		134	373	250	125	142	30	912	1,493
(gpd/EDU)		635	114	313	595	374	563	384	243

**TABLE 4-1**  
**SUMMARY OF METERED FLOWS**  
**LOWER (E.N.P.W.J.S.A.) SEWER DISTRICT - STONY CREEK BASIN**

Date	Precip. (inches)	Avg. Daily Flow (mgd)								op. time	Total PS (= T-200 + $\Sigma$ T-100s)	PS meter
		Yost Rd sewer, E of Interceptor T-101	Pulaski Dr sewer, W of Interceptor T-102	Clearview Ave sewer, at Thayer Dr T-104	No. Wales Rd Interceptor T-105	Twp. Line Rd sewer @ PS T-106	downstream connections to Interceptor	N. Wales Rd Pump. Sta.	Twp. Line Rd PS (= T-200 + $\Sigma$ T-100s)			
13-Mar-03	0.10	0.120	0.100	0.104	0.112	0.133	0.569					1.549
14-Mar-03		0.108	0.086	0.098	0.109	0.133	0.534		0.954			1.577
15-Mar-03		0.140	0.093	0.076	0.106	0.129	0.544		0.944			1.511
16-Mar-03		0.151	0.100	0.074	0.094	0.132	0.553		0.879			1.467
17-Mar-03		0.134	0.088	0.068	0.077	0.127	0.494		0.800			1.446
18-Mar-03		0.122	0.108	0.061	0.090	0.121	0.503		0.825			1.362
19-Mar-03	0.30	0.125	0.108	0.058	0.106	0.136	0.534		0.828			1.294
20-Mar-03	1.15	0.175	0.099	0.073	0.128	0.162	0.637		0.961			2.292
21-Mar-03	0.10	0.163	0.102	0.082	0.097	0.177	0.621		1.349			2.093
22-Mar-03		0.161	0.075	0.076	0.083	0.147	0.542		1.093			1.744
23-Mar-03		0.162	0.045	0.072	0.115	0.154	0.548		1.031			1.642
24-Mar-03		0.156	0.057	0.065	0.071	0.148	0.497		0.909			1.462
25-Mar-03		0.152	0.073	0.061	0.090	0.139	0.516		0.855			1.377
26-Mar-03	0.40	0.145	0.114	0.060	0.081	0.145	0.545		0.880			1.403
27-Mar-03		0.142	0.126	0.060	0.122	0.145	0.595		0.919			1.323
28-Mar-03		0.137	0.154	0.059		0.135						1.324
29-Mar-03	0.30	0.147	0.139	0.064		0.145						1.317
30-Mar-03	0.27	0.146	0.147	0.066		0.150						1.425
31-Mar-03		0.153	0.124	0.052	0.089	0.135	0.552		0.861			1.321
1-Apr-03	0.25	0.147	0.091	0.041	0.073	0.123	0.475		0.777			1.295
2-Apr-03		0.151	0.096	0.041	0.075	0.114	0.477		0.778			1.248
3-Apr-03		0.155	0.086	0.038	0.072	0.109	0.460		0.740			1.216
4-Apr-03		0.158	0.074	0.051	0.073	0.106	0.462		0.694			1.306
5-Apr-03	0.10	0.185	0.065	0.049	0.070	0.115	0.483		0.770			1.058
6-Apr-03		0.191	0.095	0.048	0.067	0.117	0.517		0.788			1.159
7-Apr-03	0.60	0.170	0.074	0.051	0.066	0.115	0.476		0.734			1.160
8-Apr-03	0.26	0.157	0.090	0.045	0.070	0.107	0.470		0.760			1.291
9-Apr-03	0.25	0.173	0.096	0.046	0.071	0.122	0.507		0.881			1.450
10-Apr-03	0.50	0.135	0.086	0.043	0.067	0.110	0.440		0.767			1.377
11-Apr-03	0.60	0.165	0.107	0.036	0.068	0.139	0.515		1.148			2.038
12-Apr-03		0.160	0.118	0.052	0.075	0.147	0.551		1.215			1.832
13-Apr-03		0.211	0.115	0.049	0.100	0.135	0.610		1.023			1.480
14-Apr-03		0.213	0.238	0.048	0.084	0.132	0.714		1.048			1.429
15-Apr-03		0.187	0.249	0.035	0.073	0.133	0.676		1.088			1.531
16-Apr-03		0.189	0.191	0.044	0.073	0.133	0.629		1.156			1.323
17-Apr-03		0.173	0.301	0.035	0.071	0.120	0.700		1.121			1.145
18-Apr-03	0.15	0.168	0.261	0.033	0.071	0.123	0.656		1.069			1.166
19-Apr-03		0.177	0.274	0.037	0.072	0.129	0.688		1.099			1.208


**TABLE 4-1**  
**SUMMARY OF METERED FLOWS**  
**LOWER (E.N.P.W.J.S.A.) SEWER DISTRICT - STONY CREEK BASIN**

Date	Precip. (inches)	Avg. Daily Flow (mgd)							
		Yost Rd sewer, E of interceptor	Pulaski Dr sewer, W of interceptor	Clearview Ave sewer, at Thayer Dr	No. Wales Rd interceptor	Twp. Line Rd sewer @ PS	downstream connections to Interceptor	N. Wales Rd Pump, Sta.	Twp. Line Rd PS (= T-200 + $\Sigma$ T-100s)
		T-101	T-102	T-104	T-105	T-106	Subtotal	op. time	Total PS meter
20-Apr-03	0.15	0.169	0.265	0.031	0.068	0.130	0.662		1.097
21-Apr-03		0.166	0.250	0.028	0.066	0.116	0.627		1.059
22-Apr-03		0.173	0.235	0.040	0.068	0.110	0.625		1.006
23-Apr-03		0.175	0.217	0.041	0.071	0.094	0.598		0.949
24-Apr-03	0.35	0.156	0.199	0.042	0.066	0.089	0.552		0.890
25-Apr-03		0.157	0.204	0.039	0.069	0.088	0.556		0.873
26-Apr-03		0.179	0.258	0.051	0.074	0.095	0.657		1.045
27-Apr-03		0.166	0.251	0.048	0.100	0.093	0.658		0.965
28-Apr-03	0.05	0.140	0.222	0.048	0.084	0.079	0.573		0.890
29-Apr-03		0.142	0.282	0.034	0.080	0.076	0.613		0.941
30-Apr-03		0.122	0.268	0.027	0.073	0.081	0.571		0.899
1-May-03		0.113	0.234	0.029	0.058	0.088	0.522		0.852
2-May-03	NA	0.102	0.252	0.026	0.066	0.090	0.536		0.878
3-May-03		0.110	0.237	0.032	0.072	0.094	0.545		0.882
4-May-03		0.105	0.171	0.035	0.065	0.100	0.477		0.790
5-May-03		0.094	0.112	0.031	0.067	0.091	0.396		0.701
6-May-03		0.096	0.151	0.038	0.059	0.090	0.435		0.739
7-May-03		0.079	0.182	0.035	0.057	0.084	0.437		0.734
8-May-03		0.082	0.247	0.051	0.061	0.088	0.530		0.845
9-May-03		0.089	0.117	0.047	0.050	0.072	0.374		0.688
10-May-03		0.096	0.127	0.052	0.054	0.082	0.412		0.730
11-May-03		0.088	0.141	0.054	0.062	0.097	0.441		0.771
12-May-03		0.071	0.153	0.049	0.083	0.084	0.440		0.744
13-May-03									0.884
14-May-03									0.856
<b>Flow (mgd)</b>									
Average		0.145	0.154	0.050	0.078	0.117	0.544		0.907
Max. Day		0.213	0.301	0.104	0.128	0.177	0.714		1.349
Peak Instant.		0.389	0.883	0.183	0.654	0.293			2.292
<b>Peak Factors</b>									
Max. Day		1.46	1.95	2.06	1.64	1.51	1.31		1.49
Peak Instant.		2.68	5.72	3.65	8.37	2.51			1.82
<b>Unit Flow</b>									
Units (EDU)		119	149	154	742	288	1,452	648	2,945
(gpd/EDU)		1,226	1,034	326	105	406	374		308

**TABLE 4-1**  
**SUMMARY OF METERED FLOWS**  
**LOWER (E.N.P.W.J.S.A.) SEWER DISTRICT - MERMAID RUN BASIN**

Date      Precip. (inches)		Avg. Daily Flow (mgd)									
		Valley Rd sewer, E of Interceptor	Valley Rd sewer, N of Interceptor	Holstein Ct sewer, W of Interceptor	Jolly Rd sewer, W of Interceptor	Jolly Rd sewer, E of Interceptor	Mermaid Int, upstream of Jolly Rd	Mermaid Interceptor, below Jolly	Twp. Line Rd sewer @ PS	Mermaid Run Pump Sta.	Mermaid Run Pump Sta.
		M-301	M-302	M-112	M-113	M-201	Subtotal	M-400	M-114	Total	Sheffield
13-Mar-03	0.10										0.751
14-Mar-03		0.221	0.320	0.030	0.023	0.064	0.658	1.077	0.013	1.090	0.733
15-Mar-03		0.226	0.326	0.023	0.021	0.043	0.640	1.050	0.012	1.062	0.677
16-Mar-03		0.243	0.334	0.028	0.019	0.035	0.659	1.076	0.028	1.104	0.660
17-Mar-03		0.260	0.319	0.033	0.019	0.041	0.672	1.118	0.052	1.170	0.701
18-Mar-03		0.202	0.319	0.024	0.016	0.058	0.618	1.107	0.028	1.135	0.713
19-Mar-03	0.30	0.126	0.314	0.023	0.022	0.075	0.560	1.030	0.027	1.056	0.680
20-Mar-03	1.15	0.192	0.409	0.023	0.034	0.087	0.746	1.871	0.034	1.905	0.946
21-Mar-03	0.10	0.294	0.445	0.028	0.022	0.050	0.840	2.184	0.053	2.238	0.980
22-Mar-03		0.220	0.374	0.029	0.019	0.050	0.693	1.439	0.027	1.466	0.723
23-Mar-03		0.187	0.329	0.030	0.019	0.047	0.612	1.146	0.031	1.176	0.699
24-Mar-03		0.169	0.305	0.032	0.021	0.048	0.575	1.114	0.035	1.149	0.722
25-Mar-03		0.147	0.362	0.028	0.023	0.062	0.622	1.068	0.043	1.110	0.684
26-Mar-03	0.40	0.140	0.361	0.028	0.021	0.057	0.607	1.116	0.028	1.144	0.681
27-Mar-03		0.125	0.378	0.026	0.019	0.071	0.620	1.044	0.034	1.079	0.650
28-Mar-03		0.118	0.389	0.027	0.019	0.087	0.639	1.048	0.047	1.095	0.649
29-Mar-03	0.30	0.117	0.387	0.027	0.025	0.071	0.628	1.114	0.059	1.173	0.583
30-Mar-03	0.27	0.120	0.381	0.025	0.021	0.062	0.609	1.158	0.050	1.208	0.626
31-Mar-03		0.103	0.361	0.027	0.019	0.048	0.559	1.070	0.026	1.097	0.623
1-Apr-03	0.25	0.097	0.377	0.021	0.021	0.058	0.575	1.065	0.035	1.100	0.613
2-Apr-03		0.135	0.372	0.018	0.024	0.064	0.613	1.047	0.042	1.090	0.615
3-Apr-03		0.146	0.381	0.023	0.023	0.072	0.645	1.051	0.041	1.092	0.592
4-Apr-03		0.133	0.354	0.029	0.021	0.064	0.602	1.066	0.018	1.084	0.540
5-Apr-03	0.10	0.135	0.330	0.027	0.019	0.088	0.598	1.054	0.020	1.074	0.540
6-Apr-03		0.129	0.297	0.028	0.019	0.071	0.544	1.040	0.010	1.050	0.558
7-Apr-03	0.60	0.134	0.286	0.030	0.021	0.062	0.533	1.045	0.005	1.050	0.558
8-Apr-03	0.26	0.131	0.287	0.028	0.023	0.049	0.518	1.082	0.006	1.088	0.598
9-Apr-03	0.25	0.178	0.298	0.024	0.021	0.064	0.585	1.114	0.007	1.121	0.643
10-Apr-03	0.50	0.169	0.295	0.028	0.019	0.072	0.583	1.072	0.006	1.077	0.636
11-Apr-03	0.60	0.260	0.345	0.027	0.025	0.059	0.717	1.115	0.016	1.131	0.809
12-Apr-03		0.328	0.366	0.027	0.022	0.064	0.807	1.053	0.020	1.072	0.750
13-Apr-03		0.303	0.320	0.036	0.023	0.068	0.750	1.049	0.018	1.068	0.662
14-Apr-03		0.298	0.296	0.033	0.021	0.062	0.711	1.064	0.014	1.078	0.707
15-Apr-03		0.306	0.300	0.027	0.019	0.049	0.700	1.044	0.010	1.054	0.742
16-Apr-03		0.294	0.284	0.026	0.019	0.064	0.687	1.040	0.009	1.049	0.645
17-Apr-03		0.272	0.251	0.021	0.019	0.055	0.616	1.051	0.009	1.060	0.577
18-Apr-03	0.15	0.244	0.227	0.028	0.026	0.061	0.585	1.046	0.008	1.054	0.589
19-Apr-03		0.248	0.226	0.031	0.022	0.065	0.591	1.014	0.008	1.023	0.562

**TABLE 4-1**  
**SUMMARY OF METERED FLOWS**  
**LOWER (E.N.P.W.J.S.A.) SEWER DISTRICT - MERMAID RUN BASIN**

		Avg. Daily Flow (mgd)									
		Valley Rd sewer, E of interceptor	Valley Rd sewer, N of interceptor	Holstein Ct sewer, W of interceptor	Jolly Rd sewer, W of interceptor	Jolly Rd sewer, E of interceptor	Mermaid Int. upstream of Jolly Rd	Mermaid interceptor, below Jolly	Twp. Line Rd sewer @ PS	Mermaid Run Pump Sta.	Mermaid Run Pump Sta.
Date	Precip. (inches)	M-301	M-302	M-112	M-113	M-201	Subtotal	M-400	M-114	Total	Sheff'd
20-Apr-03	0.15	0.249	0.199	0.030	0.022	0.060	0.560	0.982	0.008	0.991	0.616
21-Apr-03		0.247	0.167	0.029	0.017	0.082	0.543	1.046	0.010	1.055	0.476
22-Apr-03		0.225	0.145	0.025	0.015	0.066	0.477	1.010	0.008	1.018	0.581
23-Apr-03		0.215	0.126	0.025	0.020	0.057	0.444	1.013	0.009	1.022	0.502
24-Apr-03		0.207	0.112	0.025	0.019	0.045	0.407	1.040	0.010	1.050	0.535
25-Apr-03	0.35	0.189	0.121	0.024	0.017	0.059	0.411	1.042	0.010	1.051	0.500
26-Apr-03	0.25	0.205	0.118	0.032	0.020	0.068	0.442	1.030	0.011	1.041	0.497
27-Apr-03	0.05 NA 	0.196	0.125	0.030	0.019	0.055	0.424	1.022	0.008	1.030	0.471
28-Apr-03		0.194	0.154	0.021	0.021	0.054	0.445	1.083	0.006	1.089	0.492
29-Apr-03		0.192	0.164	0.020	0.018	0.061	0.456	1.087	0.006	1.092	0.480
30-Apr-03		0.181	0.155	0.019	0.020	0.067	0.442	1.048	0.006	1.053	0.460
1-May-03		0.174	0.157	0.017	0.021	0.059	0.428	1.089	0.005	1.094	0.457
2-May-03		0.175	0.159	0.014	0.022	0.086	0.455	1.059	0.007	1.065	0.441
3-May-03		0.165	0.150	0.029	0.020	0.068	0.433	1.062	0.005	1.067	0.394
4-May-03		0.163	0.138	0.027	0.014	0.059	0.401	1.086	0.005	1.091	0.396
5-May-03		0.151	0.138	0.040	0.021	0.046	0.395	1.053	0.005	1.058	0.465
6-May-03		0.147	0.128	0.040	0.015	0.061	0.392	1.094	0.005	1.099	0.399
7-May-03		0.152	0.123	0.033	0.017	0.068	0.393	1.139	0.006	1.145	0.457
8-May-03		0.162	0.132	0.038	0.026	0.057	0.415	1.123	0.006	1.129	0.440
9-May-03		0.146	0.128	0.037	0.021	0.036	0.369	1.098	0.005	1.103	0.431
10-May-03		0.140	0.123	0.029	0.017	0.051	0.359	1.056	0.006	1.063	0.389
11-May-03		0.158	0.123	0.024	0.019	0.053	0.377	0.969	0.007	0.975	0.401
12-May-03		0.156	0.117	0.020	0.019	0.060	0.371	0.999	0.007	1.005	0.418
13-May-03											0.403
14-May-03											0.397
Flow (mgd)											
Average		0.189	0.258	0.027	0.021	0.061	0.556	1.103	0.018	1.121	0.586
Max. Day		0.328	0.445	0.040	0.034	0.088	0.840	2.184	0.059	2.238	0.980
Peak Instant.		0.379	0.637	0.107	0.067	0.280		3.112	0.477		
Peak Factors											
Max. Day		1.73	1.72	1.48	1.68	1.44	1.51	1.98	3.25	2.00	1.67
Peak Instant.		2.01	2.47	3.94	3.25	4.60		2.82	26.27		
Unit Flow											
Units (EDU)		185	252	163	216	222	1,038	1,105	342	1,566	1,607
(gpd/EDU)		1,022	1,025	167	95	274	536	998	53	716	365



**2005 ACT 537 PLAN UPDATE  
FOR  
PLYMOUTH TOWNSHIP, MONTGOMERY COUNTY,  
PENNSYLVANIA**

**JULY 2005**

**Prepared By:**



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**2005 ACT 537 PLAN UPDATE  
FOR  
PLYMOUTH TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA**

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12	Proposed Development	58

## EXECUTIVE SUMMARY

In accordance with the Pennsylvania Sewage Facilities Act, municipalities are required to prepare, adopt and follow an official sewage facilities plan. Plymouth Township, in southern Montgomery County, adopted its current "Sewage Facilities Act 537 Plan" in 1992.

One of the wastewater treatment plants (WWTPs) which serves Plymouth Township is the East Norriton-Plymouth-Whitpain Joint Sewer Authority (ENPWJSA) WWTP. ENPWJSA is currently examining the possibility of getting this WWTP rerated to a higher capacity. However, before the Pennsylvania Department of Environmental Protection (PADEP) will approve a rerating, an Act 537 Plan amendment is required. Plymouth Township is included in the ENPWJSA sewer service area and is required to amend their Act 537 Plan.

Wastewater generated in the southern section of the Township is conveyed to the Conshohocken Wastewater Treatment Plant. A small portion of the Township's wastewater is treated at the Whitemarsh Township Wastewater Treatment Plant and a small portion is treated at the Norristown Wastewater Treatment Plant. The collection and conveyance system of Plymouth Township contains approximately 318,530 feet of gravity sanitary sewers and six pumping stations.

A capacity analysis was conducted on the existing sanitary sewer system to determine existing and future potential problem areas. These areas have been identified in the report and will be monitored to determine if a theoretical capacity analysis confirms the need to increase the size of the interceptor systems. At the present time, there are no known overflows occurring.

There are approximately 220 on-lot disposal systems in Plymouth Township. Currently, there are no complaints of failing septic systems in the Township.

Plymouth Township has an allocated capacity at the East Norriton/Plymouth/Whitpain Joint Sewer Authority of 11,273 equivalent dwelling units. Currently, 9,822 (March 2005) of these are connected leaving 1,451 available EDU's for future construction. Plymouth Township estimates that they will need 1643 additional EDU's in the East Norriton/Plymouth/Whitpain Joint Sewer Authority Watershed to serve the ultimate potential growth. Plymouth Township is requesting a minimum of an additional 1.5 million gallons per day in the rerated wastewater treatment plant. Without this, future growth in the Township can not take place.

Plymouth Township has determined that the continued use of the conventional, collection, conveyance and treatment of its wastewater is the most appropriate alternative to serve the needs of the residents and businesses of the Township. Other alternatives are not appropriate since Plymouth Township is almost fully developed and has committed to this alternative for over 50 years.

No specific sewer projects are proposed by this Act 537 revision. Extensions of the collection system will be done by developers or as needs occur should on-site disposal systems become a problem and the resident's request service by Plymouth Township. Upgrades to the carrying capacity of the collection and conveyance systems is done on an as needed basis and as needed basis with funding coming from sewer revenues. Plymouth Township does not need any additional capacity at the Conshohocken Borough Authority Wastewater Treatment Plant in the foreseeable future.

## **INTRODUCTION**

In accordance with the Pennsylvania Sewage Facilities Act, which was enacted on January 24, 1966, municipalities are required to prepare, adopt and follow an official sewage facilities plan. Since the 1970's, through 1992, Plymouth Township, in southern Montgomery County, used the "Sewage Facilities Plan, Montgomery County, Pennsylvania, last revised in 1978, by the Montgomery County Planning Commission, as their "Official Plan" also termed "Act 537 Plan". This Act 537 Plan is a county-wide plan and includes about 60 municipalities which individually adopted this plan. Plymouth Township adopted an updated individual Act 537 Plan in June 1992.

Plymouth Township does not own or operate a wastewater treatment plant (WWTP). Treatment for the majority of the Township is provided by the East Norriton-Plymouth-Whitpain Joint Sewer Authority (ENPWJSA) or the Conshohocken Borough Authority (CBA). A small portion of the Township's wastewater is treated at the Whitemarsh Township Wastewater Treatment Plant (WTWTP). A few customers drain to the Borough of Norristown (BON). The ENPWJSA Treatment Plant is currently being examined for the possibility of being rerated to a higher capacity. Before the Pennsylvania Department of Environmental Protection (PADEP) will approve a rerating, each of the connected Municipalities have been requested to prepare an updated Act 537 Plan. Although the entire Township will be included in this plan update. The main purpose of this Act 537 update is to provide data to the PADEP in support of the ENPWJSA's request for rerating.

This report is being prepared in accordance with the guidelines established by Act 537 for the preparation of an Act 537 Plan. It will not include information concerning the wastewater treatment plants since this information is available and being provided by other authorities. Exhibit #1 is a location map of Plymouth Township.

### **I. PREVIOUS WASTEWATER PLANNING**

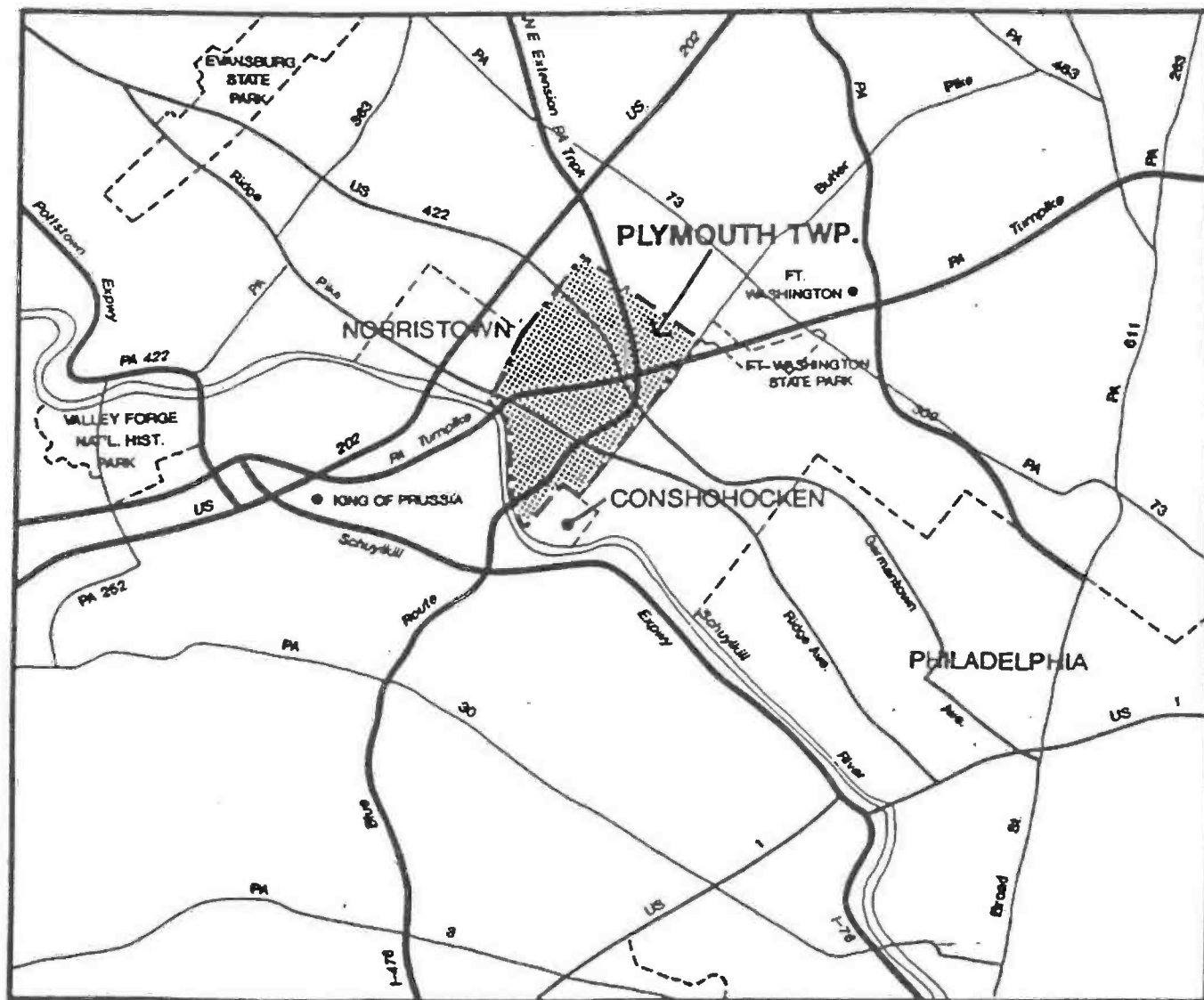
#### **A. Identify All Existing Wastewater Planning**

The following is a list of existing water quality management plans, which were prepared for and adopted by Plymouth Township:

1. Montgomery County Sewer Facilities Plan (Act 537 Plan), prepared by Montgomery County Planning Commission, dated 1971, last revised 1978.
2. 1992 Act 537 Plan update, prepared for Plymouth Township, dated June 1992, last revised May 1993, prepared by Acer Engineers & Consultants, Inc.
3. East Norriton/Plymouth/Whitpain Joint Sewer Authority, Chapter 94, Municipal Waste Load Management Report for 2002, dated March 25, 2005, prepared by Arro Consulting, Inc.
4. 2002 Municipal Waste Load Management Report for the Borough of Conshohocken Authority, dated March 2005, prepared by Remington, Vernick, and Beach Engineers.

**Figure 1.1**

*Location of Plymouth  
Township*



Municipal and County Planning Documents

1. Plymouth Township Comprehensive Plans and Zoning Maps

Plymouth Township completed an update of its Comprehensive Plan in 1990. This 1990 Plymouth Township Comprehensive Plan update was prepared by Norman Day Associates and was adopted by Plymouth Township Council on October 8, 1990. This document will serve as the basis for this Act 537 update. Plymouth Township is in the process of updating the Comprehensive Plan. However, the Comprehensive Plan update will not be adopted prior to the adoption of the 537 Plan Amendment. Exhibit #2 is a copy of the 1990 Plymouth Township Comprehensive Plan's, Land Use Map.

The Montgomery County Planning Commission is in the process of preparing a Comprehensive Plan for Montgomery County. The September 2002 report titled "Vision Plan Shaping Our Future" is included by reference and Exhibit #3 is a copy of the DRAFT "Growth and Preservation Plan" for Plymouth Township.

The official Zoning Map of Plymouth Township was originally adopted on March 14, 1960 as part of Ordinance #342. Since that time, the Zoning Map has been periodically updated to its current version. Exhibit #4 is a copy of the Plymouth Township Zoning Map. This Zoning Map is dated December 9, 2004.

2. Zoning and Subdivision Regulations

The original Zoning Ordinance of Plymouth Township, identified as Ordinance #342, was adopted by the Plymouth Township Council on March 14, 1960. The current ordinance is dated March 2005. This ordinance is included by reference. The Zoning Ordinance of Plymouth Township establishes 22 separate districts within the boundaries of Plymouth Township. This ordinance controls the uses, heights of buildings, lot areas, yard setbacks, building coverages and impervious surfaces throughout the Township.

The current Subdivision and Land Development Regulations are known as the Plymouth Township Subdivision and Land Development Ordinance of 1980. This ordinance #837 was adopted September 8, 1980. The current ordinance is dated September 2004. This ordinance is included by reference.

Section 513 of the Plymouth Township Subdivision and Land Development Code provides the standards for sanitary sewers and onsite disposals. This section is as follows:

Section 513. Sanitary sewers and on-site disposals.

1. *Sewers.* Wherever practicable, sanitary sewers shall be installed and connected to the township sanitary sewer system. In areas not presently served by public sanitary sewers, the township shall require, in addition to installation of individual on-site sewage disposal facilities, the installation of capping of sanitary sewer mains and house connection, if studies by council

# PLYMOUTH TOWNSHIP

Montgomery County PA.

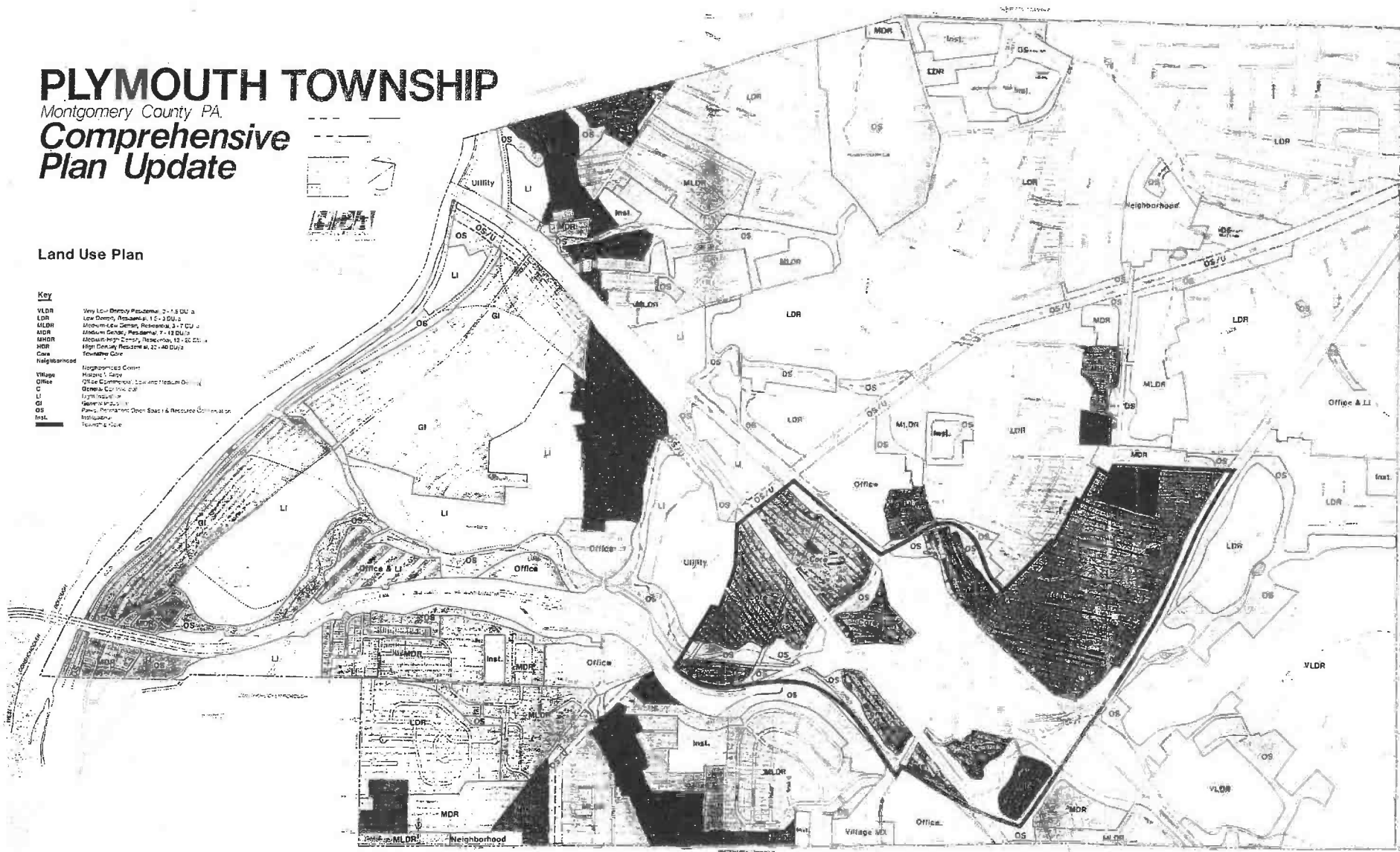
## Comprehensive Plan Update



### Land Use Plan

#### Key

VLDL	Very Low Density Residential, 2 - 3 DU/a
LDR	Low Density Residential, 10 - 20 DU/a
MLDR	Medium Low Density Residential, 3 - 7 DU/a
MDR	Medium Density Residential, 7 - 12 DU/a
MDR	Medium High Density Residential, 12 - 20 DU/a
MDR	High Density Residential, 20 - 40 DU/a
Office	Office
Neighborhood	Neighborhood
Village	Village
Office	Office
C	Community Center
LI	Light Industrial
GI	General Industrial
OS	Office, Professional, Open Space & Resource Conservation
Inst.	Institutional
Inst.	Institutional
Inst.	Institutional



Land Use Plan

EXHIBIT #2



# Growth and Preservation Plan

from Vision Plan: Shaping Our Future - A Comprehensive Plan for Montgomery County

Plymouth Township, Montgomery County, PA



Note: All features are based on 2000 information, including existing development and preserved open space. Descriptions of the categories are contained on page 30 of the Vision Plan draft.

## GROWTH AND PRESERVATION CATEGORIES

Existing Suburban Development

Existing Rural Development

Designated Growth Areas

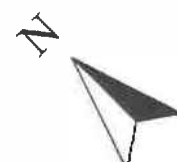
Existing Preserved Open Space

Existing Preserved Farmland

Proposed Open Space

Rural Resource Areas

DRAFT



## 2005 PLYMOUTH TOWNSHIP ACT 537 UPDATE

indicate that the extension of public sanitary sewer trunks or lateral to serve the property subdivided appears probable or necessary to protect public health.

- A. When a feasibility analysis, conducted by the township engineer, municipal authority, and district sanitarian has ascertained that sanitary sewers are practicable, then sanitary sewers, with connection to each building in a subdivision or land development, shall be installed at the expense of the developer, and connected to the township sanitary sewer system.
- B. If outfall sewers are not available in the vicinity, but are considered reasonably necessary in the near future by the township or Pennsylvania Department of Environmental Resources or other appropriate state or county agency for the area in question, a system of sewers, together with all necessary laterals extending from mains to the street right-of-way line shall be installed at the expense of the developer. The sewer lines shall be suitable capped at the limits of the subdivision or land development and the laterals shall be capped at the right-of-way. The sewer installations shall include the construction within rights-of-way or easement to bring the sewer to the future connection with the township sanitary sewer system.
- C. If sanitary sewers are not to be installed at the time of subdivision and development, subdividers shall grant, reserve, and set aside easements in streets and roads for installation and maintenance of sewer lines at such time that the subdivision or land development shall be a part of the township sanitary sewer system.
- D. A sewer shall be considered to be planned for extension to a given area any time after preliminary engineering and related studies have been completed and the construction of facilities adequate to serve the area containing the subdivision has been programmed for completion within a reasonable time.
- E. All public sewers shall be constructed in accordance with the Plymouth Township "Standard Specification for the Construction of Sanitary Sewers and Appurtenances," as amended.
- F. No public sewer system or treatment plant shall be constructed until plans and specifications have been submitted to the department of environmental resources and the township engineer and approved for construction.
- G. Size and grade. Sanitary sewers shall have a minimum inside diameter of eight (8) inches and a minimum grade of 0.5 per cent (1/2 of 1%)
- H. Manholes. Manholes shall be located at intervals of two hundred fifty (250) feet and at each change of line or grade. In exceptional cases, the interval may be extended to not more than three hundred (300) feet. Manhole covers and frame in the cartway shall include a "Preko" adjustable manhole frame (Neenah Foundry Company) or approved equal.

## 2005 PLYMOUTH TOWNSHIP ACT 537 UPDATE

- I. Laterals. Lateral connections to each lot shown on the final plan shall be installed to the right-of-way line of the street prior to paving. Each building shall have a separate connection to the township sewer.

### 2. *On-Lot Disposal System*

- A. If public sewer facilities are not available, the developer shall provide for sewage disposal on an individual lot basis.
- B. On-lot sewage disposal facilities must comply with the provisions of Chapters 71 and 73, Administration of Sewage Facilities Program and Standards for Sewage Disposal Facilities, Pennsylvania Sewage Facilities Act (Act of January 24, 1966), P.L. 1535, No. 537, as amended. Prior to signing the record plan by the township, the proposed facilities shall be deemed satisfactory by the Pennsylvania Department of Environmental Protection and a notation to this effect shall be placed on the record plan.
- C. The construction of on-lot systems shall be inspected by the Montgomery County Department of Health.
- D. Each owner or occupant of a dwelling unit with on lot facilities shall retain a plan of the system and an instruction manual for the use and proper maintenance of the system by the developer.

### 3. Floodplain Limitations

Article XVII of the Plymouth Township Zoning Ordinance establishes the locations of floodplains, the uses permitted in a floodplain conservation district, the uses permitted by special exception, and the procedures required to obtain approval of uses by special exception. Exhibit #5 is a copy of the Plymouth Township Floodplain Map. The floodplains shown on this map were established based upon alluvial soils published by the US Department of Agriculture, Soil Conservation Service and the National Flood Insurance Program prepared by the Federal Emergency Management Agency, dated December 19, 1996. Also included is a detail study prepared by the Army Corps of Engineers for the Branch of the Sawmill Run crossing through the Township. The map and the Zoning Ordinance are included in this Act 537 Report by reference.

### Stormwater Management

The Subdivision and Land Development Ordinance of Plymouth Township contains the stormwater management criteria to be used for any subdivision or land development. Section 510 contains criteria and design standards for stormwater retention. The current criteria used in the Township for development requires stormwater retainage to provide for a 100 year storm emergency spillway. The detention basin must be designed to control the 50 year post development runoff to a 10 year predevelopment condition. Also during a 10 year post development storm, the maximum discharge is a 2 year predevelopment condition. The following is a portion of the Subdivision and Land Development Ordinance dealing with stormwater management:

## 2005 PLYMOUTH TOWNSHIP ACT 537 UPDATE

### 9. Stormwater retention:

A. Stormwater retention facilities will be required if one of the following conditions are met:

- (1) Runoff from the development would exceed the capacity of downstream stormwater facilities;
- (2) Runoff from the development would increase the peak runoff from the existing conditions. One single- family dwelling not requiring subdivision is exempt from this requirement;
- (3) Runoff from a proposed parking facility or building would increase the peak runoff from the existing condition.

B. The design criteria for the stormwater retention facility shall be approved by the township engineer. Developers shall investigate all measures available to reduce and retain water runoff. Where appropriate, additional reviews shall be performed by the United States Department of Agriculture Soil Conservation Service and/or the Bureau of Dams and Encroachments of the Pennsylvania Department of Environmental Resources.

### 10. Design submission:

- A. All plans showing the proposed storm sewer construction must be accompanied by a complete design submitted by the registered engineer.
- B. When subdivisions or land developments are submitted to the township for approval in sections, a complete stormwater control design for the proposed subdivision and land development shall be submitted. The proposed design must include the entire tract and not a portion.
- C. If only a section of a subdivision or land development is contemplated for construction, the engineer shall show how he proposes to handle stormwater from this section in order to prevent damage to adjacent properties. If temporary construction is required, the engineer shall include such structures in the plan submitted.
- D. In the event such temporary measures cannot ensure protection to the adjacent properties, then the main outfall line of the storm sewer shall be included as part of the construction of the proposed section.

11. *Stony Creek/Sawmill Run Watershed Stormwater Management.* The design features for all lots located within the Stony Creek/Sawmill Run Watershed shall be in compliance with the Stony Creek/Sawmill Run Watershed Stormwater Management Ordinance, Ordinance No. 1101 of May 11, 1992, Appendix E to the Plymouth Township Code.

Section 11 of this ordinance references the Stony Creek/Sawmill Run Watershed Stormwater Management Plan. This plan was prepared in June 1991 by the Montgomery County Planning Commission and adopted by Plymouth Township Council on May 11, 1992. Ordinance #1101 is specific to that portion of Plymouth Township within the Stony

Creek and Saw Mill Run Watersheds. The location of a project within the Township controls the maximum amount of peak runoff permitted. Ordinance #1101 is included in this Act 537 Report by reference.

#### Municipal Separate Storm Sewer System(MS4)

As required by the Pennsylvania Department of Environmental Protection, Plymouth Township filed for a National Pollution Discharge Elimination System (NPDES Permit) for its Municipal separate storm sewer system (MS4). The application was deemed "Administratively Complete" by DEP on February 18, 2003. On January 15, 2004, DEP issued the NPDES Permit. Plymouth Township elected to use the protocol established by the Pennsylvania Department of Environmental Protection. Number 4 of the protocol requires construction site stormwater runoff control and Section 5 post construction stormwater management in new development and redevelopment. This will be an ongoing program monitored by the Pennsylvania Department of Environmental Protection.

### PHYSICAL AND DEMOGRAPHIC ANALYSIS

#### A. Planning Area

##### 1. Boundaries

- ) Exhibit #6 titled 2003 Act 537 Plan Update – Existing Sewage Facilities Plan, Drainage Areas and Sewer Plot Plan identifies the boundaries of Plymouth Township. Also shown on this map are the services areas to the East Norriton/Plymouth/Whitpain Joint Sewer Authority, the Borough of Conshohocken Authority, Norristown Borough and Whitemarsh Township. Also shown are subdrainage areas to the pumping stations throughout the Township.

#### B. Physical Characteristics/Hydrology

Physical characteristics such as streams, lakes, impoundments, and natural conveyance channels are shown on the "Hydrology Map" of the Comprehensive Plan Update, as shown on Exhibit 6. The Schuylkill River is the main water body in the Township. Other significant drainage streams include Plymouth Creek, Diamond Run and Sawmill Run. Several small ponds exist across the Township. Wetlands and flood plains are also illustrated on the "Hydrology Map" (Exhibit 7). The map illustrates wetland areas of the Township as delineated by the National Wetlands Inventory. However, additional wetland areas would likely be found if detailed field surveys were performed. The 100-year flood plain areas, as defined by the Federal Emergency Management Agency Flood Insurance program, for Plymouth Creek and its tributaries and runoff channels, Diamond Run, and Sawmill Run and its tributaries are also shown by the "Hydrology Map".

) Two streams drain most of the land in Plymouth Township – Plymouth Creek in the south and Sawmill Run in the north. Both of these streams discharge to the Schuylkill River – Plymouth Creek through Conshohocken Borough and Sawmill Run through East Norriton

# PLYMOUTH TOWNSHIP

Montgomery County PA

## Comprehensive Plan Update

### Hydrology

- 1 Flood Plain
- 2 Wetlands
- 3 Open Water
- 4 Hydric Soils

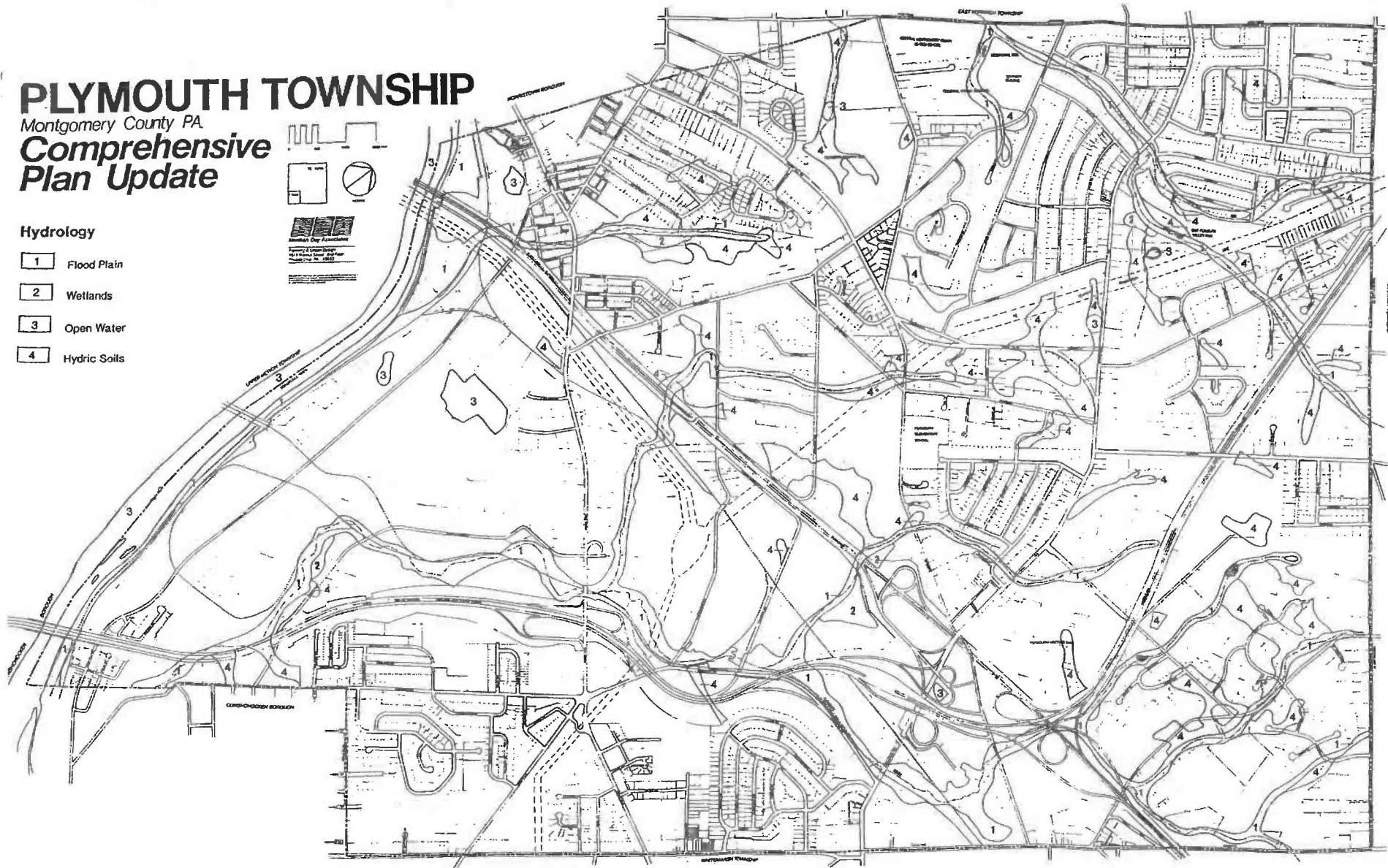
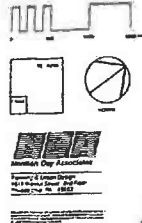


EXHIBIT #7

Hydrology

Township and Norristown Borough. A third stream, Diamond Run, drains the Black Horse and Mogeetown areas of the Township directly into the Schuylkill River.

For planning purposes, the Township has been divided into seven (7) major drainage areas, namely, Plymouth Creek, Sawmill Run, Diamond Run, Schuylkill River, Norristown, Stony Creek, and Whitemarsh. The Plymouth Creek drainage area can be further subdivided into five (5) minor drainage areas. They are designated primarily by the pump stations which pump wastewater (sewage) generated in these areas to the receiving wastewater plant. These drainage areas are named Turf Lane Pump Station, Chemical Road Pump Station, Plymouth Hunt Pump Station, and Narcissa Road Pump Station. The fifth minor drainage area is the Conshohocken drainage area, which is not associated with a pump station. The Norristown drainage area was also divided into three (3) minor drainage areas named Curren Terrace Pump Station, Plymouth Country Club, and Northview Boulevard.

There are no wastewater treatment facilities under the jurisdiction of Plymouth Township. Wastewater from Plymouth Township flows to four (4) plants which are under the jurisdiction of the East Norriton Plymouth Whitpain Joint Sewer Authority (ENPWJSA), Conshohocken Borough Authority, Whitemarsh Township and the Borough of Norristown.

C. Soils

According to the USDA Soil Conservation Service General Soil Map which is shown on Exhibit 8, the major classifications of soil found in Plymouth Township are as follows:

*Made land-Glenelg-Chester Association:* Deep moderately deep, well-drained soils underlain by chert and gneiss; on undulating uplands.

*Made land-Duffield-Lawrenceville Association:* Deep, well-drained soils underlain by limestone; on undulating uplands.

*Lansdale-Penn-Readington Association:* Deep and moderately deep, well drained and moderately well drained soils underlain by shale and sandstone; on rolling uplands.

*Manor-Glenelg-Made Land Association:* Moderately deep and deep, well-drained soils underlain by schist and gneiss; micaceous soils on hilly uplands

*Lawrenceville-Chalfont-Doylestown Association:* Deep, moderately well drained to poorly drained soils formed in windblown silt deposits; on undulating uplands.

*Rowland-Birdsboro-Raritan Association:* Deep, well-drained to somewhat poorly drained soils formed in old alluvial deposits; on flood plains and terraces.

The Comprehensive Plan Update "Hydrology Map" (Exhibit 7) specifically illustrates hydric soils, which generally have a seasonally high water table, as defined and mapped by the USDA Soil Conservation Service in their Montgomery County soil survey. These soils are

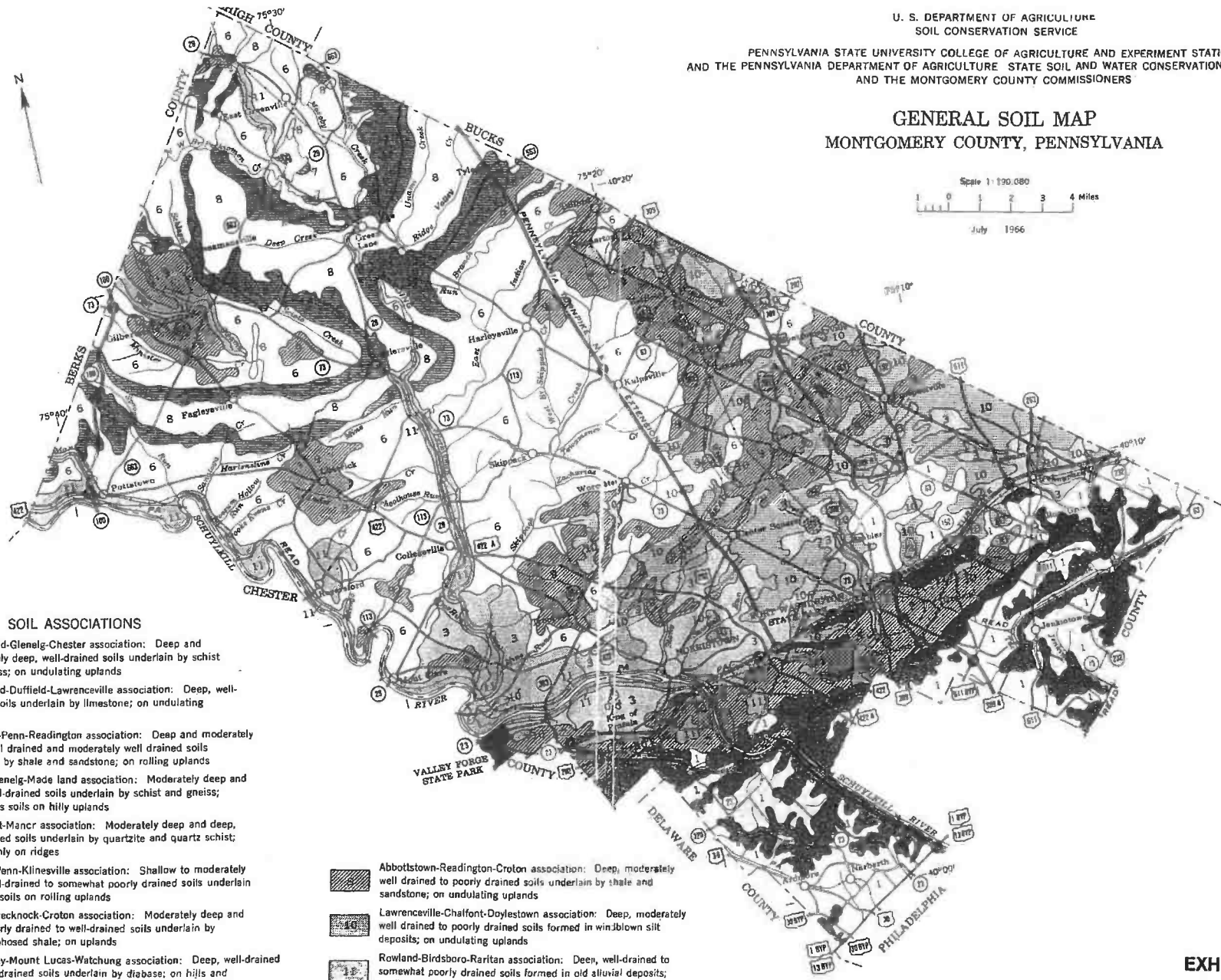


U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

PENNSYLVANIA STATE UNIVERSITY COLLEGE OF AGRICULTURE AND EXPERIMENT STATION  
AND THE PENNSYLVANIA DEPARTMENT OF AGRICULTURE STATE SOIL AND WATER CONSERVATION COMMISSION  
AND THE MONTGOMERY COUNTY COMMISSIONERS

GENERAL SOIL MAP  
MONTGOMERY COUNTY, PENNSYLVANIA

Scale 1:120,000  
1 0 1 2 3 4 Miles  
July 1966



SOIL ASSOCIATIONS

- Made land-Glenelg-Chester association: Deep and moderately deep, well-drained soils underlain by schist and gneiss; on undulating uplands
- Made land-Duffield-Lawrenceville association: Deep, well-drained soils underlain by limestone; on undulating uplands
- Lansdale-Penn-Readington association: Deep and moderately deep, well drained and moderately well drained soils underlain by shale and sandstone; on rolling uplands
- Manor-Glenelg-Made land association: Moderately deep and deep, well-drained soils underlain by schist and gneiss; micaceous soils on hilly uplands
- Edgemont-Manor association: Moderately deep and deep, well-drained soils underlain by quartzite and quartz schist; soils mainly on ridges
- Reaville-Penn-Klinesville association: Shallow to moderately deep, well-drained to somewhat poorly drained soils underlain by shale; soils on rolling uplands
- Lehigh-Brecknock-Croton association: Moderately deep and deep, poorly drained to well-drained soils underlain by metamorphosed shale; on uplands
- Nesheim-Mount Lucas-Watchung association: Deep, well-drained to poorly drained soils underlain by diabase; on hills and ridges

- Abbotstown-Readington-Croton association: Deep, moderately well drained to poorly drained soils underlain by shale and sandstone; on undulating uplands
- Lawrenceville-Chalfont-Doylestown association: Deep, moderately well drained to poorly drained soils formed in windblown silt deposits; on undulating uplands
- Rowland-Birdsboro-Raritan association: Deep, well-drained to somewhat poorly drained soils formed in old alluvial deposits; on flood plains and terraces

EXHIBIT #8



environmentally sensitive and may represent varying degrees of physical limitations of development according to the Comprehensive Plan Update.

The "Natural Features Map" (Exhibit 9) designates woodlands, prime agricultural land, and steep slopes in Plymouth Township. The following narrative is from the Township's Comprehensive Plan Update.

Extant woodlands in Plymouth are found sporadically and tend to have survived through the Township's main development period by virtue of their association with flood plains, wetlands, drainage swales and steep slopes. The largest wooded areas are along Diamond Run, behind the properties fronting Belvoir Road, and along Plymouth Creek and its tributaries.

Most of Plymouth was once actively farmed and prime agricultural land covers portions of the Township. Of the as-yet undeveloped areas, prime agricultural land is prominent east of the Northeast Extension and in the undeveloped area between Plymouth Road and North Gravers Road.

The soil series mapped in Pennsylvania by the US Soil Conservation Service have been placed in 15 groups, based on their limitations for subsurface disposal of effluent and the most probable percolation rates of those which are not eliminated from consideration from by flooding, seasonal water table, shallowness, or special pollution hazards.

Group 3 – Moderately Deep, Well Drain Soils with Probable Percolation Rates of One Inch of Water in 6 to 15 Minutes  
Manor Soils

Group 4 - Deep, Well Drain Soils with Probable Percolation Rates of One Inch of Water in 15 to 30 Minutes  
Chester Soils Group

Group 7 – Moderately Deep, Well Drain Soils with Probable Percolation Rates of One Inch of Water in 30 to 45 Minutes  
Glenelg & Lansdale Soils

Group 10 – Well Drain Soils with Probable Percolation Rates Slower than One Inches of Water in 60 Minutes  
Birds Borrow Soil

Group 11 – Soil Series that are Under Drain by Lime Stone and Have a High Hazard of Ground Water Pollution Through Solution Channels  
Duffield Soils

Group 13 – Soil Series that occur on Flood Plains and Have a High Flood Hazard. Not suitable for subsurface disposal systems.  
Rowland Soils

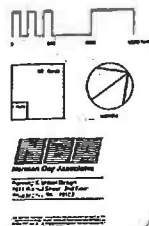
**EXHIBIT #9**

Montgomery County, PA  
**Comprehensive  
Plan Update**

1 Woodlands

2 Prime Agricultural Land

3 Steep Slopes



# Natural Features

Group 14 – Moderately Well Drained Soils on Upland Sites. The soils have seasonally high water tables which are the major limitation on use for subsurface disposal systems.

Lawrenceville, Penn, Readington & Raritan Soils

Group 15 – Some What Poorly, Poorly and Very Poorly Drained Soils on Upland Sites. These soils have high water tables and are unsuitable for subsurface disposal systems.

Chalfont & Doylestown Soils

#### D. Geologic Features

Montgomery County contains Sedimentary Igneous and Metamorphic Rocks. Ten among these are rocks that are nearly the oldest in the Country. The age of the rocks vary greatly, however, and in places the rocks make up the most recent formations. Figure #10 taken from the Montgomery County Soil Survey prepared by the US Department of Agriculture shows the location of the major kinds of bedrock in Plymouth Township. The northern portion of the Township contains Stockton Arkosic Sand Stone, Conglomerate and Shale. The southern portion contains Ledger Dolomite, Elbrook Limestone and Conestoga Limestone.

There is no data available indicating a potential Nitrate-Nitrogen Pollution.

#### I. Topography

The topography of the Township is gently rolling north of the Pennsylvania Turnpike and south of I-476, with a generally flat area in between. Lands between Sandy Hill Road and the Turnpike tend to be more steeply sloped than elsewhere and contain areas with slope greater than eight percent, qualifying them as moderately sloped. Steeply sloped areas, with slopes more than fifteen percent, may impose limitations on building due to the grade of the land itself, bedrock near the surface and potential for soil erosion.

#### F. Potable Water Supplies

Potable water in Plymouth Township is primarily supplied by the Pennsylvania-American Water Company (formerly, Philadelphia Suburban Water Company or PSW) and Aqua America Pennsylvania (AAP). Several areas of un-served properties do exist where landowners continue to withdraw water from private wells.

The Pennsylvania-American Water Company serves the western corner of Plymouth Township, with water drawn from the Schuylkill River, treated at the Pennsylvania-American plant in Norristown, and then pumped through Norristown to Plymouth Township customers. AAP serves the remainder of the Township, utilizing an interconnected system of groundwater and surface sources. These sources include the Schuylkill River, several streams, and wells. Treatment occurs at the well source, at a major facility located at the AAP Upper Merion reservoir, and at other facilities in Bucks and Chester Counties.

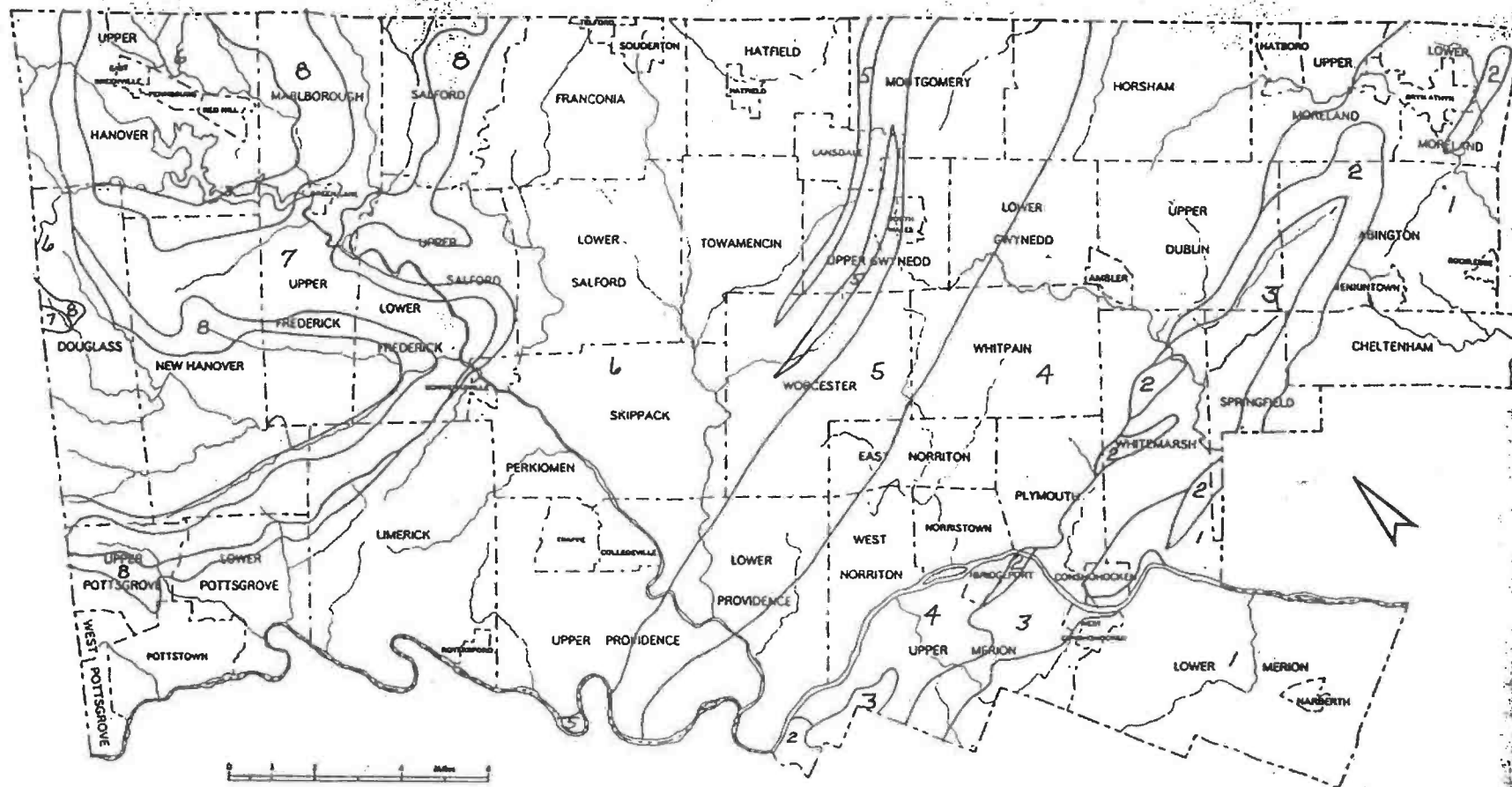


Figure 29.—Bedrock geology of Montgomery County, according to geologic map of Pennsylvania, Commonwealth of Pennsylvania, Department of Internal Affairs, Topographic and Geologic Survey, 1960.

- |  |  |
|--|--|
| 1. Wissahickon schist, granite gneiss, and hornblende gneiss and schist. | 5. Lockatong argillite and shale.              |
| 2. Chickies quartzite and quartz schist.                                 | 6. Brunswick shale and fine-grained sandstone. |
| 3. Ledger dolomite, Elbrook limestone, and Conestoga limestone.          | 7. Diabase.                                    |
| 4. Stockton arkosic sandstone, conglomerate, and shale.                  | 8. Hornfels.                                   |

AAP has two small wells in Plymouth Township. These wells are integrated into PSW's overall regional water supply system. According to the Township's Comprehensive Plan, the Karrs Lane well has a pumping capacity of two million gallons per day (GPD), with an average daily withdrawal of 1,800,000 GPD. "Plymouth #1" is smaller: Plymouth #1, on Sandy Hill Road at the Philadelphia Electric Company (PECO) transmission line, has a pumping capacity of 200,000 GPD and an average daily withdrawal of 120,000 GPD.

G. Wetland

Exhibit #7 is a map showing wetland areas as defined by the USDA Soil Conservation Service.

## DESCRIPTION OF EXISTING SEWAGE FACILITIES

A. Municipal Sewage Facilities

Plymouth Township's sewer system consists of gravity collection sewers, pumping stations, force mains and interceptors which convey most of the sewage generated in the Township to the East Norriton-Plymouth-Whitpain Joint Sewer Authority wastewater treatment plant (ENPW WWTP). The Township's system also conveys portions of wastewater generated from neighboring municipalities to the ENPW WWTP. The ENPW WWTP is located in the northwest corner of the Township.

The sewage generated in the southern section of the Township (Colwell Road and adjoining areas) is conveyed to the Conshohocken Borough Authority wastewater treatment plant. A small portion of the Township's sewage is treated at the Whitemarsh Township wastewater treatment plant. The Butler Pike, Keys Street, Kirk Street, Progress Road area sends its sewage to the Whitemarsh facility. A few properties in the Curren Terrace section are connected to the Borough Norristown collection system.

Historically, the ENPW WWTP operated on a first-come, first-serve basis for development within the Plymouth-East Norriton-Whitpain area. In order to provide for better planning, each municipality was given an allocation of available capacity at the plant. When capacity was reached at the WWTP, expansion will be made with each of the municipalities contributing equally to the capital cost. Current discussions concerning an application for State rerating of the plant and future plant expansion have focused on the issue of capacity allocations to the participating municipalities.

1. Sewage Collection and Conveyance Systems

The majority of the original sanitary sewer system was designed and constructed in the late 1950's and early 1960's. The system has been expanded over the years to accommodate development. The majority of the gravity collection system consists of three types of pipe materials, vitrified clay pipe (VCP), reinforced concrete pipe (RCP), and poly vinyl chloride (PVC) pipe. Pipe sizes for the gravity collection system range from six to twenty-four inches. Manholes in the system are both brick and precast concrete. Most of the original pipe work in the system is comprised of VCP with brick manholes. Sizes for the clay pipe range from six to fifteen inches. This pipe material is also found in the older portions of the system. Reinforced concrete pipe is found on

portions of the interceptors with eighteen inch diameters and greater. PVC pipe can be found in the newer portions of the collection system, along with precast concrete manholes. PVC pipe is generally of eight inch diameter, as the larger diameter collector pipes and interceptors were in place before the use of PVC pipe. The force mains associated with each of the pumping stations are mechanical joint ductile iron. The force mains range in size from four to sixteen inches. Each force main discharges into a manhole in the gravity collection system.

The collection system includes about 1,308 manholes in the section that connects with ENPW WWTP and approximately 158 manholes in the Conshohocken section. Manhole depths range between two and about fifteen feet.

The Township's sewer system includes eight major interceptors. Seven of these interceptors convey the flow to the East Norriton-Plymouth-Whitpain Joint Sewer Authority. The other interceptor conveys the flow to the Conshohocken Borough Authority wastewater treatment plant.

The ENPWJSA maintains an interceptor that runs along Fairfield Road, Jefferson Street and Ross Street to the Plant. This line carries the outflow from the Authority's Sawmill Pumping Station. In addition, there are a number of gravity connections from Plymouth Township.

The collection system consists of approximately 318,450 feet of gravity sewers, 13,101 feet of force main, and includes six pumping stations. A copy of the Sewage Facilities Map is shown on Exhibit #11.

There is one Class I industrial user, Stroehman and one Class II industrial user, Markel Corporation.

North of approximately Sandy Hill Road and east of the Northeast Extension of the Turnpike, most flow ends up in an interceptor following Sawmill Run (in the northern corner of the Township) and reaching the ENPW WWTP by way of East Norriton Township, Norristown Borough and the Saw Mill Run Interceptor on Fairfield Road. South of approximately Sandy Hill Road, most of the wastewater destined for the Joint Sewer Authority facility joins an interceptor along Chemical Road, and is pumped up along the southwest side of PECO substation, under the turnpike to Belvoir Road. From here, a second major interceptor (Diamond Run) transports the flow to the treatment plant.

**ENPV JSA Plant**

<u>Name</u>	<u>Size</u>	<u>Length</u>	<u>Manholes</u>	<u>From Manhole</u>	<u>To Manhole</u>
PLYMOUTH CREEK	10-12"	6,200'	30	529 (Germantown & Chemical)	400 (Chemical Rd PS)
PLYMOUTH ROAD (feeds Plymouth Creek)	10-18"	6,000'	30	904 (Germantown near Launfall)	490 (Chemical near Blue Route)
CHEMICAL ROAD	10-10"	4,625'	21	1112 (Gallagher near Swim Club)	400 (Chemical Road PS)
DIAMOND RUN (Formerly Belvoir Road)	21-21"	4,900'	28	262 (Belvoir Road at School Lane)	201 (ENPWJSA WWTP)
VALLEY CREEK (feeds Saw Mill)	10-10"	6,800'	38	370 (Twp Line Rd near Walton Rd)	46 (Mill Creek at Germantown)
CHURCH ROAD (feeds Saw Mill)	18-21"	4,150'	19	167 (Twp Line Rd near Sheffield)	46 (Mill Creek at Germantown)
SAW MILL	21-24"	4,250'	18	46 (Mill Creek at Germantown)	619 (New Hope St at Saw Mill Run)

**Conshohocken Plant**

<u>Name</u>	<u>Size</u>	<u>Length</u>	<u>Manholes</u>	<u>From Manhole</u>	<u>To Manhole</u>
COLWELL LANE	12-18"	3,000'	12	C42 (Colwell at Palmer)	C26 (Meter on Colwell Road)

July 11, 2000

The Plymouth Township system contains the following six pump stations:

**IPW JSA Plant**

<b><u>Location</u></b>	<b><u>Force Main Size (in)</u></b>	<b><u>Force Main Length (ft)</u></b>	<b><u>Year Built/ Major Rehab</u></b>	<b><u>Type Wet Well Type Dry Well</u></b>	<b><u># and Size of Pumps</u></b>
CHEMICAL ROAD	16	4,900	1959/1993/2000	conc/conc	3 – 6"
TURF LANE	4	640	1964/1993	conc/steel	2 – 4"
NARCISSA ROAD	6	4,556	2004	conc/conc	2 – 4"
CURRENT TERRACE	4	300	1959/1993	conc/conc	2 – 4"
PLYMOUTH HUNT	4	1,725	1986/1993	conc/steel	pneumatic

**Washohocken Plant**

FULTON STREET	4	980	1990	conc/conc	2 – 2"
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## 2. Sewage Treatment Systems

There are four sewer service areas in Plymouth Township with four wastewater treatment plants serving the Township. There are no WWTPs under the jurisdiction of Plymouth Township.

The wastewater treatment plants serving Plymouth Township plants provide a combined reserved treatment capacity to Plymouth Township of approximately 3,969,750 gpd or 3.97 mgd.

### A. East Norriton-Plymouth-Whitpain Joint Sewer Treatment Plant: 3,100,000 gpd – Plymouth Allocated Capacity

Plymouth and East Norriton contributed to the costs of construction this plant and appoint six of the nine members of the Joint Sewer Authority. Whitpain Township to become a full member in 1992, Whitpain appoints three members to the Authority. Plant capacity is 9.3 mgd and Plymouth's share is 3.1 mgd.

The ENPWSJA wastewater treatment plant is located in Plymouth Township, Montgomery County. The plant provides advanced secondary treatment for an average annual permitted flow of 8.1 MGD. Two trickling filtration process trains and an activated sludge process provide for treatment of the wastewater. The wastewater treatment plant discharges treated effluent to the adjacent Schuylkill River. In accordance with the current NPDES Permit (Permit No. PA 0026816), the plant is permitted to discharge 9.3 MGD monthly average and 8.1 MGD annual average flow. Monthly effluent NPDES limits include 20 mg/L CBOD<sub>5</sub> from May through October and 25 mg/L from November through April. The suspended solids average limit is 30 mg/L monthly. The annual flow for 2004 was 6.44 MGD. The highest consecutive maximum three-month average for 2004 was 7.75 MGD.

Wastewater enters the treatment plant at the Raw Sewage Pump Station. Flow can be conveyed to one of two sets of primary clarifiers. One set of primary clarifiers. One set of primary clarifiers serves the activated sludge process. The other set of primary clarifiers serves the trickling filter process train. From either the activated sludge or trickling filter processes, flow is directed to the secondary clarifiers or secondary settling tanks respectively. Effluent from the clarifiers is conveyed to chlorine contact tanks for disinfection and discharged to the Schuylkill River.

The ENPWJSA is not projecting hydraulic or organic overloads in the near future. Additionally, the ENPWJSA will continue its on-going maintenance program and make capital facility improvements as required.

During 2002, major improvements were started to the chemical feed and odor control systems and were completed in early 2003. Included in the improvements are:

- Installation of a new sludge press polymer feed system, including pumps and dry/liquid polymer feed with bag loader.

## 2005 PLYMOUTH TOWNSHIP ACT 537 UPDATE

- Installation of a new potassium permanganate feed system for odor control, including pumps and a "Cycle-Bin" feed hopper for ease of handling the chemical.
- Installation of a carbon odor control system in the Dewatering Building, including an activated carbon absorber, centrifugal fan assembly and fiberglass reinforced plastic ductwork.

Other plant modifications and repairs in 2002 included:

- Rebuilding of activated sludge #2 raw sewage pump.
- Replacing of the impeller and motor on activated sludge #2 secondary sludge Pump.
- Replacing of the discharge disc on #1 sludge pump in the press room.
- Replacing the right side main shaft on Penn Valley #1 sludge pump (press room).
- Rebuilding trickling filter #2 raw sewage pump.
- Rebuilding of trickling filter west side #2 secondary pump.
- Replacing of packing sleeve and bearings on trickling filter #2 raw sewage pump.
- Replacing of shaft and rebuilding of trickling filter west side #1 primary pump.
- Rebuilding of skim arm on activated sludge T1-A primary clarifier.

All of the treatment plant and major tributary flow meters were calibrated during 2002.

Ultimate disposal for the wastewater collected and treated in the planning area is a stream discharge. Identification of other ultimate disposal areas is not applicable to this Plan.

### B. Conshohocken Treatment Plant: 785,000 gpd – Plymouth Allocated Capacity

Plymouth has purchased a total capacity of 785,000 gpd in the plant.

On December 31, 1990, Plymouth Township and the Fourtees Company entered into an agreement wherein the Fourtees Company agreed to purchase 391,500 gallon per date (1423.6 EDU's) capacity from the expansion of the Conshohocken Sewage Treatment Plant. On March 7, 1995, the plant expansion was complete. On March 7, 2005, any unused capacity became the property of Plymouth Township.

## 2005 PLYMOUTH TOWNSHIP ACT 537 UPDATE

	Connected EDU's
BJ's	54
Home Depot	57
Office Max	12
Circuit City	4
IKEA	74
Durrey Develop.	10
Tee's Golf	1
Brookwood	10
Jones Brothers	4
Ikea Office	50
<b>Total</b>	<b>276</b>

An additional 300 EDU's have been allocated to the Blue Route Industrial Center, which has not been submitted or approved, but is planned. On March 7, 2005 847.6 EDU's became available to Plymouth Township.

### C. Whitemarsh Township: 82,500 gpd – Plymouth Use

Several residences and businesses along the eastern portion of Plymouth are connected to the Whitemarsh system; the total number of EDU's is 330. At 250 gpd/EDU, the capacity is  $330 \text{ EDU} \times 250 \text{ gpd/EDU} = 82,500 \text{ gpd/EDU}$ .

### D. Norristown Borough: 2,250 gpd – Plymouth Use

This arrangement is similar to the one with Whitemarsh; the number of Plymouth homes (EDUs) being discharged to Norristown is 9. At 250 gpd/EDU, the capacity is  $9 \text{ EDU} \times 250 \text{ gpd/EDU} = 2,250 \text{ gpd}$ .

Details of these Wastewater Treatment Facilities are not included in this report since they are not owned or operated by Plymouth Township.

## 3. Problems with Existing Facilities

Plymouth Township retained PSC Engineers & Consultants (PSCE&C) to perform an evaluation study of the Township's sanitary sewer system in 1992.

The aim of the sewerage facilities evaluation was to determine the physical condition and available capacity of the Township's sanitary sewer system, including the collection system, interceptor lines, force mains and pump stations.

The 1992 Report identified 30 pipe segments, consisting of about 8,720 feet of sewer pipe, that were leaking and admitting ground water infiltration into the sewer system. The report also located private laterals with a night time flow of approximately 103,600 gallons per day. Sources of inflow were identified by the 1992 Report at over 450 manholes. In response to the recommendations in 1993 Plymouth Township hired the firms of Jet Vac Services & Equipment and Floyd G. Hersch, Inc. to televise and repair those pipes and manholes found with sources of infiltration and inflow. Also, through the Township plumbing department, owners of laterals identified as having sources of infiltration were contacted and repairs were made in those systems in response to the recommendations in the report.

A capacity analysis of the existing sanitary sewer system was conducted. The report identified 18 pipe segments in the interceptor system that did not have adequate capacity to carry existing flows and an additional 45 sections that will not have adequate capacity to carry future flows (the ten year growth). In response to this recommendation, the Township removed and replaced a portion of the Plymouth Road interceptor from Manhole 501 to Manhole 498. This included boring under the Pennsylvania Turnpike for the new line. This work, performed by Falcone & Sons, Inc. was contracted at a price of \$468,297.00 in anticipation of upstream land development. The other areas identified as overloaded have been closely monitored by the Township Staff. No overflow of wastewater or surcharging of lines has been observed. Therefore, the implementation of the removal and replacement of identified overloaded interceptor segments has not been implemented but a program of inspection is in place.

The following table title Sanitary Sewer System Evaluation Full Pipe Capacity Analysis is an update of the PSC Engineers and Consultants calculation of 1992. This full pipe capacity analysis is based upon the sanitary sewer interceptor system as of June 2005:

**Plymouth Township  
Sanitary Sewer System Evaluation  
Full Pipe Capacity Analysis**

MH SECTION	PIPE DIAMETER (in)	SLOPE	VELOCITY (fps)	PHYSICAL CAPACITY (MGD)	LOCATION
VALLEY CREEK INTERCEPTOR					
370-369	10	0.0155	5.01	1.735	Between Township Line Road and the Northeast Extension Parallels Valley Creek
369-368	10	0.0053	2.93	1.014	
368-367	10	0.0057	3.04	1.052	
367-366	10	0.0056	3.01	1.043	
366-365B*	10	0.01	4.03	1.393	
365B-365A*	10	0.01	4.03	1.393	Under the Northeast Ext - Between the Northeast Ext and Germantown Pike Parallels Valley Creek
365A-365*	10	0.01	4.03	1.393	
365-364	10	0.0165	5.17	1.790	
364-363	10	0.0028	2.13	0.737	
363-362*	10	0.003	2.21	0.763	
362-361*	10	0.003	2.21	0.763	
361-360*	10	0.0124	4.49	1.551	
360-359*	10	0.0124	4.49	1.551	
359-358	10	0.015	4.93	1.706	
358-357	10	0.022	5.97	2.066	
357-356**	10	0.0087	3.76	1.300	Germantown Pike
356-355	10	0.087	11.88	4.109	
355-354	10	0.0175	5.33	1.843	
354-353	10	0.0175	5.33	1.843	
353-352*	10	0.067	10.43	3.606	
352-351	10	0.0028	2.13	0.737	
351-350	10	0.0028	2.13	0.737	
350-349	10	0.014	4.77	1.648	
349-348	10	0.014	4.77	1.648	
348-347	10	0.005	2.85	0.985	
347-346	10	0.005	2.85	0.985	
346-345	10	0.01	4.03	1.393	
345-344A	10	0.0176	5.34	1.848	
344A-344	10	0.0176	5.34	1.848	
344-343	10	0.0176	5.34	1.848	
343-342	10	0.004	2.55	0.881	
342-341**	10	0.004	2.55	0.881	
341-340*	10	0.004	2.55	0.881	
340-52B*	10	0.019	5.55	1.920	
52B-52A	10	0.019	5.55	1.920	
52A-53	12	0.019	6.27	3.123	
53-52	12	0.019	6.27	3.123	
52-46	12	0.0193	6.32	3.147	

**Plymouth Township  
Sanitary Sewer System Evaluation  
Full Pipe Capacity Analysis**

MH SECTION	PIPE DIAMETER (in)	SLOPE	VELOCITY (fps)	PHYSICAL CAPACITY (MGD)	LOCATION	
SAW MILL INTERCEPTOR						
46-43	24	0.002	3.23	6.433	Mill Creek Road	
43-42	24	0.002	3.23	6.433		
42-31	24	0.002	3.23	6.433		
31-30	24	0.002	3.23	6.433		
30-26	24	0.002	3.23	6.433		
26-25	24	0.002	3.23	6.433	Belvoir Road	
25-16	24	0.0094	7.00	13.947		
16-16B	24	0.002	3.23	6.433		
16B-16A	24	0.002	3.23	6.433		
16A-8	24	0.002	3.23	6.433		
8-7	24	0.004	4.57	9.098		
7-6	24	0.065	18.41	36.675		
6-5	24	0.0021	3.31	6.592		
5-4	24	0.0024	3.54	7.047		
4-3A	24	0.0021	3.31	6.592		
3A-3	24	0.038	14.07	28.042	Between Belvoir Road and Arch Road and Arch Road Parallels Sawmill Road	
3-2	24	0.005	5.11	10.172		
2-618	24	0.0021	3.31	6.592		
618-619	24	0.0066	5.87	11.687		
619-620	24	0.0021	3.31	6.592		
620-621	24	0.0021	3.31	6.592		
621-622	24	0.0021	3.31	6.592		
622-623	24	0.0021	3.31	6.592		
CHURCH ROAD INTERCEPTOR						
167-166	18	0.004	3.77	4.225		Parallels Sheffield Drive
166-166A*	18	0.005	4.21	4.723		
166A-166B*	18	0.005	4.21	4.723		
166B-165*	18	0.005	4.21	4.723		
165-164	18	0.0487	13.15	14.740		
164-164A*	18	0.0487	13.15	14.740	Church Road	
164A-163A	18	0.0042	3.86	4.329		
163A-163	18	0.0072	5.06	5.668		
163-162	18	0.0045	4.00	4.481		
162-161	18	0.0042	3.86	4.329		
161-160	18	0.004	3.77	4.225		
160-159	18	0.004	3.77	4.225		
159-158	18	0.004	3.77	4.225		
158-157	18	0.05	13.33	14.936		
157-156	18	0.026	9.61	10.770		
156-144	18	0.018	8.00	8.962	Creek Road	
144-143	21	0.003	3.62	5.519		
143-142	21	0.0045	4.71	8.615		
142-46	21	0.003	3.62	5.519		
						Germantown Pike

**Plymouth Township  
Sanitary Sewer System Evaluation  
Full Pipe Capacity Analysis**

MH SECTION	PIPE DIAMETER (in)	SLOPE	VELOCITY (fps)	PHYSICAL CAPACITY (MGD)	LOCATION
PLYMOUTH CREEK INTERCEPTOR					
536-529	10	0.003	2.21	0.763	Germantown Pike
529-528	10	0.003	2.21	0.763	Chemical Road
528-527	10	0.003	2.21	0.763	Parallels Plymouth Creek
527-526	10	0.003	2.21	0.763	
526-525	10	0.003	2.21	0.763	
525-524	10	0.003	2.21	0.763	
524-523	10	0.003	2.21	0.763	
523-522	10	0.003	2.21	0.763	
522-521	10	0.003	2.21	0.763	
521-490	10	0.003	2.21	0.763	
490-489	21	0.0016	2.64	4.030	
489-488	21	0.0016	2.64	4.030	
488-487	21	0.0016	2.64	4.030	
487-486	21	0.0016	2.64	4.030	
486-485	21	0.0016	2.64	4.030	
485-484	21	0.0016	2.64	4.030	
483-482	21	0.0016	2.64	4.030	
482-478	21	0.0016	2.64	4.030	
478-477	21	0.0016	2.64	4.030	
477-414	21	0.0016	2.64	4.030	
414-032	21	0.0015	2.55	3.965	Gallagher Road
032-033	21	0.0011	2.18	3.395	Between Gallagher Road and
033-034	21	0.0011	2.18	3.395	Chemical Road Pump Station
034-035	21	0.0012	2.28	3.546	Parallels Plymouth Creek
035-036	21	0.0011	2.18	3.395	
036-037	21	0.0011	2.18	3.395	
037-038	21	0.0011	2.18	3.395	
038-403	21	0.0139	7.75	12.070	
403-402	21	0.0016	2.64	4.030	
402-401	24	0.0018	3.06	6.204	
401-401A	36	0.0020	4.22	19.279	
401A-400	36	0.0067	7.72	35.288	

**Plymouth Township  
Sanitary Sewer System Evaluation  
Full Pipe Capacity Analysis**

MH SECTION	PIPE DIAMETER (in)	SLOPE	VELOCITY (fps)	PHYSICAL CAPACITY (MGD)	LOCATION
PLYMOUTH ROAD INTERCEPTOR					
915-968**	10	0.0045	2.70	0.935	Arthur Court Between Arthur Court and Plymouth Road
968-969**	10	0.0053	2.93	1.014	
969-970**	10	0.0145	4.85	1.678	
970-970A+	10	0.0028	2.13	0.737	
970A-505B+	10	0.0028	2.13	0.737	
505B-505A+	10	0.0028	2.13	0.737	Between Plymouth Road and Turnpike
505A-505+	10	0.0028	2.13	0.737	
505-504+	10	0.014	4.77	1.648	
504-503A*	10	0.014	4.77	1.648	
503A-503*	10	0.014	4.77	1.648	
503-502A*	10	0.012	4.41	1.526	Between Turnpike and Chemical Road
502A-502*	10	0.012	4.41	1.526	
502-501	10	0.012	4.41	1.526	
501-500A	18	0.004	3.75	4.290	
500A-500	18	0.004	3.75	4.290	
500-499	18	0.0021	2.65	3.030	
499-498	18	0.002	2.65	3.030	
498-497	18	0.0065	4.78	5.470	
497-496	10	0.01	4.03	1.393	
496-495	10	0.01	4.03	1.393	
495-494	10	0.01	4.03	1.393	
494-493	10	0.01	4.03	1.393	
493-492	14	0.01	5.04	3.417	
492-491A	14	0.02	7.13	4.833	
491A-491*	14	0.02	7.13	4.833	
491-490	18	0.003	3.26	3.659	



**Plymouth Township  
Sanitary Sewer System Evaluation  
Full Pipe Capacity Analysis**

MH SECTION	PIPE DIAMETER (in)	SLOPE	VELOCITY (fps)	PHYSICAL CAPACITY (MGD)	LOCATION
CHEMICAL ROAD INTERCEPTOR					
1112-1111	10	0.008	3.60	1.246	Between Gallagher Road and Turnpike
1111-1110	10	0.0081	3.63	1.254	
1110-1109	10	0.0067	3.30	1.140	
1109-1108	10	0.0067	3.30	1.140	
1108-1107	10	0.0167	5.21	1.800	
1107-509	10	0.0028	2.13	0.737	Under the Turnpike Between the Turnpike and Chemical Road Pump Station
509-508	10	0.0028	2.13	0.737	
508-507a*	10	0.0028	2.13	0.737	
507a-507*	10	0.0028	2.13	0.737	
507-506	10	0.014	4.77	1.648	
506-1069	10	0.0028	2.13	0.737	
1069-1068	10	0.016	5.09	1.762	
1068-1067	10	0.0028	2.13	0.737	
1067-1066	10	0.0028	2.13	0.737	
1066-1065	10	0.018	5.40	1.869	
1065-1064	10	0.0028	2.13	0.737	
1064-1063	10	0.0028	2.13	0.737	
1063-1062	10	0.0145	4.85	1.678	
1062-1061	10	0.0028	2.13	0.737	
1061-1060	10	0.0029	2.17	0.750	
1060-401	10	0.0028	2.13	0.737	

**Plymouth Township  
Sanitary Sewer System Evaluation  
Full Pipe Capacity Analysis**

MH SECTION	PIPE DIAMETER (in)	SLOPE	VELOCITY (fps)	PHYSICAL CAPACITY (MGD)	LOCATION
DIAMOND RUN INTERCEPTOR					
262-258+	16.5	0.008	6.54	6.158	Belvoir Road
258-255+	16.5	0.004	4.62	4.355	
255-254+	16.5	0.004	4.62	4.355	
254-251+	16.5	0.004	4.62	4.355	
251-250+	16.5	0.01	7.31	6.885	Hillside Road
250-248+	16.5	0.028	12.23	11.521	
248-247+	16.5	0.01	7.31	6.885	
247-244+	16.5	0.034	13.48	12.696	
244-243+	16.5	0.006	5.66	5.333	
243-242+	16.5	0.004	4.62	4.355	School Lane
242-236+	16.5	0.04	14.62	13.771	Ridge Pike
236-233+	16.5	0.004	4.62	4.355	
233-232+	16.5	0.047	15.85	14.927	
232-299+	16.5	0.044	15.34	14.443	
229-228+	16.5	0.018	9.81	9.238	
228-221+	16.5	0.018	9.81	9.238	
221-220+	16.5	0.012	8.01	7.542	Between Ridge Pike
220-219+	16.5	0.012	8.01	7.542	and Diamond Avenue
219-218+	16.5	0.008	6.54	6.158	
218-211+	16.5	0.004	4.62	4.355	
211-206+	16.5	0.01	7.31	6.885	Between Diamond Avenue and
206-205+	16.5	0.003	4.00	3.771	East Norriton-Plymouth WWTP
205-204+	16.5	0.003	4.00	3.771	
204-202+	16.5	0.003	4.00	3.771	
202-201	21	0.003	3.62	5.519	

+ According to Township personnel, this interceptor was slip lined with 16.5 inch diameter PVC to manhole 202. The n factor for PVC is 0.010 as opposed to 0.013 for concrete.

**Plymouth Township  
Sanitary Sewer System Evaluation  
Full Pipe Capacity Analysis**

MH SECTION	PIPE DIAMETER (in)	SLOPE	VELOCITY (fps)	PHYSICAL CAPACITY (MGD)	LOCATION
COLWELL LANE INTERCEPTOR					
C039-C040	12	0.004	2.88	1.433	
C038-C039+	12	0.0022	2.13	1.063	
C037-C038	12	0.0012	1.58	0.785	
C035-C037	12	0.0012	1.58	0.785	
C208-C035	12	0.0022	2.13	1.063	
C200-C208	12	0.0012	1.58	0.785	
C200-C030	18	0.0012	2.06	2.314	
C030-C029	18	0.0012	2.06	2.314	
C029-C028	18	0.0012	2.06	2.314	
C028-C027	18	0.0012	2.06	2.314	
C027-C026	18	0.0012	2.06	2.314	

\* Assumed slope since a manhole was added between two existing manholes.

\*\* Calculated slope from pipe invert elevations and distances.

+ Used the minimum slope for the appropriate diameter.

The Plymouth Township Available Capacity Determination, which was originally prepared in the 1992 report was also updated. This analysis recognizes the additional EDU's (column 4) that had been connected to the system from 1992 to 2005. The future EDU's shown in column 7 are those that have been approved but not constructed or occupied in Plymouth Township. Based upon this analysis, we were able to determine areas with current capacity problems and potential future capacity problems. These are the areas that will be concentrated upon with routine inspection, metering, etc.

# AVAILABLE CAPACITY DETERMINATION

MH SECTION	PHYSICAL CAPACITY (MGD)	1992 LOADING (MGD)	ADDITIONAL (EDU)	CURRENT LOADING (MGD)	AVAILABLE CURRENT CAPACITY (MGD)	FUTURE (EDU)	FUTURE LOADING (MGD)	AVAILABLE FUTURE CAPACITY (MGD)
VALLEY CREEK INTERCEPTOR								
370-369	1.735	0.4646 *	60.69	0.5150	1.2200	100	0.5980	1.1370
369-368	1.014	0.4646 *	60.69	0.5150	0.4990	100	0.5980	0.4160
368-367	1.052	0.4646 *	60.69	0.5150	0.5370	100	0.5980	0.4540
367-366	1.043	0.4646 *	60.69	0.5150	0.5280	100	0.5980	0.4450
366-365B*	1.393	0.4646 *	60.69	0.5150	0.8780	100	0.5980	0.7950
365B-365A*	1.393	0.4646 *	60.69	0.5150	0.8780	100	0.5980	0.7950
365A-365*	1.393	0.4646 *	123.69	0.5673	0.8257	100	0.6503	0.7427
365-364	1.790	0.4646 *	123.69	0.5673	1.2227	100	0.6503	1.1397
364-363	0.737	0.4646 *	123.69	0.5673	0.1697	100	0.6503	0.0867
363-362*	0.763	0.4646 *	123.69	0.5673	0.1957	100	0.6503	0.1127
362-361*	0.763	0.4646 *	123.69	0.5673	0.1957	100	0.6503	0.1127
361-360*	1.551	0.4646 *	123.69	0.5673	0.9837	100	0.6503	0.9007
360-359*	1.551	0.4646 *	138.69	0.5797	0.9713	100	0.6627	0.8883
359-358	1.706	0.4646 *	138.69	0.5797	1.1263	100	0.6627	1.0433
358-357	2.066	0.4646 *	138.69	0.5797	1.4863	100	0.6627	1.4033
357-356**	1.300	0.4646 *	138.69	0.5797	0.7203	100	0.6627	0.6373
356-355	4.109	0.4646 *	138.69	0.5797	3.5293	100	0.6627	3.4463
355-354	1.843	0.4646 *	138.69	0.5797	1.2633	100	0.6627	1.1803
354-353	1.843	0.8576	138.69	0.9727	0.8703	100	1.0557	0.7873
353-352*	3.606	0.8576	138.69	0.9727	2.6333	100	1.0557	2.5503
352-351	0.737	0.8576	138.69	0.9727	-0.2357	100	1.0557	-0.3187
351-350	0.737	0.8576	203.69	1.0267	-0.2897	100	1.1097	-0.3727
350-349	1.648	0.8576	203.69	1.0267	0.6213	100	1.1097	0.5383
349-348	1.648	0.8576	203.69	1.0267	0.6213	100	1.1097	0.5383
348-347	0.985	0.8576	203.69	1.0267	-0.0417	100	1.1097	-0.1247
347-346	0.985	0.8576	203.69	1.0267	-0.0417	100	1.1097	-0.1247
346-345	1.393	0.8576	203.69	1.0267	0.3663	100	1.1097	0.2833
345-344A	1.848	0.8576	203.69	1.0267	0.8213	100	1.1097	0.7383
344A-344	1.848	0.8576	203.69	1.0267	0.8213	100	1.1097	0.7383

# AVAILABLE CAPACITY DETERMINATION

MH SECTION	PHYSICAL CAPACITY (MGD)	1992 LOADING (MGD)	ADDITIONAL (EDU)	CURRENT LOADING (MGD)	AVAILABLE CURRENT CAPACITY (MGD)	FUTURE (EDU)	FUTURE LOADING (MGD)	AVAILABLE FUTURE CAPACITY (MGD)
VALLEY CREEK INTERCEPTOR CONTINUED								
341-340*	0.881	0.8576	203.69	1.0267	-0.1457	100	1.1097	-0.2287
340-52B*	1.920	0.8576	203.69	1.0267	0.8933	100	1.1097	0.8103
52B-52A	1.920	1.2018	284.69	1.4381	0.4819	100	1.5211	0.3989
52A-53	3.123	1.2018	284.69	1.4381	1.6849	100	1.5211	1.6019
53-52	3.123	1.2018	284.69	1.4381	1.6849	100	1.5211	1.6019
52-46	3.147	1.2018	284.69	1.4381	1.7089	100	1.5211	1.6259

\*Highest Meter Reading Measured July 01 - July 03 at Walton Road Meter

# AVAILABLE CAPACITY DETERMINATION

MH SECTION	PHYSICAL CAPACITY (MGD)	1992 LOADING (MGD)	ADDITIONAL (EDU)	CURRENT LOADING (MGD)	AVAILABLE CURRENT CAPACITY (MGD)	FUTURE (EDU)	FUTURE LOADING (MGD)	AVAILABLE FUTURE CAPACITY (MGD)
SAW MILL INTERCEPTOR								
46-43	6.433	2.9826	318.69	3.2471	3.1859	115	3.3426	3.0904
43-42	6.433	2.9826	318.69	3.2471	3.1859	115	3.3426	3.0904
42-31	6.433	2.9826	318.69	3.2471	3.1859	115	3.3426	3.0904
31-30	6.433	2.9826	318.69	3.2471	3.1859	115	3.3426	3.0904
30-26	6.433	2.9826	318.69	3.2471	3.1859	115	3.3426	3.0904
26-25	6.433	2.9826	318.69	3.2471	3.1859	115	3.3426	3.0904
25-16	13.947	2.9826	318.69	3.2471	10.6999	115	3.3426	10.6044
16-16B	6.433	2.9826	318.69	3.2471	3.1859	115	3.3426	3.0904
16B-16A	6.433	2.9826	318.69	3.2471	3.1859	115	3.3426	3.0904
16A-8	6.433	2.9826	318.69	3.2471	3.1859	115	3.3426	3.0904
8-7	9.098	2.9826	318.69	3.2471	5.8509	115	3.3426	5.7554
7-6	36.675	2.9826	318.69	3.2471	33.4279	115	3.3426	33.3324
6-5	6.592	3.2458	370.69	3.5535	3.0385	115	3.6489	2.9431
5-4	7.047	3.2458	370.69	3.5535	3.4935	115	3.6489	3.3981
4-3A	6.592	3.2458	370.69	3.5535	3.0385	115	3.6489	2.9431
3A-3	28.042	3.2458	370.69	3.5535	24.4885	115	3.6489	24.3931
3-2	10.172	3.2458	370.69	3.5535	6.6185	115	3.6489	6.5231
2-618	6.592	3.2458	370.69	3.5535	3.0385	115	3.6489	2.9431
618-619	11.687	3.2458	370.69	3.5535	8.1335	115	3.6489	8.0381
619-620	6.592	3.2458	370.69	3.5535	3.0385	115	3.6489	2.9431
620-621	6.592	3.2458	370.69	3.5535	3.0385	115	3.6489	2.9431
621-622	6.592	3.2458	370.69	3.5535	3.0385	115	3.6489	2.9431
622-623	6.592	3.2458	370.69	3.5535	3.0385	115	3.6489	2.9431

# AVAILABLE CAPACITY DETERMINATION

MH SECTION	PHYSICAL CAPACITY (MGD)	1992 LOADING (MGD)	ADDITIONAL (EDU)	CURRENT LOADING (MGD)	AVAILABLE CURRENT CAPACITY (MGD)	FUTURE (EDU)	FUTURE LOADING (MGD)	AVAILABLE FUTURE CAPACITY (MGD)
CHURCH ROAD INTERCEPTOR								
167-166	4.225	1.2230 *	0.00	1.2230	3.0020	2	1.2247	3.0003
166-166A*	4.723	1.2230 *	0.00	1.2230	3.5000	2	1.2247	3.4983
166A-166B*	4.723	1.2230 *	0.00	1.2230	3.5000	2	1.2247	3.4983
166B-165*	4.723	1.2230 *	0.00	1.2230	3.5000	2	1.2247	3.4983
165-164	14.740	1.2230 *	0.00	1.2230	13.5170	2	1.2247	13.5153
164-164A*	14.740	1.2230 *	0.00	1.2230	13.5170	2	1.2247	13.5153
164A-163A	4.329	1.2230 *	0.00	1.2230	3.1060	2	1.2247	3.1043
163A-163	5.668	1.2230 *	0.00	1.2230	4.4450	2	1.2247	4.4433
163-162	4.481	1.2230 *	0.00	1.2230	3.2580	2	1.2247	3.2563
162-161	4.329	1.2230 *	2.00	1.2247	3.1043	2	1.2263	3.1027
161-160	4.225	1.2230 *	2.00	1.2247	3.0003	2	1.2263	2.9987
160-159	4.225	1.2230 *	2.00	1.2247	3.0003	2	1.2263	2.9987
159-158	4.225	1.2230 *	2.00	1.2247	3.0003	2	1.2263	2.9987
158-157	14.936	1.2230 *	2.00	1.2247	13.7113	2	1.2263	13.7097
157-156	10.770	1.2230 *	2.00	1.2247	9.5453	2	1.2263	9.5437
156-144	8.962	1.2230 *	2.00	1.2247	7.7373	2	1.2263	7.7357
144-143	5.519	1.2230 *	2.00	1.2247	4.2943	2	1.2263	4.2927
143-142	8.615	1.2230 *	2.00	1.2247	7.3903	2	1.2263	7.3887
142-46	5.519	1.2230 *	2.00	1.2247	4.2943	2	1.2263	4.2927

\*Highest Meter Reading Measured July 01 - July 03 at Sheffield Road Meter



**AVAILABLE CAPACITY DETERMINATION**

MH SECTION	PHYSICAL CAPACITY (MGD)	1992 LOADING (MGD)	ADDITIONAL (EDU)	CURRENT LOADING (MGD)	AVAILABLE CURRENT CAPACITY (MGD)	FUTURE (EDU)	FUTURE LOADING (MGD)	AVAILABLE FUTURE CAPACITY (MGD)
<b>PLYMOUTH CREEK INTERCEPTOR</b>								
536-529	0.763	0.4664	23.00	0.4855	0.2775	740	1.0997	-0.3367
529-528	0.763	0.4664	23.00	0.4855	0.2775	740	1.0997	-0.3367
528-527	0.763	0.4664	23.00	0.4855	0.2775	740	1.0997	-0.3367
527-526	0.763	0.4664	23.00	0.4855	0.2775	740	1.0997	-0.3367
526-525	0.763	0.4664	23.00	0.4855	0.2775	740	1.0997	-0.3367
525-524	0.763	0.4664	23.00	0.4855	0.2775	740	1.0997	-0.3367
524-523	0.763	0.4664	23.00	0.4855	0.2775	740	1.0997	-0.3367
523-522	0.763	0.4664	23.00	0.4855	0.2775	740	1.0997	-0.3367
522-521	0.763	0.4664	23.00	0.4855	0.2775	740	1.0997	-0.3367
521-490	0.763	0.4664	23.00	0.4855	0.2775	740	1.0997	-0.3367
490-489	4.030	0.4664	1113.41	1.3905	2.6395	740	2.0047	2.0253
489-488	4.030	0.4664	1113.41	1.3905	2.6395	740	2.0047	2.0253
488-487	4.030	0.4664	1113.41	1.3905	2.6395	740	2.0047	2.0253
487-486	4.030	0.4664	1113.41	1.3905	2.6395	740	2.0047	2.0253
486-485	4.030	0.4664	1113.41	1.3905	2.6395	740	2.0047	2.0253
485-484	4.030	0.4664	1113.41	1.3905	2.6395	740	2.0047	2.0253
483-482	4.030	0.4664	1113.41	1.3905	2.6395	740	2.0047	2.0253
482-478	4.030	0.4664	1113.41	1.3905	2.6395	740	2.0047	2.0253
478-477	4.030	0.6408	1124.41	1.5741	2.4559	740	2.1883	1.8417
477-414	4.030	0.6408	1124.41	1.5741	2.4559	740	2.1883	1.8417
414-032	3.965	0.9018	1202.89	1.9002	2.0648	784	2.5509	1.4141
032-033	3.395	0.9018	1425.39	2.0849	1.3101	784	2.7356	0.6594
033-034	3.395	0.9018	1425.39	2.0849	1.3101	784	2.7356	0.6594
034-035	3.546	0.9018	1425.39	2.0849	1.4611	784	2.7356	0.8104
035-036	3.395	0.9018	1425.39	2.0849	1.3101	784	2.7356	0.6594
036-037	3.395	0.9018	1425.39	2.0849	1.3101	784	2.7356	0.6594
037-038	3.395	0.9018	1425.39	2.0849	1.3101	784	2.7356	0.6594
038-403	12.070	0.9018	1425.39	2.0849	9.9851	784	2.7356	9.3344
403-402	4.030	0.9018	1425.39	2.0849	1.9451	784	2.7356	1.2944
402-401	6.204	3.3684	1501.22	4.6144	1.5896	784	5.2651	0.9389
401-401A	19.279	3.3684	1501.22	4.6144	14.6646	784	5.2651	14.0139
401A-400	35.288	3.3684	1501.22	4.6144	30.6736	784	5.2651	30.0229

# AVAILABLE CAPACITY DETERMINATION

MH SECTION	PHYSICAL CAPACITY (MGD)	1992 LOADING (MGD)	ADDITIONAL (EDU)	CURRENT LOADING (MGD)	AVAILABLE CURRENT CAPACITY (MGD)	FUTURE (EDU)	FUTURE LOADING (MGD)	AVAILABLE FUTURE CAPACITY (MGD)
PLYMOUTH ROAD INTERCEPTOR								
915-968**	0.935	0.4664	494.41	0.8768	0.0582	0	0.8768	0.0582
968-969**	1.014	0.4664	494.41	0.8768	0.1372	0	0.8768	0.1372
969-970**	1.678	0.4664	494.41	0.8768	0.8012	0	0.8768	0.8012
970-970A+	0.737	0.4664	494.41	0.8768	-0.1398	0	0.8768	-0.1398
970A-505B+	0.737	0.4664	494.41	0.8768	-0.1398	0	0.8768	-0.1398
505B-505A+	0.737	0.4664	494.41	0.8768	-0.1398	0	0.8768	-0.1398
505A-505+	0.737	0.4664	494.41	0.8768	-0.1398	0	0.8768	-0.1398
505-504+	1.648	0.4664	494.41	0.8768	0.7712	0	0.8768	0.7712
504-503A*	1.648	0.4664	494.41	0.8768	0.7712	0	0.8768	0.7712
503A-503*	1.648	0.4664	494.41	0.8768	0.7712	0	0.8768	0.7712
503-502A*	1.526	0.4664	689.41	1.0386	0.4874	0	1.0386	0.4874
502A-502*	1.526	0.4664	689.41	1.0386	0.4874	0	1.0386	0.4874
502-501	1.526	0.4664	689.41	1.0386	0.4874	0	1.0386	0.4874
501-500A	4.290	0.4664	689.41	1.0386	3.2514	0	1.0386	3.2514
500A-500	4.290	0.4664	689.41	1.0386	3.2514	0	1.0386	3.2514
500-499	3.030	0.4664	818.41	1.1457	1.8843	0	1.1457	1.8843
499-498	3.030	0.4664	818.41	1.1457	1.8843	0	1.1457	1.8843
498-497	5.470	0.4664	818.41	1.1457	4.3243	0	1.1457	4.3243
497-496	1.393	0.4664	818.41	1.1457	0.2473	0	1.1457	0.2473
496-495	1.393	0.4664	818.41	1.1457	0.2473	0	1.1457	0.2473
495-494	1.393	0.4664	859.41	1.1797	0.2133	0	1.1797	0.2133
494-493	1.393	0.4664	859.41	1.1797	0.2133	0	1.1797	0.2133
493-492	3.417	0.4664	859.41	1.1797	2.2373	0	1.1797	2.2373
492-491A	4.833	0.4664	859.41	1.1797	3.6533	0	1.1797	3.6533
491A-491*	4.833	0.4664	859.41	1.1797	3.6533	0	1.1797	3.6533
491-490	3.659	0.4664	859.41	1.1797	2.4793	0	1.1797	2.4793

AVAILABLE CAPACITY DETERMINATION

MH SECTION	PHYSICAL CAPACITY (MGD)	1992 LOADING (MGD)	ADDITIONAL (EDU)	CURRENT LOADING (MGD)	AVAILABLE CURRENT CAPACITY (MGD)	FUTURE (EDU)	FUTURE LOADING (MGD)	AVAILABLE FUTURE CAPACITY (MGD)
CHEMICAL ROAD INTERCEPTOR								
1112-1111	1.246	0.6766	115.22	0.7722	0.4738	62	0.8237	0.4223
1111-1110	1.254	0.6766	115.22	0.7722	0.4818	62	0.8237	0.4303
1110-1109	1.140	0.6766	115.22	0.7722	0.3678	62	0.8237	0.3163
1109-1108	1.140	0.6766	115.22	0.7722	0.3678	62	0.8237	0.3163
1108-1107	1.800	0.6766	115.22	0.7722	1.0278	62	0.8237	0.9763
1107-509	0.737	0.6766	115.22	0.7722	-0.0352	487	1.1764	-0.4394
509-508	0.737	0.6766	115.22	0.7722	-0.0352	487	1.1764	-0.4394
508-507a*	0.737	0.6766	115.22	0.7722	-0.0352	487	1.1764	-0.4394
507a-507*	0.737	0.6766	115.22	0.7722	-0.0352	487	1.1764	-0.4394
507-506	1.648	0.6766	115.22	0.7722	0.8758	598	1.2686	0.3794
506-1069	0.737	0.6766	115.22	0.7722	-0.0352	598	1.2686	-0.5316
1069-1068	1.762	0.6766	115.22	0.7722	0.9898	598	1.2686	0.4934
1068-1067	0.737	0.6766	115.22	0.7722	-0.0352	598	1.2686	-0.5316
1067-1066	0.737	0.6766	138.97	0.7919	-0.0549	598	1.2883	-0.5513
1066-1065	1.869	0.6766	138.97	0.7919	1.0771	598	1.2883	0.5807
1065-1064	0.737	0.6766	138.97	0.7919	-0.0549	598	1.2883	-0.5513
1064-1063	0.737	0.6766	138.97	0.7919	-0.0549	598	1.2883	-0.5513
1063-1062	1.678	0.6766	138.97	0.7919	0.8861	598	1.2883	0.3897
1062-1061	0.737	0.6766	138.97	0.7919	-0.0549	598	1.2883	-0.5513
1061-1060	0.750	0.6766	138.97	0.7919	-0.0419	598	1.2883	-0.5383
1060-401	0.737	0.6766	138.97	0.7919	-0.0549	598	1.2883	-0.5513

# AVAILABLE CAPACITY DETERMINATION

MH SECTION	PHYSICAL CAPACITY (MGD)	1992 LOADING (MGD)	ADDITIONAL (EDU)	CURRENT LOADING (MGD)	AVAILABLE CURRENT CAPACITY (MGD)	FUTURE (EDU)	FUTURE LOADING (MGD)	AVAILABLE FUTURE CAPACITY (MGD)
DIAMOND RUN INTERCEPTOR								
262-258+	6.158	1.3907	995.00	2.2166	3.9415	0	2.2166	3.9415
258-255+	4.355	1.3907	995.00	2.2166	2.1385	0	2.2166	2.1385
255-254+	4.355	1.3907	995.00	2.2166	2.1385	0	2.2166	2.1385
254-251+	4.355	1.3907	995.00	2.2166	2.1385	0	2.2166	2.1385
251-250+	6.885	1.3907	995.00	2.2166	4.6685	32	2.2431	4.6419
250-248+	11.521	1.3907	995.00	2.2166	9.3045	32	2.2431	9.2779
248-247+	6.885	1.3907	995.00	2.2166	4.6685	32	2.2431	4.6419
247-244+	12.696	1.3907	995.00	2.2166	10.4795	32	2.2431	10.4529
244-243+	5.333	1.3907	997.00	2.2182	3.1148	32	2.2448	3.0882
243-242+	4.355	1.3907	997.00	2.2182	2.1368	32	2.2448	2.1102
242-236+	13.771	1.3907	997.00	2.2182	11.5528	32	2.2448	11.5262
236-233+	4.355	1.3907	997.00	2.2182	2.1368	32	2.2448	2.1102
233-232+	14.927	1.3907	997.00	2.2182	12.7088	119	2.3170	12.6100
232-299+	14.443	1.3907	997.00	2.2182	12.2248	119	2.3170	12.1260
229-228+	9.238	1.3907	997.00	2.2182	7.0198	119	2.3170	6.9210
228-221+	9.238	1.3907	997.00	2.2182	7.0198	119	2.3170	6.9210
221-220+	7.542	1.3907	1007.00	2.2265	5.3155	136	2.3394	5.2026
220-219+	7.542	1.3907	1007.00	2.2265	5.3155	136	2.3394	5.2026
219-218+	6.158	1.3907	1007.00	2.2265	3.9315	136	2.3394	3.8186
218-211+	4.355	1.3907	1007.00	2.2265	2.1285	136	2.3394	2.0156
211-206+	6.885	1.3907	1007.00	2.2265	4.6585	136	2.3394	4.5456
206-205+	3.771	1.3907	1007.00	2.2265	1.5445	136	2.3394	1.4316
205-204+	3.771	1.3907	1007.00	2.2265	1.5445	136	2.3394	1.4316
204-202+	3.771	1.3907	1007.00	2.2265	1.5445	136	2.3394	1.4316
202-201	5.519	1.3907	1007.00	2.2265	3.2925	136	2.3394	3.1796

+ According to Township personnel, this interceptor was slip lined with 16.5 inch diameter PVC to manhole 202. The n factor for PVC is 0.010 as opposed to 0.013 for concrete.

# AVAILABLE CAPACITY DETERMINATION

MH SECTION	PHYSICAL CAPACITY (MGD)	1992 LOADING (MGD)	ADDITIONAL (EDU)	CURRENT LOADING (MGD)	AVAILABLE CURRENT CAPACITY (MGD)	FUTURE (EDU)	FUTURE LOADING (MGD)	AVAILABLE FUTURE CAPACITY (MGD)
COLWELL LANE INTERCEPTOR								
C039-C040	1.433	0.3055	177.00	0.4524	0.9806	0	0.4524	0.9806
C038-C039+	1.063	0.3055	177.00	0.4524	0.6106	0	0.4524	0.6106
C037-C038	0.785	0.3055	177.00	0.4524	0.3326	0	0.4524	0.3326
C035-C037	0.785	0.3055	177.00	0.4524	0.3326	0	0.4524	0.3326
C208-C035	1.063	0.3055	177.00	0.4524	0.6106	0	0.4524	0.6106
C200-C208	0.785	0.3055	177.00	0.4524	0.3326	0	0.4524	0.3326
C200-C030	2.314	0.3055	177.00	0.4524	1.8616	0	0.4524	1.8616
C030-C029	2.314	0.3055	420.00	0.6541	1.6599	598	1.1504	1.1636
C029-C028	2.314	0.3055	420.00	0.6541	1.6599	598	1.1504	1.1636
C028-C027	2.314	0.3055	420.00	0.6541	1.6599	598	1.1504	1.1636
C027-C026	2.314	0.3055	420.00	0.6541	1.6599	598	1.1504	1.1636

\* Assumed slope since a manhole was added between two existing manholes.

\*\* Calculated slope from pipe invert elevations and distances.

+ Used the minimum slope for the appropriate diameter.

The six pumping stations in the Plymouth Township System were evaluated and recommendations proposed in the 1992 Report. All of the improvements to the pumping stations have been completed, including the expansion of the Chemical Road Pumping Station from 2.7 mgd to 3.50 mgd.

The 1992 Act 537 Plan for Plymouth Township determined that an expansion would be required for the Narcissa Road Pumping Station. A draw down test conducted on August 17, 2000, determined that the current capacity of the pumping station was 62 gallons per minute. The force main from the Narcissa Road Pumping Station was relocated for relocation in 2004 to Hickory Road with discharge to Manhole 907 at the intersection of Hickory Road and Germantown Pike. The sewer system evaluation survey of 1992 identified three down stream areas from this point with restrictions. It is for this reason that the pumping station was limited to 200 gallons per minute maximum discharge. This will provide capacity for the Narcissa Road Pumping Station subdrainage area.

The current condition of the collection conveyance systems in Plymouth Township is good. The Township continues to search for and eliminate infiltration and inflow. The Township has a program for the cleaning and removal of roots, as well as grease blockages which occasionally occur.

There are no know violations of the NPDES Permit, Clean Streams Law Permit or other permit, rule or regulation of the Pennsylvania Department of Transportation.

4. Upgrading or Expansion of Treatment Facilities

Since none of the treatment facilities are owned and operated by Plymouth Township, other reports will document this information.

5. On-Lot Systems

Many Plymouth Township residences and businesses have on-site sewage disposal systems, despite the extensive coverage of the Township provided by the centralized sewage collection network. Between Ridge Pike and Schuylkill River, most of the industrial area remains un-served by central sewers. Other areas with on-site sewage disposal systems include Gallagher Road, between the Turnpike and the Trenton Cutoff railroad line; Plymouth Road, south of the I-476 Turnpike interchange; Narcissa Road; Walton Road, between Germantown Pike and the Northeast Extension; Sandy Hill Road-Whites Road-Johnson Road; Sandy Hill Road, between north Plymouth Road and the west end of the Plymouth Country Club property; Plymouth Road, north of Belvoir Road; and Thomas Road. There are approximately 220 systems.

# ON-LOT SEWAGE DISPOSAL SYSTEMS IN PLYMOUTH TOWNSHIP

(Source: Township Records)

Owner	Number Street	Block_unit
RECYCLE METALS CORP	407 Alan Wood Rd	022A040
MARINELLO ANTHONY J & DELORES P	973 Belvoir Rd	035 115
DEIUSHIO VINCENT	1002 Belvoir Rd	035 106
GREGORY ROBERT F & NANCY C	700 Brook Rd	004B158
BROOK ROAD CORPORATION	800 Brook Rd	004B157
BROOK ROAD CORPORATION	820 Brook Rd	004B159
ELAS FLUID PROCESSING CORP	900 Brook Rd	004 035
LORIG ROBERT J & JOHN A	910 Brook Rd	004 056
JING WADE B & MAXWELL JOYCE ANN	1 Brooke Ln	031 004
STENELLA LYNDA	2 Brooke Ln	031 017
ORNETTA ANTHONY G & DOROTHY M	4 Brooke Ln	031 006
SIMON WILLIAM T	5 Brooke Ln	031 016
EWING FRANK W & JANET H	6 Brooke Ln	031 020
MARTIN KIM I	7 Brooke Ln	031 019
PROFESSORI ANTHONY	10 Brooke Ln	031 018
MILLER JOHN & JODY	2516 Butler Pike	030 012
PHIPPS DANE JR	2517 Butler Pike	031 010
LOWALSKI ALEXANDER & CONSTANCE	2519 Butler Pike	031 007
SMALL LAWRENCE & ROSEANNE	2528 Butler Pike	030 015
GALLEO JOHN A JR & DAVID J	2534 Butler Pike	030 016
OWELL DENNIS M & ELIZABETH C	2622 Butler Pike	030 010
VETHERILL ELKINS & HARRIET A	2642 Butler Pike	030 007
RAMBLETT FRANK & KAREN	2700 Butler Pike	030 006
ALACHIOLI JOHN & MARGARET J	2726 Butler Pike	030 005
GREEN SEAN & KATHLEEN M	2740 Butler Pk	030 071
ULMER G EDWARD & MARY E TR	2524 Cold Point Hill Rd	031 021
RENA GASPER & CATHARINE	1080 Conshohocken Rd	022A050
REESE EDWARD JR	2221 Corsons Ln	037 014
EE 49 00 04165 00 7	2261 Corsons Ln	037 024
ORSON GEORGE C & JANE W & LINDA	Corsons Ln	037 008
REESE EDWARD JR	Corsons Ln	037 012
REESE EDWARD JR	Corsons Ln	037 012
MANDATO PHILLIP A & FELIX S	1805 Gallagher Rd	009 068
VB SERVICE CENTER INC	1809 Gallagher Rd	009 010
ONAN GERALD & DORIS	1810 Gallagher Rd	009 043
ROSSUYT MICHAEL F & MAUREEN J	1812 Gallagher Rd	009 044
ESSLER BARRY A & MARGARET C	1819 Gallagher Rd	009 081
LTOMARE PHILIP N & BARBARA	1804 Gravers Rd	009 118
OMANO PASQUALE V & AURORA	1806 Gravers Rd	009 041
IONAHAN JAMES W & MARY E	1808 Gravers Rd	009 042
ENTON A LOUIS	1828 Gravers Rd	009 093
UNEKE JOHN & DOROTHY	1823 Hallowell Rd	035 029
UNEKE JOHN & DOROTHY	1823 Hallowell Rd	035 029
C PAUL J & MARY U TRUSTEES	1921 Hallowell Rd	034 083
ONO STEPHEN C & MARY	1923 Hallowell Rd	034 081
ORDAN MICHAEL H &	2300 Hickory Rd	029 039
ICNEIL HENRY S & LOIS F	2300 Hickory Rd	029 018

CNEIL HENRY S & LOIS F	2300 Hickory Rd	029 005
ROWN NANCY O	2303 Hickory Rd	032 015
EYLER MARY M	2315 Hickory Rd	032 014
EE EDWARD JR	2334 Hickory Rd	029 058
INSON SHARON	2340 Hickory Rd	029 059
URPHY MARTIN J & REBECCA A	2341 Hickory Rd	032 013
TEELE GEORGE A & LUENA	2344 Hickory Rd	029 006
MERY JOAN R	2365 Hickory Rd	032 035
CNEIL HENRY S & LOIS F	Hickory Rd	029 063
CNEIL HENRY S & LOIS F	Hickory Rd	029 060
LYMOUTH HUNT LAND DEV INC	Hickory Rd	032 047
JLTS FREDERIC	451 Irwins Ln	034 077
L R ASSOCIATES LTD	471 Irwins Ln	034 075
AGLIANO FRANK J	1602 Johnson Rd	009 065
ONER JOSEPH P & ANDREA M	1801 Johnson Rd	034 098
JTTER VALERIE C	1803 Johnson Rd	034 094
JTLER ANN	1805 Johnson Rd	034 086
ACCHIONE JANET R	1901 Johnson Rd	034 045
OPER JOHN R & CYNTHIA R	1933 Johnson Rd	034 064
LOPP DAVID B & CAROL L	3067 Jolly Rd	028 038
CKEEVER ANDREW & JULIE M	3069 Jolly Rd	028 028
REIN THOMAS J & MAUREEN C	3071 Jolly Rd	028A002
ENRY MATTHEW E & DONNA A	302 Killybegs Ln	030 032
ONCE ROBERT C SR KARENS	304 Killybegs Ln	030 057
ELI CHEIMER JEFFREY & ANNETTE	305 Killybegs Ln	030 062
CCREERY KEVIN & DEBORAH M	307 Killybegs Ln	030 001
ANLEY SCOTT R & DUVECK KRISTINA	1201 Maple St	001 020
AYALL CHRISTOPHER &	2605 Narcissa Rd	030 011
CCRACKEN STEWART JR	2606 Narcissa Rd	032 008
ARRIS ROBERT W & LINDA J	2607 Narcissa Rd	030 048
ORTI ROBERT J & DIANA L	2607 Narcissa Rd	030 063
EVERGOLE J MACK & RUTH T	2609 Narcissa Rd	030 021
ZOLLOSE JOHN M & CAROL	2627 Narcissa Rd	030 029
CKEOWN JAMES H & MILDRED C &	2630 Narcissa Rd	032 010
OMANO JOSEPH J & RUSSEL MARTHA ANN	2631 Narcissa Rd	030 030
ONE JACK E	2635 Narcissa Rd	030 038
MITH DESIRE M & BRUCE M	2655 Narcissa Rd	030 009
SOUBANOS WILLIAM M &	2701 Narcissa Rd	030 018
RBAN DAVID LEE & KATHLEEN M	2746 Narcissa Rd	029 008
WLER EDWARD D & DAVID & FRANCES	2750 Narcissa Rd	029 009
RIGHTBILL EDGAR J & JOSEPHINE	2753 Narcissa Rd	030 002
AN YUNG & MOON SANG CO	2760 Narcissa Rd	029 056
ONES STEPHEN R & WILDER SUSAN	2762 Narcissa Rd	029 062
OLAN DAVID J III & J DENISE	2764 Narcissa Rd	029 010
ON JAMES F & DOUGHERTY JOYCE	2765 Narcissa Rd	030 036
ARRETT PRITCHARD & JILL B	2770 Narcissa Rd	029E038
ATZ EVAN P	2771 Narcissa Rd	030 052
VAN ROBERT C & HELEN	2775 Narcissa Rd	030 040



HI TUNG & RU LIN KO  
 IONTGOMERY JOHN H SR & CAROL  
 IONTGOMERY ROBERT L & ROBERTA B  
 LIT JOYCE A  
 MILLER LESLEY A  
 EPONARA FRED C  
 QUARRY JOHN S JR & GEORGETTE V  
 OWE JOSEPH X & BRIAN ALAN  
 ANNI JENNIFER L  
 PLYMOUTH PROPERTIES LLC  
 MIDDLE RAYMOND C  
 HUMMEL W THOMAS JR  
 IARRIS PHILIP W & ELLEN M  
 ANDREWS LEE K & AMY L  
 BLACK FREDERICK A IV  
 JUNNINGHAM HARRY J & DELAND SUE  
 ONDEROS ALVARO G & ESTELLE G  
 UKENS WILLIAM E II  
 SAUNTLETT JOHN J & DENISE C  
 IISH EDNA L  
 EWEEES CHARLES  
 IANDRACCHIA DOLORES  
 IORROCKS KEITH J & TINA M  
 IARINELLI JOHN JOS PATRICIA  
 IGCENBERG STEVEN  
 IO BARBARA E  
 IONOFRIO FLORINDA & TAMMYLOU  
 IREMAZA TINA M  
 IAPIZZI SALVATORE & HELEN D  
 IARKINS DENNIS T &  
 IICCONE KATHY  
 IACITELLI ROBERT K &  
 IRIFILETTI ANTHONY D & KAREN  
 ICLARK ELEANOR & HERITAGE BK  
 IABORIAULT GARY  
 IILL STEFAN  
 IELLIGATTI ARMANDO  
 IORDAN BARBARA M/FINDLAY MARJORIE M  
 IOMILL ASSOCIATES LP  
 IASTORIUS VINCENT J & PATRICIA  
 IESANTE ANTHONY & GICONDA  
 ICOMA SALVATORE A & MARY  
 IERVINE CHARLES III & KAYE  
 IUGUSTINE DOLORES H  
 IAIMINA ANGELO & MARY C  
 IALBA ANGELA M & MICHAEL W  
 IAVE JOHN J & PHYLLIS D  
 IOLLETTI CHARLES PHILLIP

2776 Narcissa Rd	029 049
2607A Narcissa Rd	030 044
Narcissa Rd	030 047
108 Nursery Dr	009B023
3013 Oakwood Dr	027A025
121 Plymouth Rd	037 032
125 Plymouth Rd	037 033
129 Plymouth Rd	037 034
133 Plymouth Rd	037 020
137 Plymouth Rd	037 022
139 Plymouth Rd	037 019
141 Plymouth Rd	037 030
143 Plymouth Rd	037 004
149 Plymouth Rd	037 036
151 Plymouth Rd	037 026
153 Plymouth Rd	037 029
155 Plymouth Rd	037 028
201 Plymouth Rd	037 003
454 Plymouth Rd	034 113
455 Plymouth Rd	036 002
823 Plymouth Rd	035 063
827 Plymouth Rd	035 055
841 Plymouth Rd	035 105
843 Plymouth Rd	035 102
845 Plymouth Rd	035 047
851 Plymouth Rd	035B011
865 Plymouth Rd	035 098
867 Plymouth Rd	035 104
875 Plymouth Rd	035 091
879 Plymouth Rd	035 052
883 Plymouth Rd	035 057
975 Plymouth Rd	035 067
979 Plymouth Rd	035 025
981 Plymouth Rd	035 026
1002 Plymouth Rd	035A094
1006 Plymouth Rd	035 032
1012 Plymouth Rd	035 082
Plymouth Rd	037 002
1312 Ridge Pike	009 019
1426 Sandy Hill Rd	012D005
1428 Sandy Hill Rd	012D006
1430 Sandy Hill Rd	012D007
1500 Sandy Hill Rd	012D008
1504 Sandy Hill Rd	012D009
1508 Sandy Hill Rd	012D010
1512 Sandy Hill Rd	012D012
1514 Sandy Hill Rd	012D013
1518 Sandy Hill Rd	012D014

IRABILE ANTHONY & FRANCES	1520 Sandy Hill Rd	012D015
IAZZA ANTHONY & LANA A	1616 Sandy Hill Rd	035 038
ORNETTA JOSEPH&ANN	1620 Sandy Hill Rd	035 095
AD RAD MARVIN	1701 Sandy Hill Rd	035 068
VAN S ALBERT B JR & SUSAN J	1704 Sandy Hill Rd	035 074
HATCHICA GEORGE P	1705 Sandy Hill Rd	035 069
BERGINE DANIEL & SALLY	1707 Sandy Hill Rd	035 070
LYCE S PETER	1708 Sandy Hill Rd	035 035
HIRIANO ANTHONY F & ANNA MARIE	1709 Sandy Hill Rd	035 071
ANELLA SHARON L	1712 Sandy Hill Rd	035 034
MONTELEONE SAMUEL S & DORIS B	1713 Sandy Hill Rd	035 061
VALENTI EVELYN M & JAMES BRESLIN	1715 Sandy Hill Rd	035 041
BREER LYNN T & ALMA A	1718 Sandy Hill Rd	035 088
THOMAS KATHRYN M	1720 Sandy Hill Rd	035 077
AMONICA DANIEL A TRUSTEE	1800 Sandy Hill Rd	035 078
ICAMILLO MICHELANGELO & CARMELL	1802 Sandy Hill Rd	035 119
EMEDIO JOHN F & KATHLEEN M	1806 Sandy Hill Rd	035A093
ANTANO ARMAND A & BEATRICE	1833 Sandy Hill Rd	034 057
RICHARD CLAYTON D III & ILENE D	1835 Sandy Hill Rd	034 118
WOOD THERESA A	1900 Sandy Hill Rd	034 107
MONROE MARY JANE TRUSTEE	1901 Sandy Hill Rd	034 119
ORKOWSKI MICHAEL F & M DOLORES	1902 Sandy Hill Rd	034 037
DEVITIS DEBRA ANN	1903 Sandy Hill Rd	034 120
LOZOWSKI RONALD J & MARY ANN	1904 Sandy Hill Rd	034 053
IN XI JOSEPH A & MARILYN M	1905 Sandy Hill Rd	034 090
BYRNE BRADLEY MICHAEL & LISA ANN	1906 Sandy Hill Rd	034 054
EDNARCK PETER J	1908 Sandy Hill Rd	034 055
GRANESE NEIL J & ROSE J ETAL	1909 Sandy Hill Rd	034 097
ORZELLECA PETER J	1910 Sandy Hill Rd	034 056
GRANESE LAWRENCE & CAROLINE J	1911 Sandy Hill Rd	034 099
HEMANN GREGORY L & PATRICIA B	1912 Sandy Hill Rd	034 089
LUCZEK STANLEY & MARY	1913 Sandy Hill Rd	034 122
CARLSON GILBERT R	1916 Sandy Hill Rd	034 041
APPINE FRANCIS & DAWN G	1917 Sandy Hill Rd	034 038
COOPER JOHN R & CYNTHIA R	1918 Sandy Hill Rd	034 019
COOPER JOHN R & CYNTHIA R	1932 Sandy Hill Rd	034 040
STEINBERG CHARLES & SUSAN C	1008 Thomas Rd	009 057
MACITELLI H CORBETT &	1009 Thomas Rd	009 060
MARSH DANIEL T & CHRISTINE A	1012 Thomas Rd	009 056
AKAL DONALD L & KATHLEEN W	1015 Thomas Rd	009 059
OVEJOY R THOMAS TR	1016 Thomas Rd	009 132
MARCOLINA F WAYNE &	1020 Thomas Rd	009 055
MORTON JANET M	1022 Thomas Rd	009 074
ENNEISEN CREIGE JR & MARJORIE A	116 Township Line Rd	030 055
Y ROBERT H & MARIE	206 Township Line Rd	030 068
ICICCO PATRICK C & KATHLEEN M	208 Township Line Rd	030 023
ELLY JAMES J & GRACIELA R	320 Township Line Rd	030 061
IM JAE SOOL & RYAN OK	340 Township Line Rd	030 060

HUN JACK C	380 Township Line Rd	030 058
OO CHEON HOE & CHUN SIK	408 Township Line Rd	030 035
ARBONE BURIDANO & ROSA	412 Township Line Rd	030 034
JEFFS CHARLES E JR & CAROLYN	502 Township Line Rd	029 012
LBANESE JOSEPH P & PATRICIA M	300 W Twelfth Ave	001 029
RISAFI JOSEPH & SUSAN	2904 Walton Rd	029 026
ISANTO JASPER J JR	2906 Walton Rd	029 047
RAIG FRANK J JR & LORI M	2912 Walton Rd	029 021
HORT STUFF & CO INC	2914 Walton Rd	029 028
IOLES CHARLES & DONNA	2918 Walton Rd	029 016
ENEZIA JOSEPH M	2920 Walton Rd	029 052
ISANTIS NICOLINO & RITA	2921 Walton Rd	028 074
JTERRANTE CHAS JR & VINCENZA	2923 Walton Rd	028 050
PARANGO JOHN A	2925 Walton Rd	028 076
JTERRANTE GASPARE & MARIA	2927 Walton Rd	028 066
OLLINGS GREGORY & VERONICA	2928 Walton Rd	029D007
IRECO DENNIS & KAREN	2929 Walton Rd	028 047
IRANOFF DAVID & KAREN V	2933 Walton Rd	028 073
UCKMANTEL DONALD & LINDA S	3007 Walton Rd	028 048
UCKMANTEL DONALD & LINDA S	3007 Walton Rd	028 048
OTAK RAYMOND J & GENEVIEVE	3009 Walton Rd	028 078
IEBIG THOMAS R &	3011 Walton Rd	028 042
ICCRACKEN STEWART & JOAN	Walton Rd	029 020
ORKOWSKI MICHAEL F & M DOLORES M	903 Whites Rd	034 125
EL FOUR ROBERT J	905 Whites Rd	034 072
EINER STEPHEN D & MICHELE S	906 Whites Rd	034 104
ICCALL JON K & LAURIE C	907 Whites Rd	034 073
HERMAN MICHAEL W & KATHERINE L	909 Whites Rd	034 044
ARELESS ROBERT H & BARBARA J	911 Whites Rd	034 124
IRBANO RONALD	912 Whites Rd	034 071
EBICH MAX & ROSE F	914 Whites Rd	034 093
UTH LAWRENCE A & FLORENCE A	916 Whites Rd	034 101

**Total Number of Systems                      220**

Since October 1, 1991, the Montgomery County Health Department has been acting as the Sewage Enforcement Officer (SEO) for Plymouth Township. Based on conversations with the Health Department, there have been no major complaints of failing septic systems in the Township.

Between the Code Enforcement Office of Plymouth Township and the Montgomery County Department of Health, the remaining onsite disposal systems are inspected when complaints regarding onsite disposal are received.

## 6. Disposal Areas

There are no known disposal areas within Plymouth Township other than to the adjoining wastewater treatment plants.

### B. Unpermitted Collection and Disposal Systems

There are no known Unpermitted Collection and Disposal Systems within Plymouth Township.

### C. Sludge and Septage Generation, Transport and Disposal

The pumping of onsite disposal systems and disposal is done on a private basis. The disposal of sludge from the wastewater treatment plants is handled by facilities not under the control of Plymouth Township and is not included in this report.

## FUTURE GROWTH AND LAND DEVELOPMENT

### A.

#### 1. Existing Development

Exhibit #11 is a map of the existing sanitary sewer system of Plymouth Township. Also shown on this map are the lots lines of all parcels within the boundaries of Plymouth Township. As of March 31, 2005, the records of Plymouth Township indicate that there are 11,342 equivalent dwelling units (EDU's) connected to the sewer systems in Plymouth Township.

	<u>Allowable EDU's</u>	<u>Current EDU's</u>	<u>Available EDU's</u>
West Norriton/Plymouth/ Whitpain J. S. A.	11,273	9,822	1,451
Monroeville Borough Authority	2,189	1,422	767
North Marsh	N/A	89	N/A

# 2005 PLYMOUTH TOWNSHIP ACT 537 UPDATE

In addition to the existing developments within Plymouth Township, there are additional tracts of ground, which are either under the subdivision process or have the capability of being developed in the future. These developments are listed as follows along with the calculation of the proposed EDU's. These tracts of ground are identified on Exhibit #12.

## Service by East Norriton/Plymouth Joint Sewer Authority

Owner	Block/Unit	EDU's
Mano	9/36	32
Mano	9/38	425
Mano	9/39	111
Santo/Cusumano	12D/Numerous	17
Steta	22/18	87
Ilomeno	28/103	2
Neil	29/59	100
ghtbill	30/2	8
ni	32/2	243
itea Hill Associates	32/3	391
hreiber	32/5	1
Neil	32/8	12
Keown	32/10	18
Keown	32/31	2
oche	32/34	2
mouth Investors	32/36	2
own	32/37	4
oper	34/19	13
illie	35/37	10
hon	36/3	62
andywine Tract	37/Numerous	<u>101</u>
	Subtotal	1643

2005 PLYMOUTH TOWNSHIP ACT 537 UPDATE

Service by Conshohocken Borough Authority

mer ino	Block/Unit 2/62	EDU's 44
Jerreda/Chaikin	4/1&2	138
sgow	22A/46	<u>1295</u>
	Subtotal	1477

Service by Whitemarsh Township

mer atherill/Rile	Block/Unit 30/7&10	EDU's 9
	Total	3129

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## 2. Land Use Designations

This section discusses the residential and non-residential zoning designations.

### A. Residential

The Plymouth Township Zoning Ordinance (March 2002) includes eight (8) residential districts, summarized as follows:

#### RESIDENTIAL ZONING SUMMARY

<u>District</u>	<u>Primary Use</u>	<u>Minimum Lot Size</u>
AA	Single Family Dwelling (By Special Exception: Education use; religious use; hospital, golf course, Cemetery, recreational use)	1 Acre
A	Same as AA (Additional Special Exemption: Community Center	20,000 sq. ft. (0.459 Acre)
B	Same as A (By Special Exemption: passenger Station; medical office)	11,250 sq. ft. (0.258 Acre)
C	Same as B (By Special Exemption: club, fraternal Institution)	9,000 sq. ft. (0.207 Acre)
D	Same as C and high-density residential uses (i.e. Single-family semi-detached dwelling, two-family Detached & semi-detached dwellings, town houses) Triplex, quadraplex, parks, beauty parlor, Hospital	Varies (i.e. 5,000 sq. ft. for single family detached dwelling to 2,000 sq. ft. for multiple dwelling
D-1	Duplex, Townhouse	4000 sq. ft. per dwelling duplex 2800 sq. ft. per townhome
RS	Any use permitted in the least restricted Residential district abutting at the particular "residential special" district in question. (By	Lot area not < 4 acres (2,000 sq. ft.

special exemption: apartment house or apartment hotel or use of the same general character) per family)

H-RA Apartment houses; playgrounds Lot area 10 Acre tract

## B. Non-Residential

### a. Zoning

There are sixteen (16) non-residential zoning districts discussed in the Plymouth Township Zoning Ordinance, summarized as follows:

### NON-RESIDENTIAL ZONING SUMMARY

<u>District</u>	<u>Primary Use</u>	<u>Minimum Lot Size</u>
C - Commercial	A building for retail, personal service shop, Restaurant, business or professional office, Bank, municipal use, theater, bowling alley, Automobile sales/service, newspaper publishing/printing, greenhouse, club, etc. (By special exception: gas station, outdoor theater, undertaking, animal hospital, laundry, electric substation)	9,000 sq. ft. 0.207 Acre
SC - Shopping Center	Building/combination of buildings for retail, Restaurant Office, personal service shop, theater, bakery, financial institution, etc. (See Article XI of Zoning Ordinance.)	District: 10 Ac. Lot: 4 Ac
OL – Office Laboratory	Offices, laboratory, bank (by special exception: educational use, hospital).	District: 6 Ac Lot: 3 Ac
IP – Industrial Park	Office, laboratory, restaurant, bank, municipal use, wholesaling, warehousing, manufacturing, etc.	District: 6 Ac Lot: 2 Ac



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LI – Limited Industrial	Manufacturing, fabrication, wholesale trade, food service or catering, printing, public utilities, R&D, warehousing, hotel (special exceptions: 1402 of code). Conditional use - mobile home park.	District: 6 Ac Lot: 2 Ac
HI – Heavy Industrial	Metals manufacturing and casting, fabrication, processing of food, food service or catering, printing, R&D, warehousing (special exceptions: 1502 of code).	District: 6 Ac Lot: 2 Ac
CI – Campus Industrial	Any use permitted in an Office – Laboratory - laboratory District (by special exemption: laboratory, educational use, hospital, some manufacturing).	District: 6 Ac Lot: 3 Ac
HD – Historic	District created to protect portions of the Municipality which have a distinctive Character recalling rich architectural and Historical heritage.	Not applicable
FP – Flood Plain	District created to prevent excessive and Unusual development in areas deemed Undesirable for development due to inherent Natural drainage conditions and topographical Features.	Not applicable
LC – Limited Commercial	Retail, personal services shop, business Office, bank, etc. (by special exception: Restaurant, funeral home)	20,000 sq. ft.
OSR - Open Space	District created "to permit and encourage the retention of open land uses ... for the purpose of providing recreation and the protection of natural scenic beauty". Agricultural, recreational, utilities and community facilities, forestry and wood production, fish hatcheries and wildlife preserves, historic monuments and buildings, single family detached dwelling.	200,000 sq. ft. (not more than 15% of lot area may be occupied by buildings)

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PO - Planned Office Park	Building or combination of buildings for offices, banks, municipal uses, conference centers, restaurants, personal services (for the convenience of tenants), hotel.	District: 40 Ac Lot: 4 Ac
RRR - Resource Recovery	Building or combination of buildings for any use permitted in Heavy Industrial District or or sanitary landfill, trash transfer station, waste recycling facility, incinerator, resource recovery facility, etc. when authorized as conditional use by the Township Council after recommendations of the Planning Agency.	District: 10 Ac. Lot: 4 Ac.
MU – Mixed Use Planned Development	District created “to provide for the combining of offices, stores and shops, hotels and inns in a planned development alongside a major regional highway”.	90 Ac. (tract size)
BP – Business Park	District created to encourage the planned Development of a multi-use center Including limited manufacturing, office and retail uses adjacent to a major highway.	40 Ac. (tract size)
DD - Interchange Development District	District created to encourage a mixture of non-residential uses which can take advantage of office, bank, restaurant, hotel, personal service, conference center, municipal offices.	District: 14 Ac. Lot: 2 Ac. Office 4 Ac. other

### 3. Population and Projections

Plymouth Township population statistics and the number of housing units, based on the 2000 U.S. Census, are summarized as follows:

#### PLYMOUTH TOWNSHIP POPULATION/HOUSING STATISTICS

	<u>POPULATION</u>	<u>TOTAL HOUSING UNITS</u>
1970	16,911	N/A
1980	17,168	6,037
2000	15,958	6,392

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2000

16,045

6,703

Housing Unit increase 1990-2000:

311 units

**NOTE:** The U.S. Census figures illustrate an increase in housing units with a lesser increase in population. This is likely due to a lesser number of persons per family and an aging population.

This results in a density of approximately 2.4 persons per dwelling unit (2.4 persons/d.u.), which will be used for growth projections in the Township. Projected sewage flows will be estimated using the Pennsylvania Department of Resources standard of 100 gal per capita per day (100 gpcd). At 2.4 persons/d.u. and 100 gpcd, the rate of sewage generation per dwelling unit is 240 gallons or 240 gal./d.u. To remain consistent with prior plans 250 gallons will be equal to an equivalent dwelling unit (EDU).

The Montgomery County Planning Commission estimates the future population of Plymouth Township as follows:

	<u>Estimated Population</u>
2005	16,010
2010	15,850
2015	15,540
2020	15,280
2025	15,170

The growth and preservation plan of Plymouth Township prepared by the Montgomery County Planning Commission identifies areas of Plymouth Township which are potentially available for development. Some of these areas have already been identified as subdivision and land developments which have been approved by Plymouth Township. The balance of this area represents the ultimate build out of Plymouth Township.

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The future additional flow to the Conshohocken Borough Authority is estimated to be 416,850 gallons per day. It is anticipated that no additional allocation will be required at Conshohocken Borough. The additional flow to the East Norriton/Plymouth Joint Sewer Authority is estimated to be 474,183 gallons per day. In the expanded East Norriton/Plymouth Joint Sewer Authority Plant, Plymouth Township is requesting 0.5 MGD as a minimum. To allow for redevelopment and rezoning that could occur throughout the Township, a more reasonable request is 1.0 millions gallon per day of additional flow for the ultimate build out of Plymouth Township.

4. Protection of Land and Water Resources

There are no public ground water supplies, service water supplies, recreation of water areas or ground water recharge areas within Plymouth Township. Industrial water use is obtained from the public water system. Regulations of the Pennsylvania Department of Environmental Protection controls the use of and protects wetlands.

5. Sewage Planning for Wastewater Treatment

This Act 537 Update is being done in conjunction with the East Norriton/Plymouth Whitpain Joint Sewer Authority and the other connected Municipalities. The East Norriton/Plymouth Whitpain Joint Sewer Authority is preparing the Act 537 Update for all of the Municipalities dealing with wastewater treatment.

**ALTERNATIVES TO PROVIDE NEW OR IMPROVED WASTEWATER DISPOSAL FACILITIES**

A. Conventional collection, conveyance, treatment, and discharge alternatives

1. Regional Wastewater Treatment

Plymouth Township is currently served by regional wastewater treatment facilities. The largest portion of the Plymouth Township population is served by the East Norriton/Plymouth/Whitpain Joint Sewer Authority's Waste Water Treatment Plant. The Conshohocken Borough Authority serves the southern most portion of Plymouth Township as shown on Exhibit #6.

2. Potential for Extension of Existing Municipal Sewage Facilities

Plymouth Township currently has available 1,451 EDU's in the East Norriton/Plymouth/Whitpain Joint Sewer Authority facilities.

Plymouth Township also has 767 EDU's in the Conshohocken Borough Authority System.

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The waste water collection facilities can be extended to serve any future development within the Township. Historically, this has been done and paid for by the developers themselves. Periodically, the Township has received requests from residents to extend wastewater collection facilities in the areas that currently do not have public sewer. There are currently no known on-site system failures that would require the extension of public facilities. The Oak and Walnut Lane Wastewater Collection System project of 2003 is an example of how the Township cooperates with the residents should there be enough interest in the collection system expansion.

3. Potential for the Continued Use of Existing Municipal Sewage Facilities

- a. Repair. Plymouth Township routinely inspects manholes and sewage collection facilities with TV inspection. Approximately 20% of the system is inspected per year. Any sources of infiltration or structural failure are repaired.
- b. Upgrading. The 1992 Act 537 Report identified areas in Plymouth Township that were currently overloaded or would be overloaded in the future. These areas are routinely inspected for wastewater backup. There are no known areas at the present time that would require an increased pipe size. As development increases in Plymouth Township, the points of connection are evaluated to determine if downstream facilities need to be increased in size.
- c. Reduction of hydraulic or organic loading. This will be discussed by the operators of the waster water treatment plants.
- d. Improved operation and maintenance. Plymouth Township currently has an operating contract for the inspection of all pumping stations on a daily basis. Operation and maintenance of the collection system is done by the Department of Public Works.
- e. Other applicable actions. No other applicable actions are necessary to resolve or abate identified problems.

4. Need for Construction of New Community Sewage Systems

There is no current need for construction of new community sewage systems in Plymouth Township.

5. Repair or Replacement of Collection and Conveyance Systems

Other than the expansion of the Narcissa Road Pumping Station and the relocation of the Narcissa Road Pumping Station Force Main, there are no known repair or replacement needs at the present time. Required repairs found through routine inspection are addressed on an as needed basis.

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6. Innovative/Alternative Methods of Collection and Conveyance

Over 95% of Plymouth Township is currently served by public collection, conveyance and treatment facilities. Innovative or alternative methods is, therefore, not applicable.

B. The Use of Individual Sewage Disposal Systems

Any future development in Plymouth Township would be required to connect to the existing sanitary sewer system and treatment facilities within Plymouth Township. Individual residential spray irrigation systems or other individual sewage disposal systems would not be encouraged.

C. The Use of Small Flow Sewage Treatment Facilities or Package Treatment Facilities.

Any future development in Plymouth Township would be required to connect to the existing sanitary sewer system and treatment facilities within Plymouth Township. Small-flow sewage treatment facilities or package treatment facilities would not be encouraged.

D. The Use of Community Land Disposal Alternatives

Any future development in Plymouth Township would be required to connect to the existing sanitary sewer system and treatment facilities within Plymouth Township. Community Land Disposal Alternatives would not be encouraged.

E. The Use of Retaining Tank Alternatives on a Temporary or Permanent Basis

Should an on-site disposal system fail, the first attempt would be to connect the facility to the public system within Plymouth Township or construct an alternative on-site disposal system. The use of retaining tanks, due to costs, would be last alternative. Plymouth Township would only permit retaining tanks to be used on a temporary basis until public facilities can be extended.

F. Sewage Management Programs

1. Municipal Ownership and Control Over the Operation and Maintenance of Individual On Lot Sewage Disposal Systems or Other Traditionally Non-Municipal Treatment Facilities.

As indicated in this report, there are only a limited amount of on-site disposal systems in Plymouth Township. Any complaints of an on-site system malfunction is directed to the Montgomery County Health Department with a backup by Plymouth Township. Operation and maintenance of individual on-site disposal systems is not performed by Plymouth Township.

2. Inspection of Sewage Disposal Systems

Plymouth Township inspects its sanitary sewer collection and conveyance facilities on a routine basis. Other areas with a past history root problems are inspected on an annual basis.

3. Inspection of Septic and Aerobic Treatment Plants

Plymouth Township does not inspect septic or aerobic treatment tanks.

4. Repair, Replacement or Upgrading of Malfunctioning On Lot Sewage Disposal Systems

If a malfunctioning on lot sewage system is identified, the repair, replacement or upgrade of this facility is regulated by the Montgomery County Department of Health.

5. Establishment of Joint Municipal Sewage Management Programs

Plymouth Township is a member of the East Norriton/Plymouth/Whitpain Joint Sewer Authority. It is a customer of the Conshohocken Borough Authority. Individual residents are customers of the Borough of Norristown and Whitemarsh Township.

6. Bonding for Operation and Maintenance of Non-Municipal Facilities

Plymouth Township does not require bonding for individual on lot disposal systems. There are no other non-municipal facilities that would require such escrows.

G. Non-Structural Comprehensive Planning Alternatives

Plymouth Township is in the process of updating its comprehensive plan. Exhibit #12 shows land within Plymouth Township, which has been approved for development or is currently under construction. It is anticipated that 1,524 EDU's will be generated by this development.

Land for new construction in Plymouth Township is extremely limited. Redevelopment is more likely in the future. The Montgomery County Planning Commission anticipates a loss of population in Plymouth Township over the next 20 years. With this in mind, non-structural comprehensive planning to meet existing and future sewage disposal needs is not applicable.

H. No Action Alternatives

Plymouth Township currently serves over 95% of the population within the boundaries of Plymouth Township including non-residential uses. The Township has the capacity to handle the ultimate build out of the Township in collection and conveyance facilities. As development and redevelopment occurs, these users will be required to make necessary extensions or upgrades to the facilities. Plymouth Township will continue to operate and maintain the facilities and will provide extensions in areas currently served by on-site disposal should the need arise or residents request service. Historically these extensions are paid for by the Township and reimbursed by the users.

## EVALUATION OF ALTERNATIVES

### Technical Feasibility of Alternatives

All of the alternative evaluated in this Act 537 update are as follows:

- a. Conventional collection, conveyance treatment and discharge.
- b. Individual sewage disposal systems.
- c. Small flow sewage treatment facilities.
- d. Community land disposal alternatives.
- e. Retaining Tanks.
- f. Sewage management programs.
- g. Non-structural comprehensive planning alternatives.
- h. No action.

Of the eight alternatives presented in Chapter 5 of this report, only conventional collection, conveyance, treatment and discharge needs to be evaluated. Since Plymouth Township is almost fully developed and have committed to this alternative, the other alternative are not applicable in Plymouth Township case.

1. The Plymouth Township Collection and Conveyance System has been constructed and developed and approved under Section 4 and 5 of the Clean Streams Law and Section 208 of the Clean Water Act.
  2. The Plymouth Township Collection and Conveyance System is consistent with the Waste Load Management Reports (Chapter 64).
  3. The Plymouth Township Collection and Conveyance System has been developed under Chapter II of the Clean Water Act.
  4. The continued use of the Plymouth Township Collection and Conveyance System is consistent with the comprehensive of Plymouth Township, developed under the Pennsylvania Municipalities Planning Code.
  5. Water quality standards and waste water treatment is being handled by other authorities and not Plymouth Township.
  6. The state water plans are being developed by other authorities.
  7. Plymouth Township is almost completely developed and the protection of prime agricultural soils is not applicable.
  8. The continued use of the Plymouth Township Collection and Conveyance System is consistent with the Sawmill Run Stormwater Management Plan.
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9. The continued use or expansion of the Plymouth Township Collection and Conveyance System has been built with DEP Permits and any future expansion would require permits for any encroachment on wetlands.
10. Protection of rare, endangered or threatened plant and animal species. Since no construction is proposed, the need for identification of rare, endangered or threatened plant and animal species, by the Department of Conservation and Natural Resources, Bureau of Forestry is not applicable.
11. Protection of the Pennsylvania Historical and Museum Commission. Since no construction is proposed, the need for identification of historical and archaeological resources, by the Department of Conservation and Natural Resources, Bureau of Historical Sites is not applicable.
- B. There are no known inconsistencies identified in section VIA above.
- C. The evaluation of water quality standards, effluent limitations or other technical, legislative or legal requirements are being handled by other authorities.
- D. Since no construction is proposed, cost estimates are not applicable.
- E. Since no construction is proposed, funding sources is not applicable.
- F. Since no construction is proposed, phasing is not applicable.
- G. Since no construction is proposed, evaluation of administrative organizations and legal authorities is not necessary.

## **INSTITUTIONAL EVALUATION**

- A. Analysis of all existing wastewater treatment authorities.

This information will be provided by others.

- B. Analysis and description of the various institutional alternatives necessary to implement the proposed technical alternatives.

This will be provided by others.

- C. Administrative and legal activities to be completed and adopted to ensure the implementation of the recommended alternatives.

Any extension of the Plymouth Township Wastewater Collection and Conveyance System required by developers, will be paid for by developers. If residents request the extension of the sanitary sewer system to eliminate on-site disposal systems, the Plymouth Township Council will fund the project with reimbursement by the residents.

D. Institutional alternative.

This will be discussed by other authorities.

**. JUSTIFICATION FOR SELECTED TECHNICAL & INSTITUTIONAL ALTERNATIVES**

- A. Identify the technical wastewater disposal alternative which best meets the wastewater treatment needs of each study area of the municipality.

Plymouth Township proposes to continue to convey wastewater to East Norriton/Plymouth/Whitpain Joint Sewer Authority, Conshohocken Borough Authority, Whitemarsh Township and the Borough of Norristown.

- B. Capital financing plan.

Since no construction is proposed, financing is not necessary.

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## **APPENDIX D**

# **OVERALL WASTEWATER COLLECTION AND CONVEYANCE SYSTEM PLAN**